



PRODUCT CLASSIFICATION LIST

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MACHINES CURRENTLY IN THE PRODUCT LINE

29	GSD	3145	DPD	3717	GSD	5421	GSD
59	GSD	3148	DPD	3732	DPD	5422	GSD
83	GSD	3158	DPD	3735	COM	5424	COM
88	GSD	3168	DPD	3736	DPD	5425	DPD
129	GSD	3203	DPD	3741	GSD	5444	GSD
403	GSD	3210	DPD	3742	GSD	5447	GSD
419	GSD	3211	DPD	3747	GSD	5448	GSD
519	GSD	3213	DPD	3760	DPD	5471	GSD
534	GSD	3215	DPD	3762	DPD	5486	GSD
557	GSD	3216	DPD	3767	COM	5496	COM
803	COM	3251	DPD	3771	DPD	7770	DPD
1001	COM	3255	DPD	3774	DPD (*)	8101	DPD
1031	DPD	3258	DPD	3775	DPD (*)	8130	DPD
1032	DPD	3262 -		3776	DPD	8140	DPD
1033	DPD	1	DPD	3777	DPD	8775	DPD
1034	DPD	A1,B1	GSD	3780	COM	8809	DPD
1035	COM	3271	COM	3781	COM		
1230	COM	3272	COM	3782	DPD		
1231	COM	3274	COM	3784	DPD		
1232	COM	3275	COM	3791	DPD (*)		
1255	COM	3276	COM	3792	DPD		
1260	COM	3277	COM	3793	DPD		
1282	COM	3278 -		3800	DPD		
1287	DPD(*)	1,2,3,4	COM	3803	DPD		
1288	DPD	2A	DPD	3811	DPD		
1402	DPD	3284	COM	3830	DPD		
1403	COM	3286	COM	3838	DPD		
1404	DPD	3287	COM	3842	DPD		
1416	COM	3288	COM	3845	COM		
1419	COM	3289 -		3846	COM		
1442	COM	1,2,3	COM	3851	DPD		
1443	COM(*)	4	DPD	3863	COM		
1445	DPD	3310	DPD	3864	COM		
2152	COM	3330	DPD	3865	COM		
2222	GSD	3333	DPD	3872	COM		
2250	COM	3340	COM	3874	COM		
2305	DPD	3344	COM	3875	COM		
2401	COM	3345	DPD	3880	DPD		
2415	COM	3350	DPD	3881	COM		
2420	DPD	3370 -		3886	COM		
2501	COM	A1,B1	DPD	3890	DPD		
2502	COM	A11,B11	GSD	3895	DPD		
2520	COM	3410	COM	3896	DPD		
2540	DPD	3411	COM	4331	DPD		
2560	COM	3420	DPD	4341	DPD		
2671	DPD	3501	DPD	4953	GSD		
2701	DPD	3504	DPD	4955	GSD		
2711	COM	3505	DPD	4959	GSD		
2740	COM	3521	DPD	4962	GSD		
2741	COM	3525	DPD	4964	GSD		
2791	COM	3540	DPD	4973	GSD		
2792	COM	3601	COM	4974	GSD		
2793	COM	3602	COM	4978	GSD		
2796	COM	3603	COM	4979	GSD		
2797	COM	3604	COM	4982	GSD		
2798	COM	3606	COM	4987	GSD		
2803	DPD	3608	COM	4990	GSD		
2804	DPD	3610	COM	4997	GSD		
2816	DPD	3611	COM (*)	4999	GSD		
2821	DPD	3612	COM	5010	GSD		
2822	DPD	3614	COM	5012	GSD		
2835	DPD	3615	COM	5013	GSD		
2840	COM	3616	COM	5014	GSD		
2860	DPD	3618	COM	5022	GSD		
2870	DPD	3624	COM	5024	GSD		
2880	DPD	3631	DPD	5026	GSD		
3017	DPD	3632	DPD	5028	GSD		
3027	DPD	3641	DPD	5029	GSD		
3031	DPD	3642	DPD	5100	GSD		
3032	DPD	3643	DPD	5103	GSD		
3033	DPD	3644	DPD	5106	GSD		
3036	DPD	3645	DPD	5110	GSD		
3037	DPD	3646	DPD	5114	GSD		
3038	DPD	3647	DPD	5203	COM		
3041	DPD	3651	DPD	5211	GSD		
3042	DPD	3653	DPD	5213	COM		
3046	DPD	3657	DPD	5231	GSD		
3047	DPD	3659	DPD	5234	GSD		
3052	DPD	3661	DPD	5235	GSD		
3056	DPD	3663	DPD	5251	GSD		
3058	DPD	3666	DPD	5256	GSD		
3062	DPD	3667	DPD	5320	GSD		
3066	DPD(*)	3669	DPD	5340	GSD		
3067	DPD(*)	3683	DPD	5404	GSD		
3068	DPD	3684	DPD	5406	GSD		
3115	DPD	3704	DPD	5408	GSD		
3125	DPD	3705	DPD	5410	GSD		
3135	DPD	3713	COM	5412	GSD		
3138	DPD	3715	GSD	5415	GSD		

(*) Certain models of these machine types have not been withdrawn from marketing.



PRODUCT CLASSIFICATION LIST

All products are normally classified based on standard Sales Manual description of purpose. I/O or terminal products exclusive to one division which attach to selected products of the other division through RPQ's are considered Common (for those uses only).
Withdrawn 7XXX machines are not shown. Machine types indicated by an (*) have certain models which have not been withdrawn from marketing. Refer to applicable machine page for models that have been withdrawn from marketing.

MACHINES WHICH ARE WITHDRAWN FROM MARKETING

01 GSD	513 GSD	743 DPD	1071 COM	1828 GSD	3773 DPD
10 GSD	514 GSD	744 DPD	1072 COM	1851 GSD	3774 DPD (*)
11 GSD	516 GSD	745 DPD	1073 COM	1854 GSD	3775 DPD (*)
12 GSD	517 GSD	746 DPD	1074 COM	1856 GSD	3791 DPD (*)
13 COM	518 GSD	747 DPD	1075 COM	2020 GSD	4872 COM
15 GSD	520 GSD	748 DPD	1076 COM	2022 DPD	5275 DPD
16 GSD	521 GSD	752 DPD	1077 COM	2025 DPD	5445 GSD
24 GSD	522 GSD	753 DPD	1078 COM	2030 DPD	5475 GSD
26 GSD	523 GSD	754 DPD	1081 COM	2040 DPD	6405 GSD
27 GSD	524 GSD	755 DPD	1082 COM	2044 DPD	6420 GSD
28 GSD	526 GSD	756 DPD	1083 COM	2050 DPD	6422 GSD
31 GSD	527 GSD	757 DPD	1084 COM	2060 DPD	6425 GSD
36 GSD	528 GSD	758 DPD	1092 COM	2065 DPD	6426 GSD
37 COM	529 GSD	759 DPD	1093 DPD	2067 DPD	6428 GSD
41 COM	533 GSD	760 DPD	1094 COM	2070 DPD	6454 GSD
43 GSD	534 GSD	766 DPD	1131 GSD	2075 DPD	6455 GSD
44 GSD	535 GSD	767 DPD	1132 GSD	2085 DPD	
46 GSD	536 GSD	771 COM	1133 GSD	2091 DPD	
47 GSD	537 GSD	772 COM	1134 GSD	2095 DPD	
50 GSD	541 GSD	774 COM	1201 COM	2150 DPD	
51 GSD	542 GSD	775 COM	1202 COM	2167 DPD	
52 GSD	543 DPD	780 DPD	1203 COM	2203 COM	
53 COM	544 GSD	781 DPD	1210 COM	2213 COM	
54 COM	545 GSD	782 DPD	1219 COM	2260 COM	
55 GSD	548 GSD	801 COM	1220 COM	2265 COM	
56 GSD	549 GSD	802 COM	1221 COM	2280 DPD	
58 GSD	550 GSD	805 COM	1241 DPD	2282 DPD	
60 COM	551 GSD	808 COM	1259 COM	2285 DPD	
63 GSD	552 GSD	812 COM	1285 DPD	2301 DPD	
64 COM	556 GSD	813 COM	1287 DPD(*)	2302 DPD	
65 COM	557 GSD	814 COM	1301 DPD	2303 DPD	
66 COM	601 GSD	815 COM	1311 COM	2310 GSD	
67 COM	602 GSD	816 COM	1351 DPD	2311 COM	
68 COM	603 GSD	817 COM	1352 DPD	2312 COM	
71 COM	604 GSD	818 COM	1355 DPD	2313 COM	
72 GSD	605 GSD	819 COM	1361 DPD	2314 COM	
75 GSD	607 GSD	820 COM	1364 DPD	2318 COM	
76 COM	608 GSD	824 GSD	1365 DPD	2319 DPD	
77 GSD	609 GSD	826 GSD	1367 DPD	2321 DPD	
78 COM	610 GSD	834 GSD	1401 DPD	2360 DPD	
79 COM	614 GSD	836 GSD	1405 DPD	2361 DPD	
80 GSD	630 GSD	838 DPD	1406 DPD	2362 DPD	
81 COM	631 GSD	850 COM	1407 DPD	2365 DPD	
82 GSD	634 GSD	854 COM	1408 DPD	2385 DPD	
84 GSD	635 GSD	856 GSD	1409 DPD	2395 DPD	
85 GSD	636 GSD	857 COM	1411 DPD	2402 COM	
86 GSD	637 GSD	858 GSD	1412 DPD	2403 DPD	
87 GSD	638 GSD	863 GSD	1414 DPD	2404 DPD	
89 GSD	641 GSD	865 GSD	1415 DPD	2495 DPD	
90 GSD	645 GSD	866 GSD	1418 DPD	2596 DPD	
91 GSD	648 GSD	867 GSD	1421 DPD	2680 DPD	
92 GSD	649 GSD	868 GSD	1428 DPD	2702 DPD	
93 COM	650 DPD	869 GSD	1441 DPD	2703 DPD	
94 COM	652 DPD	884 COM	1443 COM(*)	2712 DPD	
101 GSD	653 DPD	939 GSD	1444 COM	2715 DPD	
106 COM	654 DPD	941 GSD	1446 DPD	2721 DPD	
108 GSD	655 DPD	942 GSD	1447 DPD	2730 DPD	
188 GSD	701 DPD	953 COM	1448 DPD	2760 DPD	
285 GSD	702 DPD	954 GSD	1461 DPD	2772 COM	
298 COM	704 DPD	955 COM	1462 DPD	2780 COM	
305 DPD	705 DPD	957 COM	1501 DPD	2795 COM	
323 DPD	706 DPD	961 GSD	1502 DPD	2820 DPD	
340 DPD	709 DPD	962 GSD	1505 DPD	2802 DPD	
350 DPD	711 DPD	963 COM	1510 DPD	2814 DPD	
355 DPD	712 DPD	964 DPD	1512 DPD	2826 DPD	
357 COM	714 DPD	966 COM	1518 DPD	2841 COM	
358 COM	716 DPD	972 GSD	1620 GSD	2844 DPD	
360 COM	717 DPD	973 GSD	1621 GSD	2845 DPD	
361 COM	719 DPD	1009 COM	1622 COM	2846 DPD	
370 DPD	720 DPD	1011 COM	1623 GSD	2848 COM	
372 COM	721 DPD	1012 DPD	1624 GSD	3060 DPD	
373 COM	722 DPD	1013 DPD	1625 GSD	3066 DPD(*)	
374 COM	726 DPD	1014 COM	1626 GSD	3067 DPD(*)	
376 COM	727 DPD	1015 COM	1627 GSD	3080 DPD	
380 DPD	729 DPD	1016 COM	1711 GSD	3085 DPD	
381 DPD	730 DPD	1017 COM	1712 GSD	3086 DPD	
382 DPD	731 DPD	1018 COM	1713 GSD	3155 DPD	
402 GSD	732 DPD	1026 DPD	1714 GSD	3165 DPD	
404 GSD	733 DPD	1051 COM	1715 GSD	3195 DPD	
405 GSD	734 DPD	1052 COM	1716 GSD	3275 COM (*)	
407 GSD	735 DPD	1053 COM	1717 GSD	3346 DPD	
408 GSD	736 DPD	1054 COM	1801 GSD	3360 DPD	
409 GSD	737 DPD	1055 COM	1802 GSD	3611 COM (*)	
412 GSD	738 DPD	1056 COM	1803 GSD	3671 DPD	
416 GSD	739 DPD	1057 COM	1810 GSD	3672 DPD	
418 GSD	740 DPD	1058 COM	1816 GSD	3673 DPD	
501 COM	741 DPD	1061 DPD	1826 GSD	3674 DPD	
512 COM	742 DPD	1062 DPD	1827 GSD	3707 GSD	

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MACHINE TYPES/MODELS WHICH HAVE BEEN DISCONTINUED FROM LEASE AND RENTAL AGREEMENTS AND WITHDRAWN FROM IBM MAINTENANCE AGREEMENTS

1	Mechanical Punch	704	Central Processing Unit (704)
12	Duplicating Punch	705	Central Processing Unit (705)
15	Motor Drive Punch	709	Central Processing Unit (709)
16	Motor Drive Duplicating Punch	712	Card Reader
27	Card Proof Punch	714	Card Reader
28	Printing Card Proof Punch	717	Printer
31	Alpha Duplicating Punch	719	Printer
36	Alpha Printing Punch	720	Printer
44	Tape Control Punch	722	Card Punch
51	Mechanical Verifier	726	Magnetic Tape Unit
52	Verifier	727	Magnetic Tape Unit
55	Verifier	730	Printer
58	Card Typewriter	731	Magnetic Drum Storage
70	Vertical Sorter	732	Magnetic Drum
71	Vertical Sorter	733	Magnetic Drum
72	Collator	734	Magnetic Drum
75	Sorter	735	Print Control
76	Searching Sorter	736	Power Supply
78	Stencil Collator	737	Magnetic Core Storage
79	Stencil Printing Collator	738	Magnetic Core Storage
81	Stencil Sorter	739	Additional Core Storage
86	Coupon Sorter	740	CRT Recorder
89	Collator	741	Power Supply
90	Accounting Machine	742	Power Unit
91	Accounting Machine	743	Power Supply
92	Accounting Machine	744	Power Unit
93	Accounting Machine	745	Power Unit
94	Automatic Checking Machine	746	Power Distribution Unit
106	Coupon Statistical Machine	747	Tape Data Selector PS
210	Electric Verifier	748	Data Synchronizer
211	Accounting Machine	752	Tape Control
212	Accounting Machine	753	Tape Control
285	Numerical Accounting Machine	754	Tape Control
298	Numerical Accounting Machine	755	Tape Control
305	RAMAC	756	Control Unit
323	RAMAC Card Punch	757	Printer Control
340	RAMAC Power Unit	758	Card Punch Control
350	RAMAC Disk	759	Card Reader Control
355	Disk Storage	760	Control & Storage
370	RAMAC Printer	766	Data Synchronizer
380	RAMAC Console	767	Data Synchronizer
381	RAMAC Printer	771	Card/Tape Converter
404	Accounting Machine	774	Tape Data Selector
405	Accounting Machine	775	Record Storage Unit
409	Accounting Machine	776	Sp EDPM
412	Alphabetic Accounting Machine	777	Tape Record Coordinator
416	Accounting Machine	781	Console
417	Numerical Accounting Machine	782	Console Control Unit
418	Numerical Accounting Machine	786	Stretch
501	Numbering Gangpunch	801	Proof Machine
512	Reproducer	805	Test Scoring Machine
515	Interpreting Reproducing Punch	838	Inquiry Station
516	Duplicating Summary Punch	850	Stencil Cutter
518	Reproducer	856	Card-A-Type
520	Computing Punch	857	Document Writer
522	Duplicating Summary Punch	858	Control Unit
527	Electronic Calculator Punch	861	Stencil Charger
528	Accumulating Reproducer	863	Arithmetic Unit
529	Electronic Calculating Punch	865	Output Typewriter
533	Card/Read Punch	868	Transmitting Typewriter
535	Card Read Punch	869	Typewriter
537	Card/Read Punch	884	Typewriter Tape Punch
542	Reader Punch	919	Comparing Bill Feed
543	Card Reader	920	Bill Feed
544	Card Punch	921	Carriage
550	Interpreter	933	Carbon Ribbon Feed
551	Interpreter	942	Electronic Storage Unit
554	Interpreter	953	Multiline Posting Machine
556	Interpreter	964	Auxiliary Printing Tape Punch
601	Multiplier	966	Code Comparing Unit
603	Electronic Multiplier	973	Keyboard
605	Electronic Calculator	1301-1	Disk Storage Unit
607	Calculator	1405-1	Disk Storage
608	Transistor Calculator	1405-2	Disk Storage
610	Calculator	1411	Central Processing Unit (1410)
623	Calculating Punch	1601	Central Processing Unit
625	Calculating Punch	1602	Auxiliary Processing Unit
626	Calculating Punch	1603	Input Output Processing Unit
644	Calculating Punch	1604	Output Control Unit
648	Paper Tape Punch for 632 System	1605	Terminal and Multiplex Unit
649	Paper Tape Reader for 632 System	1606	Process Operators Console
650	Console (650 System)	1608	Remote Printing Station
651	RPQ Machine	1780	Space Plotter
652	Control Unit	1783	Uptime 1500 Reader
653	Storage Unit	1789	Rixon Modem
654	Auxiliary Alphabetic Unit	1902-3	Paper Tape Output (RPQ)
655	Power Unit	1903-13	Paper Tape Reader (RPQ)
701	Central Processing Unit (701 System)	1905-22	Self Check Numbering Unit
702	Central Processing Unit (702)	1912-17	Teletype to Card



MACHINE TYPES/MODELS WHICH HAVE BEEN DISCONTINUED FROM LEASE AND RENTAL AGREEMENTS AND WITHDRAWN FROM IBM MAINTENANCE AGREEMENTS

1912-22 Teletype to Card
1912-46 Buffer (RPQ)
1922-1 Tape Adapter (RPQ)
1922-2 Tape Adapter (RPQ)
1922-4 Tape Adapter (RPQ)
1922-19 Tape Adapter (RPQ)
1924-12 Control Unit (RPQ)
1924-38 Punch Control
1924-44 Buffer Punch
1924-63 Printer Control Unit
1924-66 Control Unit (RPQ)
1924-67 Control Unit (RPQ)
1927-1 Inquiry Station (RPQ)
1933-2 Reader Punch
1939-1 Serial Card Reader
1940-7 Serial Printer (RPQ)
1944-5 Card Transceiver - 5 Channel
1944-6 Terminal Control Unit
1944-9 Reader Mark Sense (RPQ)
1945-3 Magnetic Tape Transfer Unit
1946-4 Card Terminal (RPQ)
1973-1 Card Read Punch (RPQ)
1974-2 Data Transmission Processor
1991-1 Sequence Keyboard (RPQ)
1998-9 SMS Cube
1998-13 Storage Power Control Unit
1998-14 Drum Power Converter
1998-15 Drum Control Unit
1998-16 D.C. C.E. Console
1998-17 Drum
1998-18 Drum Air Compressor
1998-19 Drum Air Receiver
1998-24 Impulse Readout Master Clock (RPQ)
1998-28 Clock
1998-33 Card Proof Punch
1998-34 Card Proof Punch
1998-43 Data Channel Repeater
2911-6 Switch
2976-3 Transmission Control Unit
2976-4 Printer Keyboard
2976-5 Signal Converter
2983-1 Supervisor Data Capture Unit
2989-11 Basic Counter Unit
7100 Central Processing Unit
7101 Central Processing Unit (7030)
7105 Central Processing Unit (7072 System)
7152 Stretch Console
7230-1 Input Output Multiplexer
7256-1 Photo Store Unit
7262 Console
7266-1 Lexical Processor
7275-2 Toll Rating Interface
7286-3 Channel Direct Data
7286-5 Channel Direct Data & LCM
7293 Power Supply & Power Control
7294-1 Tape Independent Power
7300 Disk Storage
7404 Graphic Output Unit
7503 Card Reader
7553 Card Punch
7605 Disk Storage Control
7612 Disk Synchronizer & Storage
7613 Tape Control
7614 Card Reader Control
7615 Card Punch Control
7616 Printer Control
7619 Exchange
7620 Channel
7622 Signal Control
7623 Console Central
7634 Graphic Control Unit
7701 Tape Transmission Terminal
7710 Data Communication Unit
7711 Data Communication Unit
7803 Power Distribution
7900 Inquiry Station
7951 Stretch
7952 Stretch
7956 Stretch
7957 Stretch
7958 Stretch
7959 Stretch
9809 Disk Channel
9827 Drum Channel
9828 Drum Channel CE Console
9907 Disk Channel CE Console

PLANNED DATES FOR DISCONTINUANCE OF LEASE AND RENTAL MACHINE TYPES/MODELS AND WITHDRAWAL OF IBM
 MAINTENANCE AGREEMENT SERVICE

December 31, 1979

63 Card to Tape Punch
 711 Card Reader
 716 Printer
 721 Card Punch
 780 CRT Display
 1014 Remote Inquiry Unit
 1414 Input/Output Synchronizer
 1415 Console
 2280 Film Recorder
 7102 Arithmetic & Logical Unit (7080 System)
 7104 High Speed Processor (7074 System)
 7106 Processing Unit (7040 System)
 7107 Processing Unit (7044 System)
 7108 Instruction Processing Unit (7090 System)
 7109 Arithmetic Sequence Unit
 7110 Instruction Processing Unit (7094 System)
 7111 Instruction Processing Unit (7094-II System)
 7114 Processing Unit (7010 System)
 7150 Console Control Unit
 7151 Console Control Unit
 7153 Console Control Unit
 7301 Core Storage
 7302 Core Storage
 7305 Central Storage & Input/Output Control
 7320 Drum Storage
 7400 Printer
 7500 Card Reader
 7501 Console Card Reader
 7502 Console Card Reader
 7550 Card Punch
 7600 Input/Output Control
 7601 Arithmetic & Program Control (7070 System)
 7602 Core Storage Control
 7603 Input/Output Synchronizer
 7604 Tape Control
 7606 Multiplexor
 7607 Data Channel
 7608 Power Converter
 7617 Data Channel Console
 7618 Power Control
 7621 Tape Control
 7631 File Control
 7640 Hypertape Control
 7741 Programmable Transmission Control Unit
 7750 Programmed Transmission Control
 7802 Power Converter
 7804 Power Unit
 7904 Data Channel
 7907 Data Channel
 7908 Data Channel
 7909 Data Channel

April 30, 1980

67 Telegraph Signal Unit
 80 Sorter
 101 Statistical Sorter
 116 Numeric Duplicating Punch
 131 Alpha Duplicating Punch
 143 Tape Controlled Card Punch
 155 Numeric Verifier
 156 Alpha Verifier
 163 Card Controlled Tape Punch
 408 Accounting Machine
 426 Accounting Machine
 450 Accounting Machine
 513 Reproducing Punch
 517 Gang Summary Punch
 549 Ticket Converter
 628 Calculating Punch
 1202 Utility Inscrubber
 1502 Station Control
 1506 Audio Unit
 1510 Instruction Display
 1512 Image Projector
 1518 Typewriter
 1903-2 Paper Tape Reader
 1924-77 Control Unit
 1925-22 Switch
 1925-25 Switch
 1935-1 Ticket Reader
 7702 Magnetic Tape Transmission Terminal
 7765 Paper Tape to Magnetic Tape Converter

December 31, 1980

2712 Remote Multiplexer

April 30, 1981

353 Disk Storage Unit
 521 Electronic Calculating Punch
 541 Card Read Punch
 604 Electronic Calculator
 609 Calculator
 728 Magnetic Tape Unit
 729 Magnetic Tape Unit
 1011 Paper Tape Reader
 1026 Transmission Control Unit
 1241 Bank Processing Unit
 1301-2 Disk Storage Unit
 1301-11 Disk Storage Unit
 1301-12 Disk Storage Unit
 1301-21 Disk Storage Unit
 1301-22 Disk Storage Unit
 1302 Disk Storage Unit
 1311 Disk Storage Drive
 1401 Processing Unit
 1402 Card Reader Punch
 1403-1 Printer
 1403-4 Printer
 1406 Storage Unit
 1407 Console
 1409 Console Auxiliary Unit
 1421 Bank Transit Machine
 1441 Processing Unit
 1442-1 Card Reader Punch
 1442-2 Card Reader Punch
 1442-3 Card Reader
 1442-4 Card Reader
 1443-3 Printer
 1443-4 Printer
 1444 Card Punch
 1445-1 Printer
 1446 Printer
 1447 Console
 1448 Transmission Control Unit
 1461 Input Output Control
 1462 Printer
 1620 Central Processing Unit
 1621 Paper Tape Reader
 1622 Card Read Punch
 1623 Core Storage
 1624 Magnetic Tape Punch
 1625 Core Storage
 1626 Plotter Control
 1711 Data Converter
 1712 Multiplexer and Terminal
 1713 Manual Entry Unit
 1714 Sense Switch Unit
 1715 Digital Display Unit
 1716 Output Printer Control
 1717 Output Printer
 1791 Digital Input Control
 1792 Terminal Box for Control System
 1793 File Storage Unit
 1794 Additional Process Input Output
 1795 RPQ
 1796 Adapter Unit
 1797 Terminal Box for Control System
 1798 Data Control Unit
 1979-1 Reader Control Unit (RPQ)
 7155 Console
 7330 Magnetic Tape Unit
 7335 Magnetic Tape Unit
 7340 Hypertape
 7641 Hypertape Control

February 28, 1982

151 Verifier
 1003 SABRE Terminal
 1004 SABRE Controller
 1009 Data Transmission Unit
 1013 Communicating Reader Punch
 1924-35 RPQ SW1-1403
 1924-43 RPQ Controller for 2d 1403
 1976-4 RPQ Data Communication Terminal
 1998-29 RPQ Clock Input
 2596 Card Read Punch
 2902-1 RPQ Communication Controller
 2947-4 RPQ Check Collection Controller
 2962-1 RPQ Display Controller
 2973-7 RPQ Two Channel Switch
 2989-10 RPQ Real Time Recorder
 3671-1 Shared Terminal Controller

PLANNED DATES FOR DISCONTINUANCE OF LEASE AND RENTAL MACHINE TYPES/MODELS AND WITHDRAWAL OF IBM
MAINTENANCE AGREEMENT SERVICE

7473-2 RPQ Display Terminal
7772 Audio Response Unit

April 30, 1982

812 Automatic Production Recorder
813 Portable Keyboard
814 Remote Control Unit
815 Automatic Typewriter
816 Remote Automatic Typewriter
817 Card Reader
818 Remote Shaft Position Converter
819 Printing Card Punch
820 Time Punch
1081 Data Acquisition Control
1082 Card Reader
1083 Remote Control
1084 Sampler Reader
1210 Reader Sorter
1259 Reader Sorter
1412 Magnetic Character Reader

June 30, 1982

2321 Data Cell Drive

February 28, 1983

50 Magnetic Data Inscrber
108 Card Proving Machine
602 Calculating Punch
614 Typewriter for 632 and 634 Systems
630 Calculating Unit for 632 System
631 Calculating Unit for 632 System
634 Calculating Unit for 632 System
635 Calculating Unit for 632 System
636 Calculating Unit for 632 and 633 Systems
637 Calculating Unit for 632 and 633 Systems
638 Calculating Unit for 632 System
641 Card Reader for 632 System
645 Card Reader for 632 System
824 Typewriter Card Punch
826 Typewriter Punch Printer
867 Output Typewriter for 108
1980-14,15 RPQ Selective Tape Listing Printer
2495 Tape to Card Reader
2911-14 RPQ Communication Switching Unit
4872 Modem
6405 Accounting Machine for 6400 System
6410 Accounting Machine for 6400 System
6420 Accounting Machine for 6400 System
6422 Automatic Ledger Feed for 6400 System
6424 Card Punch for 6400 System
6425 Magnetic Ledger Unit for 6400 System
6426 Card Punch for 6400 System
6428 Card Reader for 6400 System
6454 Paper Tape Reader for 6400 System
6455 Paper Tape Punch for 6400 System

February 29, 1984

834 Control Unit (Non Printing)
836 Control Unit (Printing)
866 Non Transmitting Typewriter
961 Tape Punch (8 track)
962 Tape Punch (5 track)
972 Auxiliary Keyboard
1960-10 RPQ Special Reader
1960-20 RPQ Special Processing Unit
2946-1 RPQ Terminal Control Unit

TYPICAL MACHINE DESCRIPTION

The format used throughout the "Machines" section of the sales manual has been designed to give the reader, in "Highlights" form, as much information as possible in as few words as possible. A bracket to the right of any entry indicates a change or addition. A study of the points covered in this typical machine description will show where and how various types of information are covered in each description.

- (1) **Purpose** -- a capsule description of the machine's major functions.
- (2) **Models** -- capsule description of major differences in available models.
- (3) **Model Changes** -- there are three categories: Field Installable, Not Recommended for Field Installation, or Available at Time of Manufacture Only. For a rental machine, the new monthly availability charge (see "Prices" below) is effective the day following installation of the model change.
- (4) **Highlights** -- capsule comments on sales advantages and functional operations.
- (5) **Limitation(s)** (not shown in this example) -- only those which apply to the machine itself ... limitations for Special Features appear in "Special Features" descriptions.
- (6) **Prerequisite(s)** -- other machines, special features, or "Specify" items required for installation of the machine ... usually related to system components.
- (7) **Bibliography** -- base number only. Consult the current appropriate system bibliography for listing of all available manuals pertaining to the machine on that system.
- (8) **Specify** -- this section lists items which will be furnished at no additional charge when specified on initial machine order for plant installation at time of manufacture. Each item is identified by a name and a four-digit (9XXX) number preceded by a number sign (#). 9XXX numbers are also used as detailed specifications for certain special features listed in "Special Features" descriptions.
- (9) **Prices** (for base machine)

Metering -- indicates the type of meter on a Systems Plan "A" machine.

Useful Life Category --

- (10) **Special Features** -- listed here are descriptions of the special features which can be added to the base machine ... each description covers in capsule form the additional function(s) supplied by the feature.

Installation -- there are three categories for installation of special features. Field Installable, Not Recommended for Field Installation, or Available at Time of Manufacture Only.

Prerequisite(s) -- other machines, special features, or "Specify" items required for installation of the feature.

(11) Special Feature Prices

MAC -- the monthly availability charge, exclusive of applicable taxes, for the special feature. (SUC = Single Use Charge ... item remains property of IBM)

Purchase -- the purchase price, exclusive of applicable taxes, for the special feature. Also see FIC, below.

MMMC -- the Minimum Monthly Maintenance Charge for the special feature on a purchased machine on a Maintenance Agreement. (T&M = Time and Material)

FIC -- the service charge for field installation of the special feature on a purchased machine. PO under this heading means plant installation only (cannot be field installed). **Note:** FIC does not apply to new machine types announced after June 1, 1970.

Note: Under any of the above headings, NC = No Charge.

3782 CARD ATTACHMENT UNIT

- (1) **Purpose:** Used to attach the 2502 Card Reader mdl A1 or A2 to a 3774, 3775 or 3776 Communication Terminal, or to attach a 3521 Card Punch to a 3771, 3774, 3775 or 3776 Communication Terminal.

- (2) **Model 1** Attaches a 3521 Card Punch.

Model 2 Attaches a 2502 Card Reader mdl A1 or A2.

- (3) **Model Changes:** Not recommended for field installation.

- (4) **Highlights:** The unit provides power and attachment circuits and serves as a stand for mounting the card machine.

- (6) **PREREQUISITES:**

Model 1 -- requires 3782/3521 Card Punch Attachment (#8150) on the 3771, 3774, 3775 or 3776 and a 3521 Card Punch.

Model 2 -- requires a 3782/2502 Card Reader Attachment (#8149) on the 3774, 3775 or 3776 and a 2502 Card Reader mdl A1 or A2. The following specify features are required on the 2502: #9901 for 115 VAC, and #9046 for white color.

- (7) **Bibliography:** GC20-0001

- (8) **Specify:** [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

- [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

- [3] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual - Physical Planning, GA27-3006.

(9) Prices:	Mdl	MAC	ETP	Purchase	MMMC
3782	1	\$ 41	\$ 35	\$ 1,400	\$1.50
	2	59	50	2,000	1.00

Rental Plan: B
Warranty: B

Purchase Option: 60%
Useful Life Category: 2

Maintenance: D
Per Call: 1

(10) SPECIAL FEATURES

OPTICAL MARK READ (#5455). [Model 2 only] Required when the attached 2502 is equipped with Optical Mark Read (#5450). **Maximum:** One. **Limitation:** Refer to 2502 writeup for feature description and card limitations. **Field Installation:** Yes.

(11) Special Feature Prices:	MAC	ETP	Purchase	MMMC
Optical Mark Read	#5455	\$ 25	\$ 21	\$ 840 \$ 1

On some pages in the "Machines" section, there is a "Codes" heading under which will be shown SIU and ID. SIU = System Identification Unit; ID = Identity Code.

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INDEX OF MACHINES
ACCESSORIES

See M 10000 pages

AUXILIARY PROCESSOR

3838 Array Processor

BANKING EQUIPMENT

 803 Proof Machine
 1255 Magnetic Character Reader
 1419 Magnetic Character Reader
 3890 Document Processor
 3895 Document Reader/Inscriber
 3896 Tape-Document Converter
 (also see 1060)

COMMUNICATION SYSTEM (3790)

 2741 Communication Terminal
 3277 Display Station
 3284 Printer
 3286 Printer
 3287 Printer
 3288 Line Printer
 3411 Mag Tape Unit & Control - mdl 1
 3760 Dual Key Entry Station - mdl 1, 2
 3760 Key Entry Station - mdl 3
 3762 Key Entry Station
 3791 Controller
 3792 Auxiliary Control Unit
 3793 Keyboard-Printer

DATA COLLECTION SYSTEM (1030)

 1031 Input Station
 1032 Digital Time Unit
 1033 Printer
 1034 Card Punch
 1035 Badge Reader

DATA COMMUNICATION SYSTEM (2790)

 1035 Badge Reader
 2715 Transmission Control Unit
 2740 Communication Terminal - mdl 1
 2791 Area Station
 2792 Remote Communications Controller
 2793 Area Station
 2796 Data Entry Unit
 2797 Data Entry Unit
 2798 Guidance Display Unit

DATA COMMUNICATION SYSTEM (3770)

 2502 Card Reader
 3203 Printer
 3501 Card Reader
 3521 Card Punch
 3771 Communication Terminal
 3774 Communication Terminal
 3775 Communication Terminal
 3776 Communication Terminal
 3777 Communication Terminal
 3782 Card Attachment Unit
 3784 Line Printer

DATA PROCESSING SYSTEMS

See next page

DATA TRANSMISSION SYSTEM (1001)

 1001 Data Transmission Unit
 7770 Audio Response Unit

DATA TRANSMISSION UNITS

 2740 Communication Terminal
 3767 Communication Terminal

DISTRIBUTED OFFICE COMMUNICATION SYSTEM (3730)

 3277 Display Station
 3284 Printer
 3286 Printer
 3287 Printer
 3288 Line Printer
 3411 Magnetic Tape and Control
 3732 Text Display Station
 3736 Printer
 3791 Controller
 3793 Keyboard-Printer

FINANCE COMMUNICATION SYSTEM (3600) RETAIL STORE SYSTEM (3650)

 3601 Finance Communication Controller
 3602 Finance Communication Controller
 3603 Terminal Attachment Unit
 3604 Keyboard Display
 3606 Financial Services Terminal
 3608 Printing Financial Services Terminal
 3610 Document Printer
 3611 Passbook Printer
 3612 Passbook and Document Printer
 3614 Consumer Transaction Facility
 3615 Administrative Terminal Printer
 3616 Passbook and Document Printer
 3618 Administrative Line Printer
 3624 Consumer Transaction Facility

 3275 Display Station Model 3
 3284 Printer Model 3
 3651 Store Controller Model 50
 3653 Point of Sale Terminal
 3657 Ticket Unit
 3659 Remote Communications Unit
 3784 Line Printer

SUPERMARKET SYSTEM (3660)

 3651 Store Controller Model 60
 3661 Store Controller
 3663 Supermarket Terminal Mdl 1, 2, 3
 3666 Checkout Scanner
 3669 Store Communications Unit

PROGRAMMABLE STORE SYSTEM (3680)

 3683 Point of Sale Terminal
 3684 Point of Sale - Control Unit

PUNCHED CARD EQUIPMENT
KEY PUNCHES

5496 Data Recorder

OPTICAL READER CARD PUNCH

1282 Optical Reader Card Punch

INFORMATION SYSTEM (8100)

 2741 Communications Terminal
 3276 Control Unit Display Station Mdl 11-14
 3277 Display Station
 3278 Display Station
 3284 Printer Model 1, 2
 3286 Printer Model 1, 2
 3287 Printer
 3288 Line Printer
 3289 Line Printer
 3601 Finance Communication Controller
 3602 Finance Communication Controller
 3631 Plant Communications Controller
 3632 Plant Communications Controller
 3641 Reporting Terminal
 3642 Encoder Printer
 3643 Keyboard Display
 3644 Automatic Data Unit
 3645 Printer
 3646 Scanner Control
 3767 Communication Terminal
 3842 Loop Control Unit
 8101 Storage and I/O Unit
 8130 Processor
 8140 Processor
 8775 Display Terminal
 8809 Magnetic Tape Unit

INFORMATION DISPLAY SYSTEM (3270)

 3271 Control Unit
 3272 Control Unit
 3274 Control Unit
 3275 Display Station
 3276 Control Unit Display Station
 3277 Display Station
 3278 Display Station
 3284 Printer
 3286 Printer
 3287 Printer
 3288 Line Printer
 3289 Line Printer

MODEMS

 3872 Modem
 3874 Modem
 3875 Modem

OPTICAL MARK READERS

 1230 Optical Mark Scoring Reader
 1232 Optical Mark Page Reader

PLANT COMMUNICATION SYSTEM (3630)

 3631 Plant Communication Controller
 3632 Plant Communication Controller
 3641 Reporting Terminal
 3642 Encoder Printer
 3643 Keyboard Display
 3644 Automatic Data Unit
 3645 Printer
 3646 Scanner Control
 3647 Time and Attendance Terminal
 3842 Loop Control Unit

PROGRAMMABLE STORE SYSTEM (3650)

 3275 Display Station Model 3
 3284 Printer Model 3
 3651 Store Controller Model 25/75
 3653 Point of Sale Terminal
 3657 Ticket Unit
 3659 Store Communications Unit
 3663 Supermarket Terminal Mdl 1P, 2, 3P
 3666 Checkout Scanner
 3667 Checkout Scanner
 3669 Store Communications Unit
 3784 Printer



DATA PROCESSING SYSTEMS

PROCESSORS

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
3031 Processor									X							
3032 Processor										X						
3033 Processor											X					
3115 Processing Unit	X															
3125 Processing Unit		X														
3135 Processing Unit			X													
3138 Processing Unit				X												
3145 Processing Unit					X											
3148 Processing Unit						X										
3158 Processing Unit							X									
3168 Processing Unit								X								
4331 Processor												X				
4341 Processor													X			
8130/8140 Processor															X	
5010 Processor Module																X

PROCESSOR EXTENSION

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
3052 Attached Processing Unit							X									
3058 Multisystem Unit							X									
3062 Attached Processing Unit								X								
3068 Multisystem Communication Unit								X								
3838 Array Processor					X	X	X	X	X	X	X	X	X			
8101 Storage and Input/Output Unit															X	

PROCESSOR STORAGE

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
3345 Main Storage Frame					X††											

CONSOLE UNITS

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
2250 Display Unit -- mdl 1								X	X	X	X					
3036 Console									X	X	X					
3056 Remote System Console							X									
3066 System Console -- mdl 2, 3								X								
3210 Console Printer-Keyboard -- mdl 1			X		X											
3210 Console Printer-Keyboard -- mdl 2					X											
3213 Console Printer							X									
3215 Console Printer-Keyboard			X		X											
3270 Units (see Systems pages)			X	X	X	X	X	X	X	X	X					
3278 Display Printer -- mdl 2A												X	X			
5213 Printer -- mdl 1	X	X														

DATA CHANNEL UNITS

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
2860 Selector Channel								X								
2870 Multiplexer Channel								X								
2880 Block Multiplexer Channel								X								

X -- Attachment is made by standard equipment.

** Through 2150 only.
†† Not S/370 mdl 145-3.

DATA PROCESSING SYSTEMS

INPUT/OUTPUT UNITS (including control units)

AUDIO RESPONSE UNITS

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
7770 Audio Response Unit	X	X	X	X	X	X	X	X	X	X	X	X	X			

CARD READERS/PUNCHES

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
1442 Card Reader Punch -- mdl N1	X	X	X	X	X	X	X	X	X	X	X	X	X			
1442 Card Punch -- mdl N2	X	X	X	X	X	X	X	X	X	X	X	X	X			
2501 Card Reader -- mdl B1, B2	X	X	X	X	X	X	X	X	X	X	X	X	X			
2520 Card Read Punch -- mdl B1	X	X	X	X	X	X	X	X	X	X	X	X	X			
2520 Card Punch -- mdl B2, B3	X	X	X	X	X	X	X	X	X	X	X	X	X			
2540 Card Read Punch	X	X	X	X	X	X	X	X	X	X	X	X	X			
2560 Multi-function Card Mach -- A1	X	X														
2560 Multi-function Card Mach -- A2	X															
2821 Control Unit -- mdl 1, 5	X	X	X	X	X	X	X	X	X	X	X	X	X			
2821 Control Unit -- mdl 4						††										
2821 Control Unit -- mdl 6	X	X	X	X	X	X	X	X	X	X	X	X	X			
3504 Card Reader		X														
3505 Card Reader	X	X	X	X	X	X	X	X	X	X	X	X	X			
3525 Card Punch	X	X	X	X	X	X	X	X	X	X	X	X	X			
5424 Mult Function Card Unit												X				
5425 Multi-function Card Unit	X	X														
5496 Data Recorder																

COMMUNICATIONS CONTROLLER

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
3791 Controller		X	X	X	X	X	X	X	X	X	X	X	X			

COMMUNICATIONS TERMINALS

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
2740 Communications Terminal	X	X	X	X	X	X	X	X	X	X	X	X	X			
2741 Communications Terminal	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
3735 Programmable Buffered Terminal	X	X	X	X	X	X	X	X	X	-X	X	X	X			
3767 Communication Terminal	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
3771 Communication Terminal	X	X	X	X	X	X	X	X	X	X	X	X	X			
3774 Communication Terminal -- P1, P2	X	X	X	X	X	X	X	X	X	X	X	X	X			
3775 Communication Terminal -- P1	X	X	X	X	X	X	X	X	X	X	X	X	X			
3776 Communication Terminal	X	X	X	X	X	X	X	X	X	X	X	X	X			
3777 Communication Terminal	X	X	X	X	X	X	X	X	X	X	X	X	X			
3780 Data Communications Terminal	X	X	X	X	X	X	X	X	X	X	X	X	X			

DATA ADAPTER UNITS

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
5026 Enclosure																X

DATA TRANSMISSION MULTIPLXR

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
2701 Data Adapter Unit	X	X	X	X	X	X	X	X	X	X	X	X	X			
2711 Line Adapter Unit	X	X	X	X	X	X	X	X	X	X	X	X	X			
3704 Communications Controller	(1)	(1)	X	X	X	X	X	X	X	X	X	X	X		X	
3705 Communications Controller	(1)	(1)	X	X	X	X	X	X	X	X	X	X	X		X	

(1) See the 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

†† Not 145-3 models.

DISPLAY UNITS

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
2250 Display Unit -- mdl 1, 3	X	X	X	X	X	X	X	X	X	X	X	X	X			
2798 Guidance Display Unit																X
2840 Display Control	X	X	X	X	X	X	X	X	X	X	X	X	X			
3271 Control Unit	X	X	X	X								X				
3272 Control Unit	X	X	X	X	X	X	X	X	X	X	X	X	X			
3274 Control Unit -- mdl 1A, 1B	X	X	X	X	X	X	X	X	X	X	X	X	X			
3274 Control Unit -- mdl 1C	X	X	X	X								X				
3275 Display Station	X	X	X	X								X				
3276 Control Unit Display Station	X	X	X	X								X				X
3277 Display Station	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3278 Display Station	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3284 Printer	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3286 Printer	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3287 Printer	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3288 Line Printer	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3289 Line Printer	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8775 Display Terminal																X

DIRECT ACCESS STORAGE

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
1316 Disk Pack			X	X	X	X	X	X	X	X	X	X	X			
2316 Disk Pack			X	X	X	X	X	X	X	X	X	X	X			
3310 Direct Access Storage												X				
3330 Disk Storage -- mdl 1, 2		X	X	X	X	X	X	X	X	X	X			X		
3330 Disk Storage -- mdl 11			X	X	X	X	X	X	X	X	X			X		
3333 Disk Storage and Control -- mdl 1		X	X	X	X	X	X	X	X	X	X			X		
3333 Disk Storage and Control -- mdl 11			X	X	X	X	X	X	X	X	X			X		
3336 Disk Pack		X	X	X	X	X	X	X	X	X	X			X		
3340 Disk Storage and Control	X	X	X	X	X	X	X	X	X	X	X	X	X			
3344 Direct Access Storage			X	X	X	X	X	X	X	X	X			X		
3348 Data Module	X	X	X	X	X	X	X	X	X	X	X	X	X			
3350 Direct Access Storage			X	X	X	X	X	X	X	X	X			X		
3370 Direct Access Storage												X	X			
3830 Storage Control -- mdl 2			X	X	X	X	X	X	X	X	X			X		
3830 Storage Control -- mdl 3					X	X	X	X	X	X	X			X		
3851 Mass Storage Facility					X	X	X	X	X	X	X			X		
3880 Storage Control														X		
5022 Disk Storage Module																X
5440 Disk Cartridge																X

DISKETTE INPUT/OUTPUT UNIT

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
3540 Diskette Input/Output Unit	X	X	X	X	X	X	X	X	X	X	X	X	X			

DRUM/FIXED HEAD STORAGES

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
2305 Fixed Head Storage -- mdl 1								X		X	X					
2305 Fixed Head Storage -- mdl 2					X	X	X	X	X	X	X			X		
2835 Storage Control -- mdl 1								X		X	X					
2835 Storage Control -- mdl 2					X	X	X	X	X	X	X			X		

MAGNETIC CHARACTER READERS

	S/370											4300 Processor		8100	S/7	
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341			
1255 Magnetic Character Reader	X	X	X	X	X	X	X		X			X	X			
1419 Magnetic Character Reader	X	X	X	X	X	X	X	X	X	X	X	X	X			
3890 Document Processor			X	X	X	X	X	X	X	X	X	X	X			



DATA PROCESSING SYSTEMS

MAGNETIC TAPE UNITS

	S/370											4300 Processor		8100	S/7		
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341				
2401 Magnetic Tape Unit -- mdl 1, 2, 3			X	X	X	X	X	X	X	X	X	X	X				
2401 Mag. Tape Unit -- mdl 4, 5, 6, 8			X	X	X	X	X	X	X	X	X	X	X				
2415 Magnetic Tape Unit and Cntrl			X	X	X	X	X	N	X				X	X			
2420 Magnetic Tape Unit -- mdl 5, 7			X	X	X	X	X	X	X	X	X	X	X	X			
2803 Tape Control			X	X	X	X	X	X	X	X	X	X	X	X			
2804 Tape Control			X	X	X	X	X	X	X	X	X	X	X	X			
2816 Switching Unit			X	X	X	X	X	X	X	X	X	X	X	X			
3410 Magnetic Tape Unit	X	X	X	X	X	X	X	X					X	X			
3411 Magnetic Tape Unit and Cntrl	X	X	X	X	X	X	X	X					X	X			
3420 Magnetic Tape Unit -- 3, 5	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
3420 Magnetic Tape Unit -- mdl 7			X	X	X	X	X	X	X	X	X	X	X	X			
3420 Magnetic Tape Unit -- mdl 4, 6, 8			X	X	X	X	X	X	X	X	X	X	X	X			
3803 Tape Control -- mdl 1, 2			X	X	X	X	X	X	X	X	X	X	X	X			
3803 Tape Control -- mdl 3	X	X															
8809 Magnetic Tape Unit												X				X	

OPTICAL READERS

	S/370											4300 Processor		8100	S/7		
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341				
1287 Optical Reader -- mdl 1, 3			X	X	X	X	X	X	X	X	X	X	X				
1287 Optical Reader -- mdl 5	X	X	X	X	X	X	X	X	X	X	X	X	X				
1288 Optical Page Reader			X	X	X	X	X	X	X	X	X	X	X				
3881 Optical Mark Reader	X	X	X	X	X	X	X		X	X		X	X				
3886 Optical Character Reader	X	X	X	X	X	X	X	X	X	X	X	X	X				

PAPER TAPE UNITS

	S/370											4300 Processor		8100	S/7		
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341				
2671 Paper Tape Reader	X	X	X	X	X	X	X		X	X		X	X				
2822 Paper Tape Reader Control	X	X	X	X	X	X	X		X	X		X	X				
5028 Operator Station																	X

PRINTERS

	S/370											4300 Processor		8100	S/7		
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341				
1403 Printer -- mdl 2, 7, N1	X	X	X	X	X	X	X	X	X	X	X	X	X				
1404 Printer			†														
1416 Interchangeable Train Cartridge	X	X	X	X	X	X	X	X	X	X	X	X	X				
1443 Printer -- mdl N1	X	X	X	X	X	X	X	X	X	X	X	X	X				
1445 Printer -- mdl N1			†		††												
2821 Control Unit -- mdl 1,2,3,5	X	X	X	X	X	X	X	X	X	X	X	X	X				
2821 Control Unit -- mdl 4			†														
3203 Printer mdl 1, 2	X	X															
3203 Printer mdl 4				X		X											
3203 Printer mdl 5												X	X				
3211 Printer			X	X	X	X	X	X	X	X	X	X	X				
3216 Interchangeable Train Cartridge			X	X	X	X	X	X	X	X	X	X	X				
3262 Line Printer												X					
3287 Line Printer				X		X									X	X	
3289 Line Printer mdl 3																X	
3289 Line Printer mdl 4												X					
3800 Printing Subsystem				X	X	X	X	X	X	X	X	X	X				
3811 Printing Control Unit			X	X	X	X	X	X	X	X	X	X	X				
5203 Printer	X																

* Model 4 only on 4331.
 † Not 135-3 models.
 †† Not 145-3 models.

DATA PROCESSING SYSTEMS

PRINTER-KEYBOARDS

	S/370											4300 Processor		8100	S/7		
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341				
3210 Console Printer-Keyboard mdl 1			X		X												
3210 Console Printer-Keyboard mdl 2					X												
3215 Console Printer Keyboard			X		X												
5028 Operator Station																	X

POWER UNITS

	S/370											4300 Processor		8100	S/7		
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341				
3017 Power Unit									X								
3027 Power & Coolant Dist Unit										X							
3037 Power & Coolant Dist. Unit											X						
3046 Power Unit			X	X	X*												
3047 Power Unit					X	X											
3067 Power & Coolant Dist Unit mdl 2, 5							X										

READER/INSCRIBER

	S/370											4300 Processor		8100	S/7		
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341				
3895 Document Reader/Inscriber	X	X	X	X	X	X	X	X	X	X	X	X	X				

SENSOR BASED MODULES

	S/370											4300 Processor		8100	S/7		
	115	125	135	138	145	148	158	168	3031	3032	3033	4331	4341				
5012 Multifunction Module																	X
5013 Digital Input/Output Module																	X
5014 Analog Input Module																	X

* Not 3145-3 models.
** Through 2150 only ... Not 3145-3 models.



LIST OF SPECIAL FEATURES/MODEL UPGRADES FOR PURCHASED MACHINES FOR WHICH THE REPLACED PARTS BECOME THE PROPERTY OF IBM

Machine Type	Special Feature Additions	Model Conversions		Machine Type	Special Feature Additions	Model Conversions	
		From	To			From	To
3032	7850			8101		A10	A11, A13
3033	7850	*U4,6,8; or *M4,6,8; or *A4,6,8	U12,16; M12,16; A12,16	8130		A11	A13
3145		GE GFD H HG I	H2, HG2, I2, IH2, J2 H2, HG2, I2, IH2, J2 H2, HG2, I2, IH2, J2 I2, IH2, J2 IH2, J2	8140		A21 A22 A23	A22, A23, A24 A23, A24 A24
3155			Conversion to 155 II			A31 A32 A33 A34	A32, A33, A34 A33, A34 A34
3158	2151 7220					A41 A42 A43	A42, A43, A44 A43, A44 A44
3158-8	2151 7220					A51 A52 A53	A52, A53, A54 A53, A54 A54
3165			Conversion to 165 II				
3168	7220						
3168-3	7220	U31 U32 U33 U34 U35 U36 U37 U38 A31 A32 A33 A34 A35 A36 A37 A38	A31 thru A38 A32 thru A38 A33 thru A38 A34 thru A38 A35 thru A38 A36 thru A38 A37, A38 A38 M31 thru M38 M32 thru M38 M33 thru M38 M34 thru M38 M35 thru M38 M36 thru M38 M37, M38 M38				
3344		B2	B2F				
3350		A2 B2 C2	A2F B2F C2F				
3601		2A 2B 3A	2B, 3A, 3B 3B 3B				
3602		1A	1B				
3631		1A	1B				
3632		1A	1B				
3651		A25 B25 A50 A60 A50 B50 A60 B60 A75 C75	B25, A75, B75 B75 B50 B60 A75, B75 B75 A75, B75 B75 B75 B75 D75				
3653		1	1P				
3661		1	2				
3663	3880	1 3	1P 3P				
3684		1	2				
3776		1 2 3	2, 3, 4 4 4				
3777		1 2	2, 3 3				
3791	3220 3221	1A	1B				
3803		1	2				
3830-1, 2	2151	2	3				

* Single dense storage technology models (U4, U6, U8; M4, M6, M8; A4, A6, A8).

NOTE: This list does not include standard machine types below 3000, RPQ machine types, special feature or model conversion RPQs, or GSD "Exclusive" machines.



LIST OF NON-FIELD INSTALLABLE SPECIAL FEATURES/MODEL CONVERSIONS

Machine Type-Model	SPECIAL FEATURES		MODEL CONVERSIONS		Machine Type-Model	SPECIAL FEATURES		MODEL CONVERSIONS	
	Not Recommended for Field Installation	At Time of Manufacture Only	Not Recommended for Field Installation	At Time of Manufacture Only		Not Recommended for Field Installation	At Time of Manufacture Only	Not Recommended for Field Installation	At Time of Manufacture Only
357		1450		All	3066-3	7127			
372		7578		*		7128			
729				*	3067-1	4520			
803				*		7117			
1001		1222				7118			
1031				All	3067-2	4525			
1032				All		7127			
1033		9509				7128			
1201				*	3067-3	4525			
1231				All		7127			
1255				*		7128			
1287		5370		All	3067-5	4525			
1288		5370			3115-2			3115-2 to 3115-0	
1401				*	3135-3			3135-3 to 3135	
1403		5381		*				3145-2 to 3145-0	
1419		3610 3791 3795			3145	4650		3145-3 to 3145-2	
1442				*	3145-3	4650		3158-3 to 3158	
1443		5567 5568 5569		*	3158-3				
2250				All	3165	4520			
2305				All		7117			
2401				*		7118			
2402				*	3168	4525			
2403				*		7127			
2415				*		7128			
2420				All	3168-3	4525		3168-3 to 3168	
2501				*		7127			
2520				*		7128			
2540		4151			3203				*
2560		1575		*	3210			1 to 2 2 to 1	
2701		7695 7696			3271-11, 12		1200		
2740		3401 3402		All	3274	8801			*
2791				*	3275-2		3440		
2792				All	3275-3				All
2803		8100		All	3275-12		1200		
2804				All	3276	1068			
2821		7945 8100		*	3277				All
2835				All	3278-2A		4631 4632 4633 4634	2A	
2860				All					*
2880			All		3284				*
3062	4525				3286				*
3066-1	4520 7117 7118 7119				3289			*	*
					3310				*
					3330				*
					3340				All
3066-2	4525 7127 7128 7129				3345			*	*
					3350				*
					3360			All	

* See applicable machine page for model conversion/feature restrictions.

NOTE: This list does not include GSD "Exclusive" machines or RPQ machines.



LIST OF NON-FIELD INSTALLABLE SPECIAL FEATURES/MODEL CONVERSIONS

Machine Type-Model	SPECIAL FEATURES		MODEL CONVERSIONS		Machine Type-Model	SPECIAL FEATURES		MODEL CONVERSIONS	
	Not Recommended for Field Installation	At Time of Manufacture Only	Not Recommended for Field Installation	At Time of Manufacture Only		Not Recommended for Field Installation	At Time of Manufacture Only	Not Recommended for Field Installation	At Time of Manufacture Only
3370				All	3762				
3420-3,5,7		3550 6407					1310 3805 4660 5100		
3504	3921				3767	1201			
3505	3921				3771	1201			
3525	1421				3773	1201			
3601				*		4660			
3602	1010 1011				3774	1201 4660			
3603	6352			All	3775	1201 3551 4660			
3604-1	4661 4663			All					
3604-2,3,4	4771 4772 4773 4774			All	3776 3777	1201 1201			
					3782			All	
3604-5, 6			5 to 6	All, except 5 to 6	3791 3803				*
3604-7				All	3830			*	
3606				All	3845				All
3608		5454		All	3846				All
3610-1,2,3		6900 6901 6903 6904		All	3872 3881		3602		*
					5424	6510			
3610-4				All	5496	3666	7801 7850		
3611		6900 6901 6903 6904	All						
3612		6900 6901 6903 6904		All					
3614				All					
3615				All					
3616		8701							
3618	3550 3860								
3624	6301* 6302* 7820* 7950			All					
3632	1010 1011								
3641	5781 5801 5802	4652 4653		All					
3642				All					
3643		4772 4774		All					
3647		1501 3850							
3651				*					
3653	4990								
3659				All					
3663	3425 3451 5330			*					
3741				*					
3760		6660		All					

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* See applicable machine page for model conversion/feature restrictions.
NOTE: This list does not include GSD "Exclusive" machines or RPQ machines.



357 INPUT STATION

[The 357 Models 4, 5 and 6 are no longer available]

Purpose: Badge and/or serial card reader input unit for a 357 Data Collection System.

Model 4 -- a badge reader which operates as an independent input station. Reads identification badges (size of a 22-column stub card) prepunched in IBM code with a maximum of ten numeric digits. Badges, which are punched on a 13 Badge Punch, are inserted and removed manually. Badge read-out is automatic with insertion of badge. See Manual GA21-9028 for badge specifications. Badges can be purchased from outside vendors or produced with commercially available laminating equipment.

Model 5 -- a serial card reader. Standard unscored 80-column cards are inserted and removed manually, one at a time. Reads numbers, letters, IBM special characters, and instruction codes. Blank columns are not recognized and are automatically skipped over. Provision is made for attaching a 372 Manual Entry or 374 Cartridge Reader.

Model 6 -- a combination serial card reader and badge reader. Information pertaining to mdl 4 and 5 applies to mdl 6. This model, in conjunction with a 372 or 374, provides a means of loading the station with variable source data as well as fixed employee and job data prior to transmission to the output unit. An instruction code in the card shifts transmission of data from card to badge. A separate column must be used in the card being read for each column of the badge which is to be read out, unless Badge Read-out (#1450), a special feature, is installed. See Manual GA21-9028 for badge specifications.

Model Changes: Cannot be made in the field.

PREREQUISITE: A 358 Input Control Unit ... each 358 controls up to twenty 357s, in any combination of models.

Badge Gauge: Available at no charge for use with mdl 4 and 6 to check width and thickness of badges ...

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
357	4	\$ 39	\$ 884	\$ 4.00
	5	46	1,155	13.00
	6	63	1,505	18.00

Plan Offering: Plan B Purchase Option: 50% Maintenance: C
Warranty: B Per Call: 1

SPECIAL FEATURES

BADGE READ-OUT (#1450). [Model 6 only] [Plant installation only] Enables the mdl 6 to read a badge only. When both a card and a badge are to be read, a single instruction code in the card shifts transmission to the badge reader for automatic read-out of the badge. Patch panel wiring in the mdl 6 controls read-out. A "Badge" position on the mode switch provides automatic badge read-out upon insertion of a badge.

CONTROLLED RESET (#2287). [Model 5, 6 only] Manually operated switch in non-reset position permits retention for re-reading of any fixed combination of the badge, 372 Manual Entry setting, or the data cartridge. Operator set-up time at a terminal is reduced when entering a series of transactions with common data in the manual entry, data cartridge and/or badge.

Special Feature Prices:		MAC/ MRC	Purchase	MMMC	FIC
Badge Read-out	#1450	\$ 5	\$ 238	\$2.00	PO
Controlled Reset	2287	2	95	NC	\$ 32

358 INPUT CONTROL UNIT

[The 358 Model 1 is no longer available]

Purpose: Links up to twenty 357 Input Stations with one 24/26* Card Punch in a 357 Data Collection System.

Highlights: Analyzes instruction codes in input cards and controls card reading. Instruction codes are wired through a transaction selector in the 358 to format control. Data, in the form of DC pulses, is transmitted over multi-conductor cable and punched at the rate of approximately 18 characters/second on the 26, or 20 characters/second on the 24.

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

SPECIFY: Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
358	1	\$ 86	\$2,450	\$ 25

Plan Offering: Plan B Purchase Option: 50% Maintenance: C
Warranty: B Per Call: 1

360 CLOCK READ-OUT CONTROL

[The 360 Model 1 is no longer available]

Purpose: Controls read-out of time from a 361 Read-out Clock to up to thirty-five card punches in a 357 Data Collection System ... see "Limitation" below.

Highlights: Has connections for two 361s ... a toggle switch permits switching from one clock to the other.

Limitation: Time can be provided for simultaneous output to up to ten 24/26*s ... for applications such as attendance recording, a 360 and 361 are required for each group of ten 24/26*s which may simultaneously call for time.

PREREQUISITE: Clock Read-in (#1945) on the 24/26* Card Punch.

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Cable: #9081 for direct connection to a single output punch, or #9082 for connection to multiple punches via a common line ... see Physical Planning Manual GA24-1032.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
360	1	\$ 54	\$1,675	\$3.50

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Per Call: 1

361 READ-OUT CLOCK

[The 361 Model 1 is no longer available]

Purpose: Provides a means of punching time in output cards in a 357 Data Collection System.

Highlights: Time is read out as four digits ... hours (0-23) and nearest hundredths of hours.

PREREQUISITE: A 360 Clock Read-out Control and Clock Read-in (#1945) on the 24/26* Card Punch.

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
361	1	\$ 41	\$1,345	\$ 3

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Per Call: 1

* The 24 and 26 are GSD Machines.



DP Machines

M 372 - 374
May 79

372 MANUAL ENTRY

[The 372 Models 1, 2 and 3 are no longer available]

Purpose: For manual entry of data for transmission in a 357 Data Collection System.

Model 1 Has six slides.

Model 2 Has nine slides.

Model 3 Has twelve slides.

Model Changes: If Supervisor Key (#7578) is not installed, changes can be made from mdl 1 to 2 or 3, or mdl 2 to 3.

Highlights: Has up to twelve numeric slides, each with eleven character positions (0-9 and blank), which can be individually labeled. Slides may be locked in any desired position, or may restore to blank after each transmission. CE can wire any or all of the slides to read out zero from the blank position ... to change all positions to read out zero from the blank position, no additional parts are required ... to change any other number of positions, Part No. 765993, Jumper Assembly, must be ordered a no-charge

Slides are coded for individual read-out under card read control. The high order code position is on the left. Model 1 has six left-hand positions blanked out and the six right hand slides are coded 6 thru 1 ... model 2 is similar with the three left hand positions blanked out and the slide positions coded 9 thru 1 ... model 3 is coded 12 thru 1.

Limitation: Either a 372 or a 374 Cartridge Reader can be attached to a 357 mdl 5 or 6, not both.

PREREQUISITE: Each 372 requires a 357 mdl 5 or 6.

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

SPECIFY: Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
372	1	\$ 15	\$ 520	\$ 1.00
	2	18	607	1.50
	3	21	694	1.50

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Per Call: 1

SPECIAL FEATURES

SUPERVISOR KEY (#7578). Replaces left hand slide on mdl 1, 2 or 3 with a key-operated switch which provides a controlled ability to insert a specific authorizing digit in the output card for a transaction. **Field Installation:** Available at time of manufacture only.

Special Feature Prices:		MAC/ MRC	Purchase	MMMC	FIC
Supervisor Key	#7578	NC	NC	NC	PO

373 PUNCH SWITCH

[The 373 Model 1 is no longer available]

Purpose: For automatic switching to a second output punch in a 357 Data Collection System.

Highlights: Provides automatic switching to a second back-up punch if the first fails to duplicate, jams, or runs out of cards. Either or both punches may be placed on offline mode for use as a regular card punch by placing the "Auto" switch to "Keypunch."

PREREQUISITES: Two output punches per system ... 24/26 mdls 7 or 8, each with Punch Switch Control (#5930) ... see 26.

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621

SPECIFY: If old-style Elco (rectangular) connector on 358, order Adapter Cable Assembly, 765183, no-charge ... if old-style Elco (rectangular) connector on punch cable and an adapter cable which provides a round Cannon connector is not available, order Adapter Cable Assembly, 765181, no-charge

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
373	1	\$ 30	\$ 859	\$.75

Plan Offering: Plan B Purchase Option: 65% Maintenance: C
Warranty: B Per Call: 1

374 CARTRIDGE READER

[The 374 Model 1 is no longer available]

Purpose: Data cartridge input unit for a 357 Data Collection System.

Highlights: The IBM Data Cartridge permits the user to pre-set up to 12 positions of variable numeric data at his regular work station ... use is applicable primarily where variable numeric data must be entered into the system at a peak period. Throughput and accuracy in the 357 Input Station are increased and employee waiting time is reduced.

The cartridge is manually inserted and removed from the reader, which is cable-connected (3-1/2 feet) to and wall mounted to the right of the 357.

For use with 357 mdl 5 or 6, the cartridge is read out by the card in the same manner as the 372.

One data cartridge is supplied with each 374 ...

PREREQUISITE: Each 374 requires a 357 mdl 5 or 6.

Limitation: Either a 374 or a 372 Manual Entry can be attached to a 357 mdl 5 or 6, but not both ... however, 372s and 374s can be interchanged on a terminal without requiring changes in the output card of the output program.

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

SPECIFY: Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
374	1	\$ 21	\$ 637	\$ 1.50

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Per Call: 1



729 II/IV/V/VI MAGNETIC TAPE UNITS
[No longer available]

Model	Characters a Second	Recording Density (CPI)
729 II	15,000/41,700	200/556
729 IV	22,500/62,500	200/556
729 V	15,000/41,700/60,000	200/556/800
729 VI	22,500/62,500/90,000	200/556/800

Model Changes: 729 IIs can be changed to 729 Vs, or 729 IVs to 729 VIs.

The following specifications can be changed in the field:

- [1] Voltage (AC, 3-phase, 60 Hz): #9903 for 208 V, or #9905 for 230 V (must be consistent with system voltage).
- [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

SPECIAL FEATURES

The following special feature is on an "as available" basis for field installation.

TAPE SWITCHING FEATURE (#7830). Modifies the tape unit so that it can be logically switched between any two tape channels to which it is normally attached. Switching can be between two channels in the same system, channels of any two systems which use 729 II/IV/V/VIs, or a system channel and an offline auxiliary unit. [Caution: Care should be exercised in connection with density compatibility between channels, or the system channel and the offline unit.] Two add'l signal cable connectors, switching relays, a control cable connector and 50' of control cable are provided for attachment to the 7155. Advantages are: [1] Less tape unit set-up time ... [2] Less tape reel handling time ... [3] Permits scheduling of peak load use of tape units ... [4] Possible reduction of tape units required in an installation. See Manual GG22-6587 for details. **Prerequisite:** A 7155 Switch Control Console or 7711 Data Communication Unit.

-- FTP --

Special Feature Prices:	MAC/ MLC		MLC		Purchase	MMMFIC
	MRC	1 yr*	2 yrs			
Tape Switch Feature	#7830	\$ 91	\$ 84	\$ 76	\$4,070	\$9.00 \$106

* FTP = 12-23 months.

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DP Machines

M 803
May 79

803 PROOF MACHINE

Note: The 802 Proof Machine is no longer available ... for models changes and special features, see below.

Purpose: The 803 Proof Machine is used to simultaneously list, sort and prove business documents.

- Model 1** Endorsing ... 32 compartments and keys.
- Model 2** No endorsing ... 32 compartments and keys.
- Model 3** Endorsing ... 24 compartments and keys.
- Model 4** No endorsing ... 24 compartments and keys.

Note: Models 3 and 4 are capacity reduced from models 1 and 2 by rendering compartments 25 thru 32 inoperative.

Model Changes: Can be made in the field ... except from a 24 compartment machine to a 32 compartment machine.

Note: 802 models changes may be made in the field.

Highlights: Each sorting receptacle can hold approximately 150 documents (5/8" to 21/32"). Documents within the following dimensions can be fed: Width - 2-1/4" to 4-1/4" ... Length - 4" to 9-1/2" ... Thickness - cannot exceed 3/32". The cycling speed, fully-electric adding keyboard, repeat key, and other operating features permit continuous high-speed operation.

Amounts are simultaneously listed on both the control tape and one of the compartment tapes and accumulated in the grand, group and compartment total counters. All items, together with their identifying distribution numbers, are listed on a control tape. Up to 9-digit amounts can be entered through the adding keyboard for listing.

Each total counter has a printing capacity of 10 digits. Progressive totals (sub-totals) can be obtained on all counters and printed with an identifying symbol. For subtraction, the complement of the amount to be subtracted is entered on the adding keyboard and the "Subtract" key is depressed. 9s are then automatically printed to the left of the amount. On total accumulation and printing, the tenth position is not lost even though subtraction is by complementary addition.

Standard Features -- Control Panel with Non-feed Lock Suppression, Multiple Entry, Endorse Suppression (mdls 1, 3), Group Balancing, Group Balance Compartment Add ... Amount Clearance Lever ... Repeat, Multiple Entry, Auxiliary Credit, Adding Machine, Non-add C, Non-add C and C, Key Release, Subtraction, Grand Total, Group Total, Compartment Total, and Progressive Total Keys ... Ready, Add Key Depression, Near Depletion of Listing Tape, Non-endorse (mdls 1, 3), Non-feed, Full Pocket, Improper Feeding, and Non-balance Condition when Group Balancing Signals ... Switches -- for control of credit feeding and by-passing of automatic group balance totals for single machine cycle ... Paper Clip Receptacle ... Selected Compartment Indicator ... Ticket Tray ... two 5-position Transaction Counters ... Upholstered Arm Rest ... Work Tray.

Endorsing -- mdls 1 and 3 can endorse documents with date, identification numbers, and bank's legal endorsement. The Endorser Plate is made to the customer's specifications. See "Accessories" below. A Blank Endorser Plate is also available if only partial endorsements are required. When ordering #3792 attach Endorser Plate Specification ... not required for #3793.

Supplies ... endorsing ink roll, paper and ribbon supplies.

Manuals -- see "IBM Marketing Publications KWIC Index," G320-1621.

Specify: [1] Voltage (AC, 1-phase, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Endorsing (mdls 1, 3 only): See "Endorsing" above.

[3] Disabling Clamps: If required to prevent depression of the following key(s) -- #9120 for Subtract Key, #9121 for Repeat Key, #9122 for Auxiliary Credit Key. **Limitation:** #9122 cannot be installed with Multiple Credit (#5245).

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
803	1	\$205	\$9,000	\$108.00
	2	193	8,480	99.50
	3†	167	7,345	89.50
	4†	156	6,805	80.50

Plan Offering: Plan B Purchase Option: 35% Maintenance: C
Warranty: B Per Call: 1

† Prices for 802 mdl 1 are Rental -- \$120, Purchase -- \$7,785 and MMMC --\$73.50 ... prices for 802 mdl 2 are Rental -- \$110, Purchase -- \$7,215 and MMMC -- \$66.00.

SPECIAL FEATURES

NOTE: The following 803 feature can also be ordered for field installation on installed 802 Proof Machines.

MULTIPLE CREDIT (#5245). To simplify processing of multiple credit transactions under control of automatic group processing .. can also be used where single item deposits are processed in batches. A total can be obtained for a group of debits and balanced against a group total of the related credits. A "Multiple Credit" key replaces the standard "Auxiliary Credit" key. Prior to taking a group total of debit items, the "Group Balance By-pass" switch and "Multiple Credit" key are depressed, in that order. Any number of credit items can then be distributed without depressing the by-pass switch before recording each transaction. The multiple credit key remains depressed until the by-passed debit total is entered on the keyboard and a group balance operation is performed. **Limitation:** Cannot be installed if Disabling Clamp (#9122) for Auxiliary Credit Key is installed.

Special Feature Prices:	(803)	MAC/ MRC	Purchase	MMMC	FC
Multiple Credit	#5245	\$ 4	\$ 257	\$ 2.50	\$19

Accessories -- The following items are available on a purchase only basis for the 803. For shipment with machine, order the desired Feature # indicated below at the price listed in M 10000 pages.

- Endorser Plate (#3792)** -- 803 mdls 1 and 3 only.
- Blank Endorser Plate (#3793)** -- 803 mdls 1 and 3 only.
- Illuminating Lamp (#4610)** -- 803, all mdls.

Note: When ordering #3792, it is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

See M 10000 pages for description, ordering instructions and field installation.

For the 802, #3792 is available for field installation on mdl 1 ... #4610 is available for field installation on all mdls.



1001 DATA TRANSMISSION TERMINAL

Purpose: Combination punched card and keyboard unit for direct transmission to a 26* Card Punch mdl 5 or 6, or to a 7770 Audio Response Unit.

Highlights: Has a 10-digit keyboard and a card carriage with a fixed 80, 51 or 22-column feed. First 22 columns of prepunched data can be read from each card. To transmit data from a card, operator inserts card in carriage, face down, column 80 first, moves carriage to the left until it strikes carriage stop and releases it. As carriage returns to right hand position, first 22 columns of card are read serially from column 1 to 22. **Limitations:** Field skipping is not possible ... columns 23 and 24 must be unpunched.

Variable numeric data is entered via the keyboard ... additional function keys control the receiving unit. The 80-column card in a 26 mdl 5 or 6 can accept up to 80 columns of transmitted data.

When equipped with Alphabetic Transmit (#1222), the 1001 can transmit alphameric data to a 26 equipped with Alphabetic Receive (#1221) ... see "Special Features" below and under 26. When #1221 is installed on a 26, numeric 1001s can be used only if they use alphabetic transmitting data sets, or if the 26 is equipped with Intermix (#4702).

The unit weighs only 21 pounds. It is cable-connected to the telephone hand set, from which it obtains its power. Its size, 18-1/2" x 8" x 5", makes it a convenient desk or table top unit.

Communication Facilities: The 1001 transmits at a rate of 12 characters/second over common carrier leased private line telephone service, common carrier switched telephone networks, or privately owned voice grade facilities. Connection from the 1001 to the output unit is set up by normal telephone dialing.

Port-A-Punch® Cards: Column 80 of card cannot be part of a Port-A-Punch field ... a maximum of 11 Port-A-Punch columns can be read on a numeric 1001; a maximum of 18 if Alphabetic Transmit (#1222) is installed ... no punching is allowed in the columns adjacent to the Port-A-Punch columns ... the columns to be read can vary in number within the maximums, but must be adjacent ... on a numeric 1001, column 24 cannot be punched; with #1222, column 38 cannot be punched. Care should be exercised in handling and inserting Port-A-Punch cards so that chads will not be loosened.

Limitations: The standard machine feeds only standard punched card stock ... Aqua Cards or other special cards (except Port-A-Punch) cannot be fed by either feed.

Environment: The unit should be located in an area free of significant abrasive, corrosive and vibration producing elements. It should not be subjected to temperatures beyond the range of 40° to 120° F, or relative humidities of 20% to 85% ... where no cards are used, humidities to 95% are allowable. For best transmitting results, it is recommended that the unit be located in an area free of background noise.

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

SPECIFY: [1] Feed: #9181 for 80-column, #9183 for 51-column, or #9184 for 22-column. #9181 can be changed to #9183, or vice versa, in the field.

[2] Output Unit: #9470 if transmission is to a 26, or #9471 if transmission is to a 7770.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	1001 1	\$ 16	\$ 455	\$ 4
Plan Offering: Plan B		Purchase Option: 45%		Maintenance: C
Warranty: B		Per Call: 1		

SPECIAL FEATURES

ALPHABETIC TRANSMIT (#1222). [Plant installation only] To transmit 26 alphabetic characters and three special characters ("12", "11" and "0-1"), as well as the standard 10 digits, from first 36 columns of each prepunched card. In transmitting to a 26, if a "space" is preferred to the "0-1" punch at the 26, order Space Code Generation (#7244) for the 26. **Limitations:** Operates only with an 80 or 51-column feed ... 22-column stub cards cannot be processed ... columns 37 and 38 in cards to be transmitted must be left unpunched (in lieu of columns 23 and 24 left blank when this feature is not installed) ... field skipping is not possible.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Alphabetic Transmit #1222	\$ 8	# 281	\$.75	PO

1026 TRANSMISSION CONTROL UNIT

[No longer available]

The following specifications can be changed in the field:

- [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.
- [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

The following special features are on an "as available" basis for field installation:

ADDITIONAL LINE FEATURE (#1058). Required on each 1026 attached to a system after the first 1026. **Maximum:** One. **Prerequisite:** Expanded Line Feature (#3937) on the first 1026 attached to the system.

AUTOMATIC ANSWERING (#1286). Provides the 1026 with the ability to automatically answer incoming calls initiated by remote 1050s over common carrier switched (dial-up) facilities ... the line must be equipped with an appropriate data set. **Maximum:** One.

AUTOMATIC CALLING (#1304). Provides the 1026 with the ability to automatically initiate outgoing calls to remote 1050s over common carrier switched telephone and 150 baud TWX facilities ... the line must be equipped with an appropriate data set and automatic calling unit. **Maximum:** One. **Prerequisite:** Automatic Answering (#1286).

EXPANDED LINE FEATURE (#3837). Provides controls on the first 1026 attached to the system for attachment of up to three additional 1026s and/or a 1032 Digital Time Unit. **Maximum:** One, on first 1026 only.

FIXED TIME-OUT (#4415). Provides for a transmission delay of approximately 1 second following the transmission of either a Horizontal Tab, or a New Line and Line Feed. **Maximum:** One. **Specify:** One or both of the following -- #9340 for Horizontal Tab ... #9485 for New Line and Line Feed.

LINE ADAPTER (#4790). For attachment of a communication line that can be used for on-site 1030, 1050, 1060 or 1070 terminals for a distance up to 8 wire-miles. No common carrier data sets are required. Line lengths for this feature will vary, depending upon type of cable and configuration of system. Use of common carrier channels also requires special considerations. For assistance with line configuration problems, consult Regional Physical Planning Representatives. **Maximum:** One. **Specify:** One of the following -- #9420 for use with 1030s, #9421 for 1060s, #9422 for 1050s or 1071 mdl 1s, or #9423 for 1071 mdl 2s.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Additional Line Fea #1058	\$ 5	\$ 252	\$.50	\$30
Automatic Answering 1286	10	506	.50	14
Automatic Calling 1304	41	1,945	.75	32
Expanded Line Feature 3837	5	252	.50	32
Fixed Time-out 4415	5	252	.50	15
Line Adapter 4790	10	506	.50	29

* The 26 is a GSD machine.



1031 INPUT STATION

Purpose: Input station for a 1030 Data Collection System. Used to transmit data at 60 cps from cards, badges, data cartridges or manual entry to a 1026/1448 Transmission Control Unit, 1034 Card Punch, 2025 Processing Unit with Integrated Communications Attachment (#4580), 3115 or 3125 Processing Unit with Integrated Communications Adapter (#4640), 2701 Data Adapter Unit, 2702/2703 Transmission Control, or 3704/3705 Communications Controller.

Models:	Control Station	Satellite Station
For card input	A1	B1
For card input and manual entry	A2	B2
For card and data cartridge input	A3	B3
For card and badge input and manual entry	A4	B4
For card, badge, and data cartridge input	A5	B5
For badge input	A6	B6
For card and badge input	A7	B7

Model Changes: Cannot be made in the field.

Highlights: A compact industrial unit. Offers station set-up checking prior to communication line acknowledgement, ease of operation, installation and relocation. NOTE: Can be mounted on a wall or a free standing pedestal. Wall brackets or pedestal are not included in the unit's price. Pedestals are available from IBM or outside vendors. See SRL GA24-3021 for pedestal specifications.

1031 mdl As provide data transmission via 2-wire communication lines and control 1031 mdl Bs and 1033 Printers attached to them by multiwire cables. As far as the user is concerned, operation of comparable A and B models are identical. Depending upon the model, the 1031 has one or more of the following means of input and standard features:

Card Reader — standard or Port-A-Punch® prepunched 80-column cards can be individually inserted and removed manually. An upper left corner cut C1 is required. M3, M4 and M5 scores can be used. Numbers, letters and IBM special characters (see SRL GA24-3018) are read. Blank card columns are not recognized and are automatically skipped.

Badge Reader — reads identification badges (22-column stub card size) prepunched in IBM code with a maximum of ten digits. The badges, which are punched on a 13 Badge Punch, are inserted and removed manually. Badges with or without a pocket clip can be read. They can be purchased from outside vendors, or produced by commercially available equipment. See SRL GA21-9028 for badge specifications. NOTE: A badge gauge is provided at no charge with each badge punch ... see 13 Badge Punch.

Manual Entry — a means of entering variable numeric source data in addition to the fixed data entered by card and badge. Each of the 12 slides has 11 character positions (0-9, and blank), and can be individually labeled. The slides restore to blank after each correct transmission, or may be restored by depressing the clear button for operator or retransmission error. Panel wiring provides detection of columns set to blank for selected groups of slides.

Cartridge Reader — reads the data cartridge, a device which provides for off-station entry of up to 12 positions of variable numeric data. The cartridge is inserted and removed manually. Cartridge slides retain their setting and are not restored by action of the reader. Panel wiring provides detection of columns set to blank for selected groups of slides.

One data cartridge is furnished with each 1031 mdl A3, A5, B3, B5 ... pocket size — 7-3/8" long, 3-1/4" deep, and 1/2" thick ... used for setting up variable information away from the 1031, reducing station set-up time and making the 1031 available to more users in a given period. additional cartridges,

Lights — all models have appropriate Card, Badge, Manual Control, Repeat, and In-process indicator lights.

Clear Button — on all models, ejects all cards, badges and data cartridges and restores the manual entry and cartridge reader.

Mode Switch — on mdls A2 thru A5, A7, B2 thru B5, B7, places the 1031 in card, badge or manual control mode.

Set-up Instruction Reference — on mdls A2, A4, B2, B4, a thumb knob and scroll which gives rapid reference to set-up instructions.

Customer Responsibilities — see 1030 in "Systems."

PREREQUISITE:

line terminators will be shipped from the plant. Line terminators are provided to the customer at no charge. For guidance in determining the number of line terminators required, see Physical Planning Manual, GA24-3021.

LIMITATIONS:

1031 mdl As

- [1] Distance — the maximum length of a customer-provided 2-wire communication line is a function of the number of input stations, line characteristics and network configuration. Approximate limitations are up to 8 miles. A Common Carrier Adapter (#2068), operating with external data sets, or an IBM Line Adapter (#4647) permits transmission over greater distances via a 4-wire full duplex common carrier leased voice grade channel. Detailed information on communication lines is contained in SRL GA24-3021. See the M 2700 pages for information on communication facilities.
- [2] The maximum number of 1031 As per 2-wire line is ten.
- [3] A maximum of eight 1031 Bs can be connected to a 1031 A.
- [4] A maximum of twenty-four 1031s, mdl As and Bs combined, can be attached to a 2-wire line.
- [5] Up to nine 1033s can be attached to a 1031 A equipped with a 1033 Printer Attachment (#1279) ... up to twenty-four 1033s can be attached to one 2-wire line. NOTE: Up to twenty-four 1033s, plus twenty-four 1031s can be attached to one line.
- [6] When the line terminates in a 1034 Card Punch, 1033s cannot be attached to the line.
- [7] Either a 1033 Printer Attachment (#1279) or a Common Carrier Adapter (#2068) can be installed on a 1031 A, not both.

1031 mdl Bs

- [1] Maximum cable length (1031 B to 1031 A) is 3,000 feet.
- [2] A maximum of eight 1031 Bs can be attached to a 1031 A.

Environment: See 1030 in "Systems."

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

- SPECIFY:** [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9880 for 115 V, locking plug, or #9881 for 115 V, non-lock plug.
- [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.
 - [3] Method of Installation: #9410 if junction box, or #9411 if junction point. Cables or connectors will be shipped automatically prior to scheduled delivery. A 20", 2-wire main line signal cable is shipped for a 1031 A. See Physical Planning Manual GA24-3021.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMM
1031	A1	\$108	\$4,540	\$13.00
	A2	135	5,585	15.50
	A3	120	4,870	19.50
	A4	151	6,220	30.50
	A5	135	5,510	32.00
	A6	108	4,540	9.50
	A7	125	5,040	27.50
	B1	54	2,270	7.00
	B2	81	3,315	11.00
	B3	65	2,600	14.00
	B4	96	3,955	15.00
	B5	81	3,230	19.50
	B6	54	2,270	5.50
	B7	70	2,855	14.00

Plan Offering: Plan B Purchase Option: 45% Maintenance: C
Warranty: B Per Call: 1

SPECIAL FEATURES

ATTACHMENT, 1033 PRINTER (#1279). [Models A1 thru A7 only] To control up to nine 1033 Printers by one 1031 A. Includes 4' junction box cable or connector as specified in "Method of Installation" under "Specify" above. Limitation: Cannot be installed with Common Carrier Adapter (#2068).

†COMMON CARRIER ADAPTER (#2068). [Models A1 thru A7 only] Provides for long distance data transmission via external data sets over 4-wire full duplex communication lines provided by common carriers. Note: Where multiple 1031 mdl As are to operate over a 4-wire full duplex line, only one 1031 mdl A is directly connected to the external data set ... additional 1031 mdl As are connected to the first 1031 mdl A, which is interfaced to the external data set, via a 2-wire communication line ... specifications for the 2-wire line are contained in SRL GA24-3021. Limitation: Cannot be installed with 1033 Printer Attachment (#1279) or IBM Line Adapter (#4647). Specify: For cable assembly from 1031 mdl A to common carrier data set — #9021 and quantity (length in feet ... maximum, 40).

CONTROLLED RESET (#2290). [Models A2 thru A5, A7, B2 thru B5, B7 only] For operator switch control of badge, manual entry, or data cartridge retention for subsequent records.

† For further information on IBM Line Adapters, see M 2700 pages.

1031 Input Station (cont'd)

IBM LINE ADAPTER (#4647). [Models A1 thru A7 only] A modem to allow the 1031 mdl A terminal to communicate over unlimited distances with a 2702/2703 Transmission Control, 3704/3705 Communications Controller, a 2025 with ICA (#4580) via a 2711 Line Adapter Unit, a 3115 or 3125 with ICA (#4640), or a 1034 Card Punch. This adapter uses 4-wire leased common carrier private lines, or equivalent privately owned communication facilities. When installed, the standard 2-wire, 8 mile modem cannot be used. For line specifications, see SRL GA24-3435**. Up to twenty-four 1031 mdl As, each equipped with this feature, can be multi-dropped on a line. Common carrier considerations, however, will limit the size of the network. If a system with more than ten points is proposed, a service inquiry to the common carrier must be initiated by the customer. **Limitation:** Cannot be installed with Common Carrier Adapter (#2068). **Prerequisite:** An IBM Line Adapter (#4647) on the 1034 or 2711.

INDIVIDUAL SLIDE LOCK (#4652). [Models A2, A4, B2, B4 only] A group of three slide controls ... for operator control of individual manual entry slide reset. **Maximum:** Four groups.

INPUT EDIT LEVELS, ADD'L (#4654). [Models A2 thru A5, B2 thru B5 only] A group of four additional input levels (E, F, G, H). Input edit levels are used to select the proper input device for a given transaction, edit the input before transmission, and select the proper point for end-of-block code. **Limitation:** Cannot be installed with 1035 Attachment (#7961).

INQUIRY KEY (#4684). [Models A2 thru A7, B2 thru B7 only] Permits authorized inquiry to a system processor ... output is via a 1033 Printer. One key is provided ... additional keys,

MONITOR KEY (#5140). [Models A2 thru A7, B2 thru B7 only] Used where a supervisor's approval is required before a record can be transmitted. One key is provided ... additional keys,

1035 ATTACHMENT (#7961). To attach from one to four 1035 Badge Readers. Provides a means of scanning up to 30 columns of badge punching and assigning badge reader identification characters. Includes a 4' cable for junction box connection to 1035s, shipped automatically

Limitations: Plant installation only

on 1031 A models ... cannot be installed with Add'l Input Edit Levels (#4654) ... installation of this feature is incompatible with some 1031 RPQs.

Prerequisites: For 1031 A mdls - 1035 Control (#7962) ... for 1031 B mdls - #7962 on the controlling 1031 mdl A.

1035 CONTROL (#7962). [Models A1 thru A7 only] Required on a 1031 mdl A to install a 1035 Attachment (#7961) on the 1031 mdl A itself, or on any 1031 mdl Bs controlled by the 1031 mdl A. The feature detects any blanks and invalid data transmitted from badge readers and controls operation of Repeat lights for the 1035s.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC	
Attach, 1033 Printer	#1279	\$16	\$ 715	\$1.50	\$ 21
Common Carrier Adapt	2068	28	1,155	1.00	34
Controlled Reset	2290	2	95	1.00	17
IBM Line Adapter	4647	10	347	3.50	132
Indvl Slide Lock, gp of 3	4652	2	95	1.00	9
Input Edit Levels, Add'l					
gp of 4	4654	4	186	1.00	16
Inquiry Key	4684	2	43	1.00	17
Monitor Key	5140	2	30	1.00	9
1035 Attachment	7961	16	650	1.50	138
1035 Control	7962	5	225	1.00	47

1032 DIGITAL TIME UNIT

Purpose: Used to associate time of day with output records of a data collection system.

Model 1 Has a synchronous motor drive.

Model 2 Is minute impulse self-regulating ... for attachment to user's master clock system.

Model Changes: Cannot be made in the field.

Highlights: Can furnish time data to any combination of up to twenty 24/26 Card Punches and 1034 Card Punches, and, in addition, to one 1026 Transmission Control Unit, or two 1448 Transmission Control Units, or two 2702 Transmission Controls.

Time advances once each minute and is read out as 4 digits ... hours (0-23) and nearest hundredths of hours. Can be used for 357 and 1030 Data Collection Systems, either on or off-line.

** SRL GA24-3435-2, or subsequent revisions.

Warning is provided upon the return of interrupted power, or failure of the timing source (synchronous motor or master time system) to initiate an advance cycle once each minute. Clocking periods for 24/26s or 1034s can be activated on any minute automatically or by manual operation. Synchronous standby is provided with the 1032 mdl 2.

PREREQUISITES:

For 24/26s (357s) - Clock Read-in (#1945) on each 24/26 ... Digital Time Read-out Control, 24/26/1034 (#3267) on the 1032 itself ... see "Special Features" below and GSD sales manual for 24/26 description.

For 1034s (1030s) - Digital Time Read-in (#3266) on each 1034 ... Digital Time Read-out Control, 24/26/1034 (#3267) on the 1032 itself ... see "Special Features."

For 1448s - Common Carrier Adapter Set - 1050/1060 (#2070) on each 1448 ... Digital Time Read-out Control, 1448 (#3268) on the 1032 itself ... see "Special Features."

For 1026s - Expanded Line Feature (#3837) on the first 1026 ... Digital Time Read-out Control, 1026 (#3269) on the 1032 itself ... see "Special Features."

For 2702s - 1032 Attachment (#7918), IBM Terminal Control - Type II (#4616) and Speed Extension (#7387) on each 2702, plus either IBM Line Adapter (#4613) or Data Set Line Adapter (#3233) on line No. 1 of each 2702 ... Digital Time Read-out Control, 2702 (#3273) on the 1032 itself ... see "Special Features."

Environment: See 1030 in "Systems."

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

SPECIFY: Voltage (AC, 1-phase, 60 Hz): Locking plug - #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug - #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V ... must be consistent with voltage of 1026, 1448 or 2702.

PRICES:	mdl	MAC/ MRC	Purchase	MMMC
1032	1		\$ 108	\$ 3
	2		125	4,830

Plan Offering: Plan B Purchase Option: 50% Maintenance: C
Warranty: B Per Call: 1

SPECIAL FEATURES

CLOCKING PERIOD ON-OFF CONTROL, ADD'L (#1940). For packed card punch operation ... a group of four periods in addition to those supplied with feature #3267 ... see below. **Maximum:** One.

DAY-OF-WEEK READ-OUT, 24/26/1034 (#3219). Numbers the days of the week 1 thru 7 for punching into cards on 24/26/1034 card punches in 357 or 1030 Data Collection Systems. Upon reaching day 7, the next advance returns the device to day 1. Advancement from one day to the next may be wired (pluggable) to cause a day change at any minute during the 24-hour period. Read-out to 1034s consists of 5 digits (tens of hours, units of hours, tenths of hours, hundredths of hours, and day-of-week). Read-out to 24/26s is limited to 4 digits (tens of hours, units of hours, tenths of hours, and day-of-week) ... hundredths of hours cannot be punched in output records when used with a 24/26.

Prerequisites: Digital Time Read-out Control, 24/26/1034 (#3267) ... Day-of-Week Read-in (#3200) on each 1034.

DIGITAL TIME READ-OUT CONTROL, 24/26/1034 (#3267). Provides compatibility with 24/26/1034 card punches used for output from 357 and 1030 Data Collection Systems ... can read time to any combination of up to twenty card punches. **Specify:** #9018, for 4' cable assembly from 1032 to junction box for multiple 24/26s (cable is shipped 30 days prior to scheduled delivery), or #9019, for 15' cable assembly from 1032 to a single 24 or 26. **Note:** Cable assembly for 1034 attachment to 1032 is included with Digital Time Read-in (#3266) on 1034 ... see 1034.

DIGITAL TIME READ-OUT CONTROL, 1448 (#3268). Provides compatibility with a 1448 Transmission Control Unit. A maximum of two 1448s can be attached to a 1032 for time read-out. One #3268 is required on the 1032 for each 1448. A 20' cable (1032 to 1448) is provided with each feature. **Limitation:** Cannot be installed with #3269 or #3273. **Maximum:** Two.

DIGITAL TIME READ-OUT CONTROL, 1026 (#3269). Provides compatibility with a 1026 Transmission Control Unit. A 15' cable (1032 to 1026) is provided. **Limitation:** Cannot be installed with #3268 or 3273. **Maximum:** One.

DIGITAL TIME READ-OUT CONTROL, 2702 (#3273). Provides



1032 Digital Time Unit (cont'd)

compatibility with a 2702 Transmission Control. A maximum of two 2702s can be attached to a 1032 for time read-out. One #3273 is required on the 1032 for each 2702. A 20' cable (1032 to 2702) is provided with each feature. **Limitation:** Cannot be installed with #3268 or #3269. **Maximum:** Two.

Special Feature Prices:		MAC/ MRC	Purchase	MMMC	FIC
Clocking Period On-Off Control, Add'l	#1940	\$ 5	\$ 69	\$.50	\$15
Day-of-Week Read-out, 24/26/1034	3219	10	434	3.50	54
Digital Time Read-out Control					
24/26/1034	3267	10	498	.50	21
1448	3268	37	1,615	.75	29
1026	3269	37	1,615	.75	29
2702	3273	48	1,700	1.25	78

1033 PRINTER

Purpose: Output page printer for 1030 Data Collection Systems used online with a data processing system via a 1026/1448 Transmission Control Unit, 2701 Data Adapter Unit, or 2702/2703 Transmission Control.

Highlights: A compact industrial unit which can be mounted on a wall or on a free standing pedestal. **Note:** Wall brackets or pedestals are not included with the unit. Pedestals are available from outside vendors or from IBM ... see SRL GA24-3021 for pedestal specifications.

The printer is controlled by the data processing system through the 1033 Printer Attachment (#1279) on a 1031 Input Station A model. Addressing is performed by programming in the processor. Remote inquiries for print-out initiate from a card reader, badge reader, or manual entry of an associated 1031 A or B model. Data is transmitted to the printer at 14.8 cps. The printer operates in downshift mode ... prints 26 letters, 10 digits and 8 special characters ... uses a removable Processor Printing Element - see "Type Catalog" ... horizontal spacing is 10 characters/inch ... roll paper is fed by a 15" friction feed solid platen with a 13" print line ... ribbons are available through the OP division or outside vendors. **Note:** For unattended operation or multi-part (up to 5) form paper, a Pin Feed Platen is required ... see "Special Features."

System Checking - each character received by the printer must contain an odd number of bits. A 6-bit BCD code plus a parity bit and a start and stop bit (total of nine bits) is used. Parity checking of each character is performed by the receiving 1031 mdl A.

PREREQUISITES: A 1033 Printer Attachment (#1279) on the associated 1031 mdl A ... Attachment Feature - 1030 (#1274) and Attachment Feature - 1033 (#1277) on a 1448 ... for requirements for use with a 1026 or 2701, see those units.

Limitations: 1033s cannot be used in 1030 systems attached to a 1034 Card Punch ... 1033s cannot be attached to a 1031 with a Common Carrier Adapter (#2068) installed ... a maximum of nine 1033s can be attached to a 1031 mdl A ... maximum cable length (1033 to 1031 mdl A) is 3,000' ... see SRL GA24-3021 for detailed information.

Environment: See 1030 in "Systems."

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9880 for 115 V, locking plug, or #9881 for 115 V, non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Method of Installation: #9410 if junction box, or #9411 if junction point. Cables or connectors will be shipped automatically prior to scheduled delivery date. See SRL GA24-3021.

[4] Printing Element: #9575 for Processor - Standard, or #9579 for Processor - "H" Option ... see "Type Catalog."

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1033	1	\$117	\$4,125	\$ 8.50

Plan Offering: Plan B Purchase Option: 50% Maintenance: C
Warranty: B Per Call: 1

ACCESSORY FEATURE

PIN FEED PLATEN (#9509). [Purchase Only] For Plant Installation - specify #9509. Maximum one, in lieu of standard friction feed platen. See "Pin Feed Platens" on M 10000 pages for available options, feature #s to be specified and price. For Field

Installation - to order add'l platens, or to order one for field installation

1034 CARD PUNCH

Purpose: Output card punch for data transmission from 1031 Input Stations and 1035 Badge Readers in a 1030 Data Collection System.

Highlights: The 1034 receives data from up to twenty-four 1031s over a single communication line. Two lines can be attached to a 1034. The second line is normally used for emergency back-up for another 1034, or, where the application does not require emergency back-up, as provision for attaching up to forty-eight 1031s to one 1034.

Transmitted data is punched at 60 characters/second ... non-transmitted data, time and common data is punched at 80 characters/second. Eight rotary dials controlled by the 1034 operator each permit entry of "12", "11" and "0-9" punches as common data into the output record. Time can be punched into output records when a 1032 Digital Time Unit is attached to a 1034 equipped with Digital Time Read-in (#3266) ... see "Special Features."

The unit has a 1,200-card capacity hopper and a 1,300-card capacity stacker. Interlocks stop machine operation when the hopper becomes empty. If the stacker is full, a card jams, or transmission is interrupted, an audible alarm signals the operator.

Systems Checking - provides odd parity on all characters received, plus a record length, blank column and punch compare check. Five consecutive records in error stop the punch and activate an audible alarm.

Control Capabilities - each 1034 can poll up to twenty-four 1031s on each of two lines, with a maximum of two lines possible. A mixture of 1031 mdl As and Bs can be attached to each line. However, only 1031 mdl As can be connected directly to the 2-wire communication line leading to the 1034. See 1031 for allowable ratios of 1031 mdl As and Bs and SRL GA24-3021 for communication line specifications.

Use with 1035s - 1035 Receive Control (#7963) is required when 1035 Badge Readers are used in the system. Also review Variable Record Length (#8695) and Packed Card Column Counter (#5491) under "Special Features."

Limitation: 1033 Printers cannot be attached to 1031 mdl As which transmit to a 1034.

Environment: See 1030 in "Systems."

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9880 for 115 V, locking plug, or #9881 for 115 V, non-lock plug. **NOTE:** Two 20', 2-wire main line signal cables are shipped automatically prior to scheduled delivery of the 1034 ... see SRL GA24-3021.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1034	1	\$ 404	\$16,580	\$ 37.00

Plan Offering: Plan B Purchase Option: 50% Maintenance: C
Warranty: B Per Call: 1

SPECIAL FEATURES

†**COMMON CARRIER ADAPTER (#2068).** Provides for long distance data transmission via external data sets over 4-wire full duplex communication lines provided by a common carrier. Transmission rate is 60 cps/600 bps. Local 2-wire capabilities of standard machine are not affected by installation of this feature. **Specify:** For cable assembly from 1034 to external data set, #9021 and quantity (length in feet) ... maximum length with Line Transfer (#4835) installed is 20' ... without #4835, maximum length is 40'. **Limitation:** Cannot be installed with IBM Line Adapter (#4647).

DAY-OF-WEEK READ-IN (#3200). Required if Day-of-Week Read-out (#3219) is installed on a 1032 ... see 1032. **Prerequisite:** Digital Time Read-in (#3266).

DIGITAL TIME READ-IN (#3266). Required to attach a 1032 Digital Time Unit for time read-in to the 1034 ... a 15' cable (1034 to 1032 or adjacent 1034) is furnished.

† For further information on IBM Line Adapters, see M 2700 pages.

** SRL GA24-3435-2, or subsequent revisions.

1034 Card Punch (cont'd)

IBM LINE ADAPTER (#4647). A modem for unlimited distance use with a 4-wire leased common carrier private line or equivalent privately owned communication facilities. For line specifications, refer to SRL GA24-3435**. When this feature is installed, the standard 2-wire, 8 mile modem can also be used. **Limitations:** Cannot be installed with Common Carrier Adapter (#2068) ... all 1031s connected through this feature must have their polling addresses in sequence at the beginning of the polling list (B, C, D, etc.) ... a 1034 used for backup of another 1034 equipped with this feature must also have this feature.

LINE TRANSFER (#4835). Provides the ability to transfer automatically the communication line or lines from the normal channel of a 1034 to the backup channel of an adjacent operating 1034. If the card punch requires the Common Carrier Adapter (#2068) for normal operation, the card punch assigned to back up this unit must also have #2068 installed. **Limitations:** Up to three 1034s in a given installation can be connected in a backup configuration. However, only a single punch can be assigned to back up any one other punch ... for systems using common carrier data sets, the length of the cable from the data set to the 1034 must not exceed 20'. A 15' inter-machine cable is provided. **Prerequisite:** All 1034s connected in an automatic backup configuration must be equipped with #4835.

PACKED CARD (#5490). For punching more than one record into a single card during specified time periods under control of a 1032 Digital Time Unit. **Prerequisite:** Digital Time Read-in (#3266).

PACKED CARD COLUMN COUNTER (#5491). Provides better packing of records punched in output card when 1035 Badge Readers are used in the system and the 1034 is operating in packed card mode. Also provides the ability to punch two record types (two transaction codes) in the packed card mode. The feature effectively counts card columns punched in the output card and feeds a new card when insufficient columns remain to punch a maximum length record. Transaction codes and counter column count are wired at installation as specified by the customer. **Prerequisites:** 1035 Receive Control (#7963), Packed Card (#5490), and Digital Time Read-in (#3266).

SELECTIVE STACKER (#6406). An additional stacker which may be used to select cards containing a specific transaction error or error indication.

1035 RECEIVE CONTROL (#7963). Required when 1035 Badge Readers are used in a 1030 system. Provides immediate repolling of an address when an error is detected by the 1034.

VARIABLE RECORD LENGTH (#8695). Provides record length checking for variable length records received under the same transaction code. Required when data is received from 1035 Badge Readers and the record length varies in increments of either 3, 4, 5, 6, 7, 9, 10 or 11 characters. Wired at installation for a single transaction, code and increment specified by customer. **Note:** Increment used is equal to number of columns read from a single badge, plus 1 ... for an increment of 8 (7-column badge), the standard modulus 8 feature is used. **Prerequisite:** 1035 Receive Control (#7963).

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Common Carrier Adapt #2068	\$ 28	\$1,155	\$3.50	\$ 40
Day-of-Week Read-in	3200	4	.173	.50
Digital Time Read-in	3266	16	715	3.00
IBM Line Adapter	4647	42	1,675	4.00
Line Transfer	4835	13	416	.50
Packed Card	5490	32	828	.50
Packed Card Col Cntr	5491	5	203	.50
Selective Stacker	6406	21	918	.75
1035 Receive Control	7963	5	203	.50
Vrbl Record Length	8695	5	217	.50

1035 BADGE READER

Purpose: An input station for a 1030 Data Collection System or a 2790 Data Communication System. Used to transmit numeric data read from badges via a 1031 Input Station or a 2791 Area Station mdl 1 to a central collection point.

Highlights: A small industrial unit which can be wall or shelf-mounted. Simple in operation, the 1035 reads identification badges (22-column stub card size) prepunched in IBM card code with a maximum of ten numeric digits. See SRL GA21-9028 for badge specifications.

For 1030 Systems - up to four 1035s can be connected to any A or B model 1031 via a common multi-wire cable not exceeding 1,000 feet. Cable connections are made via customer-provided junction boxes and cables, except for the IBM-provided 4 foot

attachment cable to the junction box ... see "Specify." See Physical Planning Manual, GA24-3021 for details.

Functionally, 1035s can be thought of as additional columns of badge reading which are located remotely from the 1031 with which they are associated. When the 1031 is polled, all badge readers (including the one in the 1031 if it is so equipped and the mode switch is set to badge) are scanned sequentially and transmit as one block of data. Empty badge readers are scanned timewise, but no data is transmitted. Thus, a transmitted block of data will vary in length, depending upon the number of badge readers ready when the 1031 is polled. If no badge readers are ready when the 1031 is polled, no data is transmitted. Each badge record in a transmitted block (up to a total of five) is automatically preceded by a character identifying the badge reader. From a user point of view, the 1035 operates in a manner identical to a 1031 mdl A6 or B6. An inserted badge is locked in position, read, and automatically released.

For 2790 Systems - up to three 1035s can be connected to any 2791 mdl 1 via a common multi-wire cable not exceeding 1,000 feet. Cable connections are made via customer-provided junction boxes and cables, except for the IBM-provided 4 foot cable to the junction box ... see "Specify." See Physical Planning Manual GA27-3017 for details.

Operator Controls: A Repeat light indicates a detected transmission error. A Clear button is provided to turn off the Repeat light and to release the badge.

Customer Responsibilities: See M 2700 pages.

PREREQUISITES:

For 1030 - [1] 1035 Attachment (#7961) on the associated 1031 ... [2] 1035 Control (#7962) on a 1031 mdl A equipped with #7961 and/or which controls 1031 mdl Bs equipped with #7961 ... [3] 1035 Receive Control (#7963) on the 1034 Card Punch (for offline systems) ... [4] Variable Record Length (#8695) on the 1034 if the number of columns read per badge is 2, 3, 4, 5, 6, 8, 9 or 10. For 7 digits of badge (plus 1 for station number), the standard modulus 8 checking in the 1034 suffices.

For 2790 - a 2791 mdl 1 equipped with 1035 Attachment (#8030).

Limitations:

For 1030 - [1] The maximum cable distance from the farthest 1035 to its associated 1031 is 1,000 feet; total aggregate cable length connecting 1035s to their associated 1031 cannot exceed 2,000 feet; the total cable distance from the farthest 1035 via its associated 1031 to the controlling 1031 mdl A cannot exceed 3,000 feet. For details refer to SRL GA24-3021 ... [2] The number of 1035s attached to a 1031 cannot exceed four ... [3] The number of badge columns read from each 1035 (and associated 1031 if equipped with a badge reader and operating in badge mode) must be equal ... [4] The number of badge columns read in any badge reader cannot exceed ten ... [5] The total number of badge columns transmitted in one block cannot exceed 30. Thus, with five badge readers (one 1031 and four 1035s) the maximum number of columns read from each badge is six; with four badge readers - seven; with three badge readers or less - ten.

For 2790 - [1] The maximum cable distance from the farthest 1035 to its associated 2791 mdl 1 is 1,000 feet ... [2] The number of 1035s attached to a 2791 mdl 1 cannot exceed three.

Environment: See 1030 or 2790 in "Systems."

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz); #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Cable to Junction Box: #9410, if required. A 4-foot cable from the 1035 to a customer-provided junction box ... see Physical Planning Manual GA24-3021 or GA27-3017 for requirement. **Note:** If #9410 is specified, provide complete person's name and address for shipment ... cables will be shipped automatically, approximately 30 days prior to scheduled delivery.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1035	1	\$ 32	\$ 944	\$ 4
Plan Offering: Plan B		Purchase Option: 45%		Maintenance: C
Warranty: B				Per Call: 1

1071 TERMINAL CONTROL

[No longer available ... orders are on an "as available" basis]

Purpose: Control unit for a 1070 Process Communication System.

Model 1 Used for 14.8 cps transmission.

Model 2 Used for 66.6 cps transmission.

Model Changes: Can be made in the field.

Highlights: A 1071 is required in each system ... it controls selection and conversion of process signals in either random or sequential mode ... speed of selection and conversion depends upon the 1071 model.

Supplies the line control governing data transmission and checks all transmitted and received data for validity. **NOTE:** For communications facilities and attachment to communications lines, see 1070 in "Systems."

The basic 1071 contains logic for addressing 50 input/output points. This capacity can be expanded to 300 points, in modules of 50 ... see "Special Features." Performs contact sense, decimal and BCD input, and contact operate functions. Process alert logic informs the associated processor of interrupt requests ... see "Special Features" for extended input/output functions.

A compact unit designed for industrial environments, it can be mounted in standard 19" relay racks ... racks are available from outside vendors.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage (AC, 1-phase, 60 Hz, locking plug): **#9880** for 115 V, **#9884** for 208 V, or **#9886** for 230 V, unless DC Power (**#3217, 3218**) is ordered.

[2] Data Set Attachment: One of the following, depending upon the data set to be used -- **#9110** or **#9111** for facility D1, **#9110** for facility D2, **#9112** for the IBM Line Adapter (**#4792**). See the D1M and D2M facilities in the M 2700 pages for applicability of these codes.

[3] Cables: Use 1070 Cable Order Form -- (a) length of cable to data set ... (b) length of Digital Input Channel cable, Display Attachment cable and Printer Attachment cable, when purchased from IBM. **NOTE:** The three cables after (b) are special cables, purchased at \$1.90 per foot and installed by the customer. Completed cable order form must be received at least 90 days prior to installation date.

[4] When 1070 terminals are controlled by a 1050 system as a master station, consult for special requirements.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	1	\$ 199	\$6,775	\$ 23
	2	212	7,190	23

Plan Offering: Plan B Purchase Option: 60% Maintenance: B
Warranty: B Per Call: 2

SPECIAL FEATURES

ADD'L ADDRESSING MODULE (#1048). Adds 50 addresses to the 1071's addressing range. One feature is required for each 1072 Terminal Multiplexer added after the first one. **Maximum:** Five.

ANALOG-TO-DIGITAL CONVERTER (#1262). Converts analog input signals, full scale range -1 to +5 V, to their equivalent 3-digit values. Conversion rate is approximately 5/second for 1071 mdl 1, 20/second for mdl 2.

ADC EXTENDED RESOLUTION (#1263). Increases Analog-to-Digital Converter (#1262) resolution from 0.1% to 0.025% of full scale range ... for improved analog conversion accuracy.
Prerequisite: Analog-to-Digital Conversion (#1262).

DC POWER SUPPLY ADAPTER (#3217, 3218). For operation of the 1071 from +12 to +24 V DC power to permit use with back-up battery power. **#3217** -- for +24 V ... **#3218** -- for +12 V.

DISPLAY ATTACHMENT (#3345). Converts output data into decimal "one-out-of-ten" code for attachment of 1074 Binary Display, 1075 Decimal Displays, and customer's decimal output devices to the 1071 ... also required for 1073 mdls 1 and 3.

† **LINE ADAPTER (#4792).** For attachment to customer-owned or leased telephone cable facilities for in-plant operation ... not exceeding 8 wire-miles.

MULTI-CHARACTER INPUT (#5185). Extends basic 1071 digital input capability to include extended BCD code (B, A, 8, 4, 2, 1, C) and externally synchronized multi-character input devices ... re-† For further information on IBM Line Adapters, see M 2700 pages.

quired for 1078s.

PRINTER ATTACHMENT (#5561). To attach one or more 1053 mdl 2s to a 1071. **Prerequisite:** Display Attachment (#3345).

RANGE SELECT (#5960). For ADC conversion of analog signal, full scale ranges -10 to +50, -20 to +100, and -100 to +500 millivolts, to their equivalent 3-digit values. **Note:** Only one analog input range may be terminated per I/O Switching Module (#4663) on a 1072. **Prerequisite:** Analog-to-Digital Converter (#1262).

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Add'l Address Module #1048	\$ 3	\$ 131	\$.25	\$26
Analog-to-Digit Convert 1262	79	2,565	5.00	55
ADC Extend Resolution 1263	10	232	.25	12
DC Power Supply Adapter				
for +24 V	3217	10	423	1.50
for +12 V	3218	10	423	1.50
Display Attachment	3345	24	848	1.50
Line Adapter	4792	10	476	.50
Multi-character Input	5185	10	423	.50
Printer Attachment	5561	24	848	1.50
Range Select	5960	24	848	1.50

1072 TERMINAL MULTIPLEXER

[No longer available ... **MCS** orders are on an "as available" basis]

Purpose: Unit for addressing and terminating up to 50 input/output points ... analog inputs, decimal "one-out-of-ten" inputs, BCD and extended BCD inputs, contact sense inputs, or digital output/contact operate points in a 1070 system.

Highlights: Every 1070 system has at least one 1072 ... up to six can be connected to the 1071 Terminal Control for a total of 300 input/output points ... I/O points are installed in groups of ten (see "Special Features"). Each 1072 is cabled separately to the 1071 for maximum installation flexibility ... the unit is designed for mounting in a standard 19" relay rack.

PREREQUISITES: A 1071 mdl 1 or 2, plus one Add'l Addressing Module (#1048) on the 1071 for each 1072 attached after the first one.

Maximum: Six per system.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] I/O Switching Module(s) (#4663) -- see "Special Features." **NOTE:** No function is provided unless one or more I/O Switching Modules (#4663) is specified.

[2] Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of address cable (1072-1071) for each 1072 ordered ... (b) length of Analog Signal cable (1072-1071), required for each 1072 terminating analog input signals. **NOTE:** Address cable is a special cable, purchased at \$1.90 per foot and installed by the customer ... Analog Signal cable is a special cable, purchased at \$.25 per foot and installed by the customer.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	1	\$ 10	\$ 476	\$.50

Plan Offering: Plan B Purchase Option: 55% Maintenance: C
Warranty: B Per Call: 2

SPECIAL FEATURES

I/O SWITCHING MODULE (#4663). A multiplexer card for selection and termination of up to ten customer input or output points ... each module is assigned to any one of the following functions at time of installation:

Analog Input -- for selection of up to ten analog input points in any one of the following four ranges ... -1 to +5 V, -10 to +50 millivolts, -20 to +100 millivolts, or -100 to +500 millivolts. **Note:** ADC calibration requires two addresses of lowest analog input range and one address of each additional analog input range.

Digital Input -- for selection of up to ten contact sense, decimal or BCD inputs in any combination.

Digital Output -- for selection of up to ten contact operate points, display devices, or output printers in any combination.

Maximum: Five per 1072.

THERMOCOUPLE BLOCK (#7940). Provides an isothermal block and resistance bulb thermometer to measure "cold junction" thermocouple termination temperature. Each 1072 having thermocouple inputs must have a #7940. **Note:** Two analog input addresses, -10

1072 Terminal Multiplexer (cont'd)

to +50 millivolt range, are required to read the thermocouple block temperature. **Maximum:** One. **Prerequisites:** Analog-to-Digital Converter (#1262) and Range Select (#5960) on the 1071, plus at least one I/O Switching Module (#4663) on the 1072.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
I/O Switching Module #4663	\$ 6	\$ 211	\$.50	\$12
Thermocouple Block 7940	10	423	.50	12

1073 LATCHING CONTACT OPERATE - Model 1

[No longer available ... orders are on an "as available" basis]

Purpose: Unit for control and termination of up to 40 latching contact operate points in a 1070 Process Communication System.

Highlights: Each latching contact operate point is individually addressable and provides control of contact status (operating customer's devices) for any desired time period as determined by the processor program ... latching contact operate points are ordered in groups of two (see "Special Features"). Designed for mounting in standard 19" relay racks.

PREREQUISITES: Display Attachment (#3345) on the 1071, plus one or more I/O Switching Modules (#4663) on one or more 1072s ... each latching contact operate point uses one address assigned to Digital Output in an I/O Switching Module.

Maximum: Depends upon number of available addresses in I/O Switching Modules (#4663) on 1072s.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1073-1072), a second Address cable is required if more than 20 L.C.O. points are installed in the 1073 mdl 1, and (b) length of Data cable (1073-junction with Display Attachment cable) for each 1073 mdl 1 ordered. **NOTE:** Address cable and Data cable are special cables, purchased at \$1.90 and \$1.15 per foot respectively and installed by the customer.

PRICES: Mdl	MAC/ MRC	Purchase	MMMC
1073 1	\$ 16	\$ 635	\$1.50

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Per Call: 2

SPECIAL FEATURES

LATCHING CONTACT OPERATE POINTS (#4781). A group of two points for terminating outputs to customer devices. Output is one relay contact per point, rated at 100 Volt Amps, with a 1-amp non-inductive maximum current. **Maximum:** Twenty per 1073 (40 points).

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Latching Contact Operate Points (group of 2) #4781	\$ 5	\$ 184	\$.50	\$ 6

1073 COUNTER TERMINAL - Model 2

[No longer available ... orders are on an "as available" basis]

Purpose: Unit for terminating pulse input points and/or pulse duration input points in a 1078 Pulse Counter ... each unit has a maximum capacity of 60 points.

Highlights: Input points may be customer contact or voltage source ... input points are ordered in groups of ten (see "Special Features"). Designed for mounting in standard 19" relay rack ... connected to 1078 via special cable (up to 10') furnished by IBM.

PREREQUISITES: A 1078, plus one Counters, Group of Ten (#2410) for each group of ten input terminations.

Maximum: Three per 1078.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Cable: Use 1070 Cable Order Form -- length of cable between 1073 mdl 2 and 1078.

PRICES: Mdl	MAC/ MRC	Purchase	MMMC
1073 2	\$ 16	\$ 704	\$.75

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Per Call: 2

SPECIAL FEATURES

INPUT TERMINATIONS, CONTACT (#4681). A group of ten points for addressing and terminating inputs from customer contact sources. Contact closures, sensed by an IBM supplied voltage of +48 V DC, must have a minimum duration of 16 milliseconds, and an interval between consecutive closures of at least 16 milliseconds. **Maximum:** Sixty points per 1073 mdl 2. This maximum is reduced by ten points for each Input Terminations, Voltage (#4682) also ordered for the 1072 mdl 2. **Limitation:** 5 inputs assigned to Pulse Duration Telemetry require a complete group of ten points. **Prerequisite:** Installation of Input Terminations 31 to 60 require a Terminal Extension (#7936).

INPUT TERMINATIONS, VOLTAGE (#4682). A group of ten points for addressing and terminating inputs from customer voltage sources. Any pulse must have a minimum duration of 16 milliseconds, a minimum interval between pulses of 16 milliseconds, an off-level (nominal voltage level) of -30 V to +1 V DC, and an on-level of +12 V to +48 V DC. **Maximum:** Sixty points per 1073 mdl 2. This maximum is reduced by ten points for each Input Terminations, Contact (#4681) also ordered for the 1073 mdl 2. **Limitation:** 5 inputs assigned to Pulse Duration Telemetry require a complete group of ten points. **Prerequisite:** Installation of Input Terminations 31 to 60 require a Terminal Extension (#7936).

TERMINAL EXTENSION (#7936). Required for installation of Input Terminations 31-60. **Maximum:** One per 1073 mdl 2.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Input Terminations Contact (group of 10) #4681	\$ 3	\$ 89	\$.25	\$ 4
Voltage (group of 10) 4682	2	52	.25	4
Terminal Extension 7936	5	211	.50	2

1073 DIGITAL-PULSE CONVERTER - Model 3

[No longer available ... orders are on an "as available" basis]

Purpose: Unit for buffered pulse or pulse duration output in a 1070 Process Communication System.

Highlights: Accepts a three digit value (000-999) from the 1071 ... when the "execute circuit" is activated, the digital value is converted into an equal number of contact closures of proportional contact closure duration ... optional read back check before "execute" command ... interlock during "execute" prevents readdressing before conversion is complete ... pulse output rate of 90 pulses per second ... output multiplexing via L.C.O. points in a 1073 mdl 1.

Designed for mounting in standard 19" relay racks ... the standard unit operates from a 12 V DC power source to facilitate use with backup battery power.

PREREQUISITES: Display Attachment (#3345) on the 1071, plus available I/O Switching Module (#4663) addresses on a 1072 ... each 1073 mdl 3 uses four 1072 addresses assigned to Digital Output.

Maximum: Depends upon number of available addresses in I/O Switching Modules (#4663) on 1072s.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1073-1072), (b) length of Data cable (1073-junction with Display Attachment cable), and, if required, (c) length of Data cable (1073-junction with Digital Input Channel cable) for each 1073 mdl 3 ordered. **NOTE:** Address cable is a special cable, purchased at \$1.15 per foot and installed by the customer. Data cables are special cables, purchased at \$1.90 per foot and installed by the customer.

PRICES: Mdl	MAC/ MRC	Purchase	MMMC
1073 3	\$ 58*	\$2,200	\$6.50*

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Per Call: 2

SPECIAL FEATURES

AC POWER SUPPLY (#8680, 8684, 8686). For operation from one of the following 1-phase, 60 Hz power sources -- #8680 for 115 V, #8684 for 208 V, or #8686 for 230 V. (Locking plugs).

1073 Digital-Pulse Converter - Model 3 (cont'd)

EXTERNAL OUTPUT CONTROL (#3864). Enables the 1073 mdl 3 to control the duration of an externally synchronized operation ... i.e., proportional blending systems, fluid delivery systems, etc. External contact closures decrement the 1073 mdl 3 output register to zero ... 1073 Latching Contact Operate Points (#4781) provide program control of External Output Control use.

VARIABLE OUTPUT SPEED (#8675). Provides program controlled selection of one of the following output rates -- 96, 48, 24, 12, 6, 3, 1.5 or 0.75 pulses per second. **Note:** Requires one additional 1072 address assigned to Digital Output.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
AC Power Supply				
115 V	#8680	\$ 16	\$ 689	\$ 1.50
208 V	8684	16	689	1.50
230 V	8686	16	689	1.50
External Output Control	3864	5	211	.50
Variable Output Speed	8675	10	423	.50

1074 BINARY DISPLAY

[No longer available ... orders are on an "as available" basis]

Purpose: Unit for display of process on-off conditions and other on-off information received from the data processing system associated with a 1070 Process Communication System.

Highlights: Has ten pairs of lamps for display of on-off conditions ... each pair of lamps (one green, one amber) is individually addressable ... can be set -- green on, amber on, or both on ... error lamp lights when 1071 detects improper data transmission ... each pair of lamps may be labeled by the customer (lamp test feature provides simple visual check for faulty lamps) ... standard unit operates from a 12 V DC power source to facilitate use with backup battery power.

PREREQUISITES: Display Attachment (#3345) on the 1071, plus available I/O Switching Module (#4663) addresses on a 1072 ... each pair of lamps uses one address assigned to Digital Output in an I/O Switching Module.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1074-1072) and (b) length of Data cable (1074-junction with Display Attachment cable) for each 1074 ordered. **NOTE:** Address cable is a special cable, purchased at \$1.15 per foot and installed by the customer. Data cable is a special cable, purchased at \$1.90 per foot and installed by the customer.

PRICES: Mdl	MAC/ MRC	Purchase	MMMC
1074 1	\$ 33	\$1,275	\$3.00

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Per Call: 2

SPECIAL FEATURES

AC POWER SUPPLY (#8680, 8684, 8686). For operation from one of the following 1-phase, 60 Hz power sources -- #8680 for 115 V, #8684 for 208 V, or #8686 for 230 V AC. (Locking plugs)

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
AC Power Supply				
115 V	#8680	\$ 16	\$ 689	\$1.50
208 V	8684	15	689	1.50
230 V	8686	15	689	1.50

1075 DECIMAL DISPLAY

[No longer available ... orders are on an "as available" basis]

Purpose: Unit for display of decimal information received from a data processing system associated with a 1070 Process Communication System.

Highlights: Displays four decimal digits as determined by the data processing system ... each digit is individually addressable ... four additional digits can be added (see "Special Features").

An error lamp indicates improper data received by the 1071 ... each display position may be labeled by the customer ... the standard unit operates from a 12 V DC power source to facilitate use with backup battery power.

PREREQUISITES: Display Attachment (#3345) on the 1071, plus available I/O Switching Module (#4663) addresses on a 1072 ... each display position uses one address assigned to Digital Output in an I/O Switching Module.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1075-1072) and (b) length of Data cable (1075-junction with Display Attachment cable) for each 1075 ordered. **Note:** Address cable is a special cable, purchased at \$1.15 per foot and installed by the customer. Data cable is a special cable, purchased at \$1.90 per foot and installed by customer.

PRICES: Mdl	MAC/ MRC	Purchase	MMMC
1075 1	\$ 68	\$2,615	\$6.00

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Per Call: 2

SPECIAL FEATURES

AC POWER SUPPLY (#8680, 8684, 8686). For operation from one of the following 1-phase, 60 Hz power sources -- #8680 for 115 V, #8684 for 208 V, or #8686 for 230 V AC. (Locking plugs)

ADDITIONAL DISPLAY MODULE (#3348). Four additional display positions. **Note:** Requires four additional addresses assigned to Digital Output in an I/O Switching Module.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
AC Power Supply				
115 V	#8680	\$ 16	\$ 689	\$1.50
208 V	8684	15	689	1.50
230 V	8686	15	689	1.50
Add'l Display Module	3348	38	1,485	3.00

1076 MANUAL BINARY INPUT

[No longer available ... orders are on an "as available" basis]

Purpose: Unit for operator entry of on-off conditions to a data processing system associated with a 1070 Process Communication System.

Highlights: Has ten 2-position switches for entry of on-off data ... each switch is individually addressable ... position of switch remains as last set ... each switch position may be labeled by the customer ... an execute button requests associated processor attention ... an execute lamp informs the operator that a transaction has been completed.

PREREQUISITE: Available I/O Switching Module (#4663) addresses on a 1072 ... each switch position and the execute button uses one address assigned to Digital Input in an I/O Switching Module.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1076-1072) and (b) length of Data cable (1076-junction with Digital Input Channel cable) for each 1076 ordered. **Note:** Address cable is a special cable, purchased at \$1.15 per foot and installed by the customer. Data cable is a special cable, purchased at \$1.90 per foot and installed by the customer.

PRICES: Mdl	MAC/ MRC	Purchase	MMMC
1076 1	\$ 29	\$1,120	\$ 3.50

Plan Offering: Plan B Purchase Option: 50% Maintenance: C
Warranty: B Per Call: 2

1077 MANUAL DECIMAL INPUT

[No longer available ... orders are on an "as available" basis]

Purpose: Unit for operator entry of decimal data to a data processing system associated with a 1070 Process Communication System.

Highlights: Has six switches for entry of six decimal digits of information ... each switch is individually addressable ... position of switch remains as last set ... each switch position may be labeled by the customer ... an execute button requests associated processor attention ... an execute lamp informs the operator that a transaction has been completed.

PREREQUISITE: Available I/O Switching Module (#4663) addresses on a 1072 ... each switch position and the execute button uses one address assigned to Digital Input in an I/O Switching Module.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Cables (when ordered from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1077-1072) and (b) length of Data cable (1077-junction with Digital Input Channel cable) for each 1077 ordered. **Note:** Address cable is a special cable, purchased at \$1.15 per foot and installed by the customer. Data cable is a special cable, purchased at \$1.90 per foot and installed by the customer.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1077	1	\$ 31	\$1,185	\$ 3.50
Plan Offering: Plan B		Purchase Option: 50% Maintenance: C		
Warranty: B		Per Call: 2		

1078 PULSE COUNTER

[No longer available ... orders are on an "as available" basis]

Purpose: Unit for counting events or rates represented by pulses or switch closures for up to 180 customer input devices in a 1070 Process Communication System.

Highlights: Provides for up to 180 five-position pulse counters ... pulse rates of up to 30 per second ... continuous parity checking of each counter position ... up to 18 (6 standard) scan groups provide variable length read-out control ... pulse duration and telemetered pulse duration options with selectable resolution ... counters are ordered in groups of ten ... counters may be read by the system in predetermined groups, or Read and/or Reset using programmable addressing for greater flexibility ... see "Special Features."

PREREQUISITES: Multi-character Input (#5185) on the 1071, plus available I/O Switching Module (#4663) addresses on a 1072 ... each 1078 uses one 1072 address assigned to Digital Input and at least one 1072/1073 in which Input Terminations are ordered as special features.

Maximum: Depends upon number of available addresses in I/O Switching Modules (#4663) on 1072s.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage (AC, 1-phase, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V, unless DC Power Supply Adapter (#3217, 3218) is ordered ... see "Special Features."

[2] Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1078-1072) ... (b) length of Data cable (1078-junction with Digital Input Channel cable) ... (c) length of second Data cable if Selective Read/Reset (#6050) and/or Consecutive Read/Reset (#6051) are ordered (1078-junction with Display Attachment Features cable) for each 1078. **Note:** Address cable and Data cable are special cables, purchased at \$1.90 per foot and installed by customer.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1078	1	\$249	\$8,220	\$10.00
Plan Offering: Plan B		Purchase Option: 60% Maintenance: C		
Warranty: B		Per Call: 2		

SPECIAL FEATURES

COUNTERS (#2410). A group of ten 5-position counters ... each group of ten counters is assigned to any one of the following input modes at time of installation:

Pulse Count -- accumulates number of input pulses or switch closures.

Pulse Duration -- accumulates duration of input pulses or switch closures at a resolution of 107 or 10.7 pulses per second. **Note:** Pulse Duration (#5868) is required to use this mode. Resolution is assigned at time of installation.

Pulse Duration Telemetry -- alternately accumulates the duration of each pulse or switch closure in two counters ... thus the last complete pulse duration value is preserved ... resolution of 107 or 10.7 pulses per second. **Note:** Pulse Duration (#5868) and Pulse Duration Telemetry (#5869) are required to use this mode. Resolution is assigned at time of installation ... each pulse duration telemetry input uses two 5-position pulse counters.

Maximum: 18 per 1078, counter groups may be assigned to the three input modes in any combination.

DC POWER SUPPLY ADAPTER (#3217, 3218). For operation of the 1078 from +12 or +24 V DC power to permit use with backup battery power. #3217 -- for +24 V ... #3218 -- for +12 V. FIT: 1 hr.

PULSE DURATION (#5868). Causes all counter groups assigned to the pulse duration mode to accumulate 107 or 10.7 counts per second during the time corresponding customer inputs are actuated. Either counting rate (107 or 10.7 counts/second) is selected for all pulse duration counters at time of installation.

PULSE DURATION TELEMETRY (#5869). Causes all counter groups assigned to the pulse duration telemetry mode to accumulate, alternately in two consecutive counters, 107 or 10.7 counts per second during the time corresponding customer inputs are actuated. Counting rate depends upon Pulse Duration (#5868) setting. Each counter is limited to 4 digits with this feature, the fifth position is used as a flag. **Prerequisite:** Pulse Duration (#5868).

READ/RESET, SELECTIVE (#6050). For selecting a single pulse counter to request either a readout or a reset operation. Provides access to the 3-digit counter address register (000 to 179) and a 1-digit function control register in the 1078. A control digit "2" sent to the function control register will reset the counter specified in the counter address register. No control digit is required for a readout operation. The possible 4-digit output control messages require four 1072 addresses assigned to Digital Output mode and the Display Attachment (#3345) on the 1071. Input data from the 1078 is accepted via a 1072 address assigned to Digital Input mode. **Prerequisites:** Display Attachment (#3345) on the 1071 and five 1072 addresses, four assigned to Digital Output and one to Digital Input.

READ/RESET, CONSECUTIVE (#6051). Used in conjunction with Selective Read/Reset (#6050) to permit program addressable groups of pulse counters to be read or reset. Provides access to the 3-digit "Stop" address register to receive an ending pulse counter address which stops the operation after its initiation at the Selective Read/Reset start address. Two additional functions are added to the function control register ... a "1" digit establishes the consecutive readout mode for the next read operation only ... a "4" digit resets those counters specified, from the start address through the stop address. **Prerequisites:** Selective Read/Reset (#6050) and three 1072 addresses assigned to Digital Output.

SCAN GROUPS (#6370). A module of six groups which provide variable length readout of 1078 counters. Each scan group defines a start and stop address selected at time of installation ... basic 1078 includes six Scan Groups. **Maximum:** Two ... 12 additional Scan Groups. **Prerequisite:** One 1072 address assigned to Digital Input for each Scan Group.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FC
Counters, group of 10 #2410	\$ 5	\$ 169	\$.25	\$ 4
DC Power Supply Adapter				
for +24 volts 3217	10	423	1.50	55
for +12 volts 3218	10	423	1.50	55
Pulse Duration 5868	10	423	1.00	26
Pulse Duration, Tlmt 5869	10	343	.25	18
Read/Reset, Selective 6050	31	1,025	1.50	3
Read/Reset, Consec 6051	11	465	.25	3
Scan Grps, module of 6 6370	5	204	.25	9



1201 PROOF INSCRIBER

[No longer available ... features, model conversions, RPQs and accessories are not affected.]

Purpose: Performs all functions, except subtraction, of an 803 Proof Machine ... plus document inscribing.

Models: Models with or without endorsing and various pocket capacities are available, as follows:

Model	Endorsing	Number of Pockets		Selector Key Arrangement
		Operative	Inoperative	
1	Yes	1-32	None	4 rows of 8
A1	Yes	1-24	25-32	4 rows of 6, or 3 rows of 8
B1	Yes	1-16	17-32	2 rows of 8, or 2 rows of 6, plus 1 row of 4
2	No	1-32	None	4 rows of 8
A2	No	1-24	25-32	4 rows of 6, or 3 rows of 8
B2	No	1-16	17-32	2 rows of 8, or 2 rows of 6, plus 1 row of 4
3	Yes	1-24	None	4 rows of 6
B3	Yes	1-16	17-24	2 rows of 6, plus 1 row of 4
4	No	1-24	None	4 rows of 6
B4	No	1-16	17-24	2 rows of 6, plus 1 row of 4

Model Changes: Changes from endorsing to non-endorsing models, and vice versa, can be made between the following models: 1 and 2 ... A1 and A2 ... B1 and B2 ... 3 and 4 ... B3 and B4. For other changes, see Branch Manager Letter 348.

Highlights: List, distribute, prove, inscribe, and (mdls 1 and 3) endorse checks, deposit slips, batch control slips and similar documents in one operation. Each pocket holds about 150 documents. See 803 for proof machine functions. Intermixed card and paper documents within the following specifications can be inscribed: Length - 6" to 8-3/4" (paper) or 4.852" to 8-3/4" (card) ... Width - 2-3/4" to 3-2/3" ... Thickness - .003" to .007".

Inscribing - recommendations of the American Bankers Association are used. Two fields can be inscribed in magnetic ink on face of documents in a 1/4" band parallel to and 3/16" up from bottom edge. Spaced 8 characters/inch, starting approximately 5/16" from right edge. Type font is E13B. Fields are, from right to left: Amount - set up on adding keyboard and inscribed as ten digits bracketed by amount symbol ... Process Control - established by setting levers mounted in top cover of machine and inscribed adjacent to amount. Used to identify types of transactions or batches of work. Distribution pocket totals, as well as process control codes, can be inscribed on control slips during compartment total printing operations. **NOTE:** If desired, up to four process control positions are supplied at no charge ... see "Specify."

Endorsing - endorsing models can endorse documents with date, identification numbers and bank's legal endorsement. The Endorser Plate is made to the customer's specifications. See "Accessories" below. A Blank Endorser Plate is also available if only partial endorsements are required. When ordering #3792 attach Endorser Plate Specification (~~2120-1340~~) ... not required for #3793.

Control Panel - has hubs for Inscribe Suppress and Process Control Suppress, plus hubs for all 803 functions.

Supplies: Magnetic Transfer Ribbon and Endorsing Roll. Each magnetic transfer ribbon provides about 13,300 line impressions.

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

Specify: [1] Voltage (AC, 1-phase, 60 Hz, locking plug): #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V.

[2] Process Control: If desired, #9190 for 1 position, #9191 for 2, #9192 for 3, or #9193 for 4 ... number of positions can be changed or eliminated

[3] Endorsing (mdls 1, A1, B1, 3, B3 only): See "Endorsing" under "Highlights."

[4] Selector Key Arrangement: Mdls A1, A2 - #9771 for 4 rows of 6 keys, or #9772 for 3 rows of eight keys. Mdls B1, B2 - #9773 for 2 rows of 8 keys, or #9774 for 2 rows of 6 keys plus 1 row of 4 keys.

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
1201	1	\$ 419	\$11,880	\$99.50
	A1	385	11,880	99.50
	B1	347	11,880	99.50
	2	410	11,340	93.50
	A2	372	11,340	93.50
	B2	333	11,340	93.50
	3	385	10,260	85.50
	B3	347	10,260	85.50
	4	372	9,720	80.00
	B4	333	9,720	80.00

Plan Offering: Plan B Purchase Option: 50% Maintenance: C
Warranty: B Per Call: 1

SPECIAL FEATURES

PROCESS CONTROL, ADD'L (#5701, 5702). Up to four digits are standard ... see "Specify" above. Up to two add'l digits can be installed. #5701 - for fifth digit ... #5702 - for sixth. **Prerequisite:** For #5701 - #9193 ... for #5702 - #5701.

Special Feature Prices:	MAC/MRC	Purchase	MMMC	FC
Process Control, Add'l fifth digit	#5701 \$ 5	\$ 206	\$1.00	\$77
sixth digit	5702 5	206	1.00	5

Accessories: The following items are available on a purchase only basis for mdls 1, A1, B1, 3 and B3 only. For shipment with machine, order the desired Feature # indicated below at the price listed in M 10000 pages.

Endorser Plate (#3792).
Blank Endorser Plate (#3793).

Note: When ordering #3792, it is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

See M 10000 pages for description, ordering instructions and field installation.



DP Machines

1203 UNIT INSCRIBER

[No longer available ... features, RPQs and accessories are not affected.]

Purpose: Key-operated machine for printing numerals and special symbols on checks and other documents in magnetic ink ... combined with functions of an adding machine.

Highlights: Continuous high-speed proving possible with a 10-key electric adding machine which prints individual amounts and totals on a paper tape. At the same time, document can be inscribed with an amount field, a process control field, and be fully or partially endorsed and serial numbered ... see Serial Numbering/Endorsing (#3791) under "Special Features."

Speed depends upon operator and type of work processed. Has one stacker and one 10-position net balance accumulator which accumulates 11-position totals. Storage space provided for documents which cannot be processed. Intermixed card and paper documents within the following specifications can be inscribed: Length - 6" to 8-3/4" (paper) or 4.852" to 8-3/4" (card) ... Width - 2-3/4" to 3-2/3" ... Thickness - .003" to .007".

Inscribing - recommendations of American Bankers Association are used. Two fields can be inscribed in magnetic ink on face of documents in a 1/4" band parallel to and 3/16" up from bottom edge. Spaced 8 characters/inch, starting approximately 5/16" from right edge. Type font is E13B. Fields are, from right to left: Amount - set up on adding keyboard and inscribed as ten digits bracketed by amount symbol ... Process Control - established by setting knobs in top cover of machine, inscribed adjacent to amount field as one to four digits. Used to identify types of transactions or batches of work. Machine total and process control codes can also be inscribed on control slips during total printing operations. **NOTE:** If desired, up to four process control positions are supplied at no charge ... see "Specify."

Document Counter - a six position counter ... reset manually.

Supplies: Magnetic Transfer Ribbon, Disposable Ink Roll, Adding Machine Unit Ribbon and Adding Machine Paper Roll. Each Magnetic Transfer Ribbon provides about 13,300 impressions.

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

Specify: [1] Voltage (AC, 1-phase, 60 Hz): Locking plug - #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug - #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Process Control: If desired, #9190 for 1 digit, #9191 for 2, #9192 for 3, or #9193 for 4 ... number of positions can be changed or eliminated

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1203	1	\$ 169	\$4,140	\$ 70

Plan Offering: Plan B Purchase Option: 50% Maintenance: C
Warranty: B Per Call: 1

SPECIAL FEATURES

ACCOUNT NUMBER FIELD INSCRIBER (#1012). Inscribes a fixed-length account number and "On-U's" symbols. Field can be any one length from 5 to 10 digits, as specified by customer.

Specify: #9210 for 5 digits, #9211 for 6, #9212 for 7, #9213 for 8, #9214 for 9, or #9215 for 10.

SERIAL NUMBERING/ENDORSER (#3791). Imprints full or partial endorsement and serial number. Endorsement prints fixed distance (about 1-1/4") from bottom of document. Operator can select left or right horizontal printing position. Serial number consists of 4 automatic advancing positions separated from 2 manually-set positions by a selectable blank or dash. Serial number advance available in any one of the following options: [1] Advance one digit on credit feed (subtract key depression) ... [2] Advance one digit on zero balance test (sub-total key depression) ... [3] Advance one digit on each document feed ... [4] Advance one digit on manual key control. Advancing method will be set by CE at installation or as required subsequently by customer. With this feature, documents can be endorsed with date, identification number and bank's legal endorsement. The etched Endorser Plate is made to the customer's specifications. See "Accessories" below. A Blank Endorser Plate is also available if only partial endorsements are required. **Note:** The old Endorser on 1203s shipped prior to July 1, 1964 may be changed to the new feature by ordering #3791. A new Endorser Plate must also be ordered. On purchased machines, the new feature may be substituted for the old one at no charge except for the Field Installation Charge and price of the new Endorser Plate ... see "Accessories" below and M 10000 pages. When ordering #3792

attach Endorser Plate Specification ... not required for #3793.

NON-ZERO BALANCE TEST (#5350). Depression of Sub-total Key automatically locks keyboard if accumulated total is not zero.

PROCESS CONTROL, ADD'L (#5701, 5702). Up to four digits are standard ... see "Specify" above. Up to two add'l digits can be installed. #5701 - for fifth digit ... #5702 for sixth digit.

Prerequisites: For #5701 - #9193 ... for #5702 - #5701.

TRANSIT NUMBER FIELD INSCRIBER (#8020). Inscribes Transit-Routing numbers, dash and transit symbols.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Acct No. Field Inscribe #1012	\$20	\$ 505	\$2.00	\$276†
Serial Number/Endorse 3791	20	413	6.50	106
Non-zero Balance Test 5350	5	160	2.00	39
Process Control, Add'l				
fifth digit 5701	5	174	1.00	52
sixth digit 5702	5	174	1.00	52
Transit Number Field				
Inscriber 8020	20	505	3.00	316††

Accessories: The following items are available on a purchase only basis. For shipment with machine, order the desired Feature # indicated below at the price listed in M 10000 pages.

Endorser Plate (#3792).
Blank Endorser Plate (#3793).

NOTE: When ordering #3792, it is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

See M 10000 pages for description, ordering instructions, and field installation.

† \$135 if #8020 is already installed.
†† \$174 if #1012 is already installed.

**1230 OPTICAL MARK SCORING READER****Purpose:** Used to score objective tests or questionnaires.**Highlights:** Positionally marked test forms, questionnaires, surveys, etc., are automatically scored at a rated speed of 1,200 documents/hour. Scores are digitally accumulated for number of right, wrong or omitted answers. Scores are printed on right margin of answer sheets in one of two operator selected positions.

The unit has solid state circuits. It optically reads ordinary #2 pencil marks and marks made by a 1403 Printer, a 1443 Printer mdl 1 or 2 with a 52- or 63-character type bar with arrangements A, H or K, a 1443 mdl N1 or 2203 mdl A1 with a 52- or 63-character type bar, or a 5203 Printer. The 1403/5203 print chain or train or the 1443/2203 type bar must be equipped with an enlarged dash which replaces the standard dash. See "Type Catalog." Double threshold recognition distinguishes between marks and erasures.

A correctly marked answer sheet is used to store correct responses and program controls internally. Answer sheets are fed from a pneumatically controlled hopper with a 600-sheet capacity, through the scoring area, and directed to one of two stackers. The main stacker has a capacity of 600 answer sheets. Sheets with detected errors are directed to a separate stacker with a 50-sheet capacity. Answer sheets are stacked in reverse sequence in both stackers.

Answer Sheets - 8-1/2" x 11" ... up to 1,000 response positions printed on a side ... 2,000 positions when printed on both sides. Preprinted response positions are printed in rows of 20 positions. Each row is divided into two 10-position groups. Each 10-position group is called a word for the purpose of defining an answer area. The maximum of 100 words per answer sheet can be divided into various combinations of scorable parts. The answer sheet can accommodate a maximum of 400 two-part questions ... 200 three-, four- or five-part questions ... or 100 six- to ten-part questions. Successive words can be designated for identification number as necessary to accommodate customer requirements. When an identification number is used on a two-sided answer sheet, it must be marked on both sides.**Supplies:** An electric typewriter ribbon (1136238) or its equivalent, is used for printing scores.

For printing marks, use IBM ribbon 1136430 or 1136940 on the 1403 (all mdls), 422536 on the 1443/2203, 1136990* on the 5203, or equivalent ribbons capable of producing acceptable marks.

Accessory: A Hand Punch (171787) is available for punching scoring keys to manually score mutilated answer sheets ... see IRD sales manual.**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1621.**Specify:** [1] Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Kickstrips: #9431 ... field installable. When kickstrips are installed, the open area under the machine is enclosed. This reduces the amount of "toe-room" for the operator and may be inconvenient to the customer if the power outlet is located under the machine.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	1230	1	\$ 238	\$12,060
				\$46.50

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Per Call: 2**SPECIAL FEATURES****CARD PUNCH ATTACHMENT (#1620).** To cable-connect a 534 Card Punch mdl 3 for punching identification number, part scores, and item responses into a standard 80-column card. All information to be punched is stored as bits in a sonic delay line storage unit until transferred to the card punch. The duplicating feature of the punch can be used to duplicate common data such as date, school number, test number, etc. into all the cards. Up to 42 columns of data may be punched while maintaining a throughput of 1,200 sheets/hour. Throughput decreases progressively as the number of columns punched increases. Throughput is approximately 750 sheets/hour when punching 80 columns of data. When not used with the 1230, the 534 can be used as an independent card punch ... see 534 for details.**COUNTER, FORMULA (#2398).** An additional counter which can be controlled to add, subtract and transfer its contents to the standard counter. Can be programmed to accumulate Rights, Wrongs, or Rights minus (N) Wrongs, where N can be equal to 1, 1/4, 1/3 or 1/2. Also provides for counting as right answers as many responses (up to five) to a test item as have been program-

* Available via price request

med as possible right answers to the item. **Maximum:** One. **Limitation:** Cannot be installed with Counter, RWO (#2399).**COUNTER, RWO (#2399).** An additional counter which can be controlled to count the number of Rights, or Wrongs, or Omits, and transfer its contents to the standard counter. **Maximum:** One. **Limitation:** Cannot be installed with Counter, Formula (#2398).**ID FIELD CHECKING (#4609).** Provides the capability of checking words in the identification field for one of the following conditions: blank, multi-marks, or other than one mark. ID field is defined as all words programmed to read prior to first end of field mark. No scoring of test answers can take place in the ID field. **Prerequisite:** Card Punch Attachment (#1620).**STORAGE (#7467).** Used as intermediate buffering device which allows the counter to be cleared immediately after completion of a part score ... permits the counter to be reused for additional scoring without sacrificing answer sheet space. **Maximum:** One.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC	
Card Punch Attach	#1620	\$129	\$6,185	\$3.00	\$ 52
Counter, Formula	2398	42	2,485	4.00	66
Counter, RWO	2399	21	1,240	4.00	52
ID Field Checking	4609	7	321	1.00	29
Storage	7467	21	1,240	2.50	52

1231 OPTICAL MARK PAGE READER**Purpose:** Reads marked data from 8-1/2" x 11" data sheets directly into a 1401 (except A or H mdls), 1440 (except with 1441 mdl A2), 1460 or S/360 mdl 22, 25, 30, 40 or 50.**NOTE:** For use with the 1130 system, see GSD manual.**Model 1** For use with 1401, 1440 or 1460.**Model N1** For use with S/360 mdl 22, 25, 30, 40 or 50.**Model Changes:** Cannot be made in the field.**Highlights:** Data sheets are fed from a pneumatically controlled hopper with a 600-sheet capacity, through the reading area, and directed to one of two stackers. The main stacker has a capacity of 600 sheets. Sheets with detected errors are directed to a separate stacker with a 50-sheet capacity. Documents are stacked in reverse sequence in both stackers.

Data to be read can be placed on data sheets with ordinary #2 pencils, or by a 1403 Printer, a 1443 Printer mdl 1 or 2 with a 52- or 63-character type bar with arrangement A, H or K, a 1443 mdl 1 or 2203 mdl A1 with a 52- or 63-character type bar, or a 5203 Printer. The 1403/5203 print chain or train or the 1443/2203 type bar must be equipped with an enlarged dash which replaces the standard dash. See "Type Catalog."

1401, 1440, 1460 - documents are read at varying speeds, dependent upon the mode switch setting. When set to "Continuous," feeding is at a constant speed of 2,000 documents/hour. When set to "Demand," feeding is controlled by computer program, with speeds varying up to 1,600 documents/hour. The feeding mode selected depends upon the computer program control method used. The 1231 mdl 1 can be located up to 25 feet from the processor.**S/360** - documents can be read at a maximum constant rate of 2,000 documents/hour. Actual throughput depends upon computer programming. Sheets are fed upon command from the computer. Data is transferred to the processor by operation of the channel to which the 1231 is attached.**Data Transmission:****1401, 1440, 1460** - all marks read from a data sheet are stored as bits in a sonic delay line storage unit until transferred to the processor by execution of a read instruction. Less than 10 milliseconds are required to transfer data from the delay line to processor storage.**S/360** - marks read from the data sheet are stored in the 1231 mdl N1 by word and are transferred to the processor by operation of the channel to which the 1231 is attached.**Data Sheets** - 8-1/2" x 11" ... up to 1,000 mark positions printed on a side ... 2,000 positions when printed on both sides. Preprinted mark positions are printed in rows of 20 positions. Each row is divided into two 10-position groups. Each 10-position group is called a word for the purpose of defining a marking area. Each word can be divided into two 5-position segments. Data words and segments can be grouped in various combinations to form fields for recording the source data.**PREREQUISITES:****For 1401, 1440, 1460** - a Serial I/O Adapter (#7080) on the 1401 or 1441 Processing Unit ... in a 1401, diagnostic programs require at least 4,000 positions of core storage.**For S/360** - up to four 1231 mdl N1s can be attached to a



1231 Optical Mark Page Reader (cont'd)
system ... each requires a channel control unit position.

S/360 mdl 25 - special feature on 2025: Multiplexer Channel, or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 - standard multiplexer channel, or Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.
[NOTE: If the 1231 is attached to a multiplexer channel, special consideration must be given to priority.]

Limitations:

S/360 mdl 25, 30 - operation of 1231s is not included under 1401/1440/1460 Compatibility Features.
S/360 mdl 40 - operation of 1231s is not included under the 1401/1460 Compatibility Feature (#4457).

Supplies: For printing marks, use IBM ribbon 1136430 or 1136940 on the 1403 (all models), 422536 on the 1443/2203, 1136990* on the 5203, or equivalent ribbons capable of producing acceptable marks.

Bibliography: 1401/1460 - GA24-1495, 1440 - GA24-3005, S/360 - GC20-0360.

Specify: [1] Voltage (AC, 1-phase, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Color (mdl N1 only): #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Kickstrips: #9431 ... field installable. When kickstrips are installed, the open area under the machine is enclosed. This reduces the amount of "toe-room" for the operator and may be inconvenient to the customer if the power outlet is located under the machine.

[4] Isolation Feature: May be required on units shipped prior to December 29, 1967 ... see "Special Features."

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1231	1	\$ 485	\$20,520	\$ 47
	N1	549	23,760	54

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Warranty: B Purchase Option: 45% Maintenance: C
Metering: I/O Unit (online) Per Call: 2

SPECIAL FEATURES

ISOLATION, CONTROL UNIT (#4700). [For field installation only on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 1231 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** In all cases there are compatible EC level requirements.

MASTER MARK (#5045). A master data sheet, containing up to 10 words of marked data, can be read by the 1231. The master data sheet is identified by a special preprinted mark and contains data that is to be associated with all subsequent data sheets until a new master sheet is read. Thus, data common to a series of data sheets need be recorded and read only once. When used with a 1401, 1440 or 1460, the 1231 mdl 1 stores master mark data on the sonic delay line and transfers the data with the data for each subsequent detail sheet ... when used with a S/360, the 1231 mdl N1 transfers master mark data only one time, as it is being read from the master mark sheet.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Isolation, Control Unit #4700	NC	NC	NC	NC
Master Mark	5045 \$ 54	\$2,225	\$1.50	\$ 77

1232 OPTICAL MARK PAGE READER

Purpose: Reads marked data from 8-1/2" x 11" data sheets into a 534 Card Punch mdl 3 for punched card output.

PREREQUISITE: A 534 Card Punch mdl 3.

Highlights: Data sheets are fed from a pneumatically controlled hopper with a 600-sheet capacity, through the reading area, and directed to one of two stackers. The main stacker has a capacity of 600 sheets. Sheets with detected errors are directed to a separate stacker with a 50-sheet capacity. Documents are stacked in reverse sequence in both stackers.

Data to be read can be placed on data sheets with ordinary #2 pencil, or by a 1403 Printer, a 1443 Printer mdl 1 or 2 with a 52- or 63-character type bar with arrangement A, H or K, a 1443 mdl N1 or 2203 mdl A1 with a 52- or 63-character type bar, or a 5203 Printer. The 1403/5203 print chain or train, or 1443/2203 type bar must be equipped with an enlarged dash which replaces the standard dash. See "Type Catalog."

A 534 Card Punch mdl 3 is cable-connected to the 1232 to punch data read from the data sheets. All marks read from a document are stored as bits in a sonic delay line storage unit until transferred to the card punch. The duplicating feature of the card punch can be used to duplicate common information into a group of cards. When not used with the 1232, the 534 can be used as an independent card punch ... see 534 for details.

Documents are read at varying rates of speed, depending upon how many card columns are punched into a card. Throughput ranges from approximately 850 to 2,000 documents/hour.

Data Sheets - 8-1/2" x 11" ... up to 1,000 mark positions printed on a side ... 2,000 positions when printed on both sides. Pre-printed mark positions are printed in rows of 20 positions. Each row is divided into two 10-position groups. Each 10-position group is called a word for the purpose of defining a marking area. If Segmented Word (#6405) is installed, each word can be divided into two 5-position segments. Data words and segments can be grouped into various combinations to form fields for recording the source data.

Supplies: For printing marks, use IBM ribbon 1136430 or 1136940 on the 1403 (all models), 422536 on the 1443/2203, 1136990* on the 5203, or equivalent ribbons capable of producing acceptable marks.

Manuals: See "IBM Marketing Publications KWIC Index," G320-1621.

Specify: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Kickstrips: #9431 ... field installable. When kickstrips are installed, the open area under the machine is enclosed. This reduces the amount of "toe-room" for the operator and may be inconvenient to the customer if the power outlet is located under the machine.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1232	1	\$ 353	\$14,400	\$60.50

Plan Offering: Plan B Purchase Option: 45% Maintenance: C
Warranty: B Per Call: 2

SPECIAL FEATURES

MASTER MARK (#5045). A master data sheet, containing up to 10 words of marked data, can be read and stored on the delay line for punching into output cards. The information read from the master sheet is retained on the delay line until a new master data sheet is read. The master data sheet is identified by a special preprinted mark and contains data that is to be associated with all subsequent data sheets until a new master sheet is read. Thus, data common to a series of data sheets need be recorded and read only once.

MULTIPLE SPREAD CARD (#5262). For punching up to four cards for each data sheet read. Each card will be numbered sequentially by a punch in column 1. Any or all of the following can be punched into each card: master sheet data [if Master Mark (#5045) is installed] ... page or identification data ... and a portion of the detail data from the data sheet in spread card form.
Limitation: Cannot be installed with Unit Record Card (#8580).

SEGMENTED WORD (#6405). For punching data from a word or segment into a single card column. A two-position mode switch marked "Segment" and "Word" controls mode of operation. When set to "Segment," marks in positions 0 thru 4 are punched in one card column and marks in position 5 thru 9 are punched in the next card column. When set to "Word," marks in positions 0 thru 9 are punched in one card column.

UNIT RECORD CARD (#8580). For punching a separate card for each field on the data sheet. Cards will be punched only for those fields containing marks. Each card can contain: master sheet data [if Master Mark (#5045) is installed] ... identification data (page number, order number, salesman's number, etc.) ... field number (to identify item) ... and marked detail data (quantity, etc.).
Limitation: Cannot be installed with Multiple Spread Card (#5262).

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Master Mark	#5045 \$ 54	\$2,225	\$2.00	\$77
Multiple Spread Card	5262 32	1,330	2.00	44
Segmented Word	6405 32	1,330	1.00	21
Unit Record Card	8580 42	1,775	2.00	44

Document Inspection Gauge: One is furnished with each 1230, 1231 or 1232 as a Customer Engineering tool. Used for checking printing alignment on data sheets. additional gauges (628848).

* Available via price request

**1255 MAGNETIC CHARACTER READER**

Purpose: Sorts documents, used in banking and other applications, meeting specifications under "Highlights" below. Available as a stand alone sorter, or with an appropriate attachment feature, reads magnetic character data into a 2770 system in home or line mode, into a S/360 mdl 22, 25, 30, 40, 50, a S/370 mdl 115 thru 158, 3031 Processor, or a 4331 or 4341 Processor.

For use with System/3, System/32, System/34 and S/360 mdl 20, see GSD manual.

- Model 1** Reads and/or sorts up to 500 six-inch documents per minute into six stackers.
- Model 2** Reads and/or sorts up to 750 six-inch documents per minute into six stackers.
- Model 3** Reads and/or sorts up to 750 six-inch documents per minute into twelve stackers.

Model Changes: Field installable only between mdl 1 and mdl 2.

Highlights: Actual sorting and processing speeds depend upon length of document, paper quality, atmospheric conditions, and/or 2772 terminal and transmission limitations, or host system limitations. Reads all fields and sorts on any field.

Uses a new, lower cost, single gap MICR reading technique, providing MICR capabilities for smaller volume operations. Reading performances may differ from other reader sorters. Pre-installation runs of actual documents are strongly recommended to determine expected performance. The input hopper holds 5-1/2" of documents in a gravity feed permitting non-stop feeding. Models 1 and 2 each have six horizontal stackers in one vertical bay, while model 3 has twelve horizontal stackers arranged in two vertical bays of six stackers each. Individual stackers have a document capacity of 2-1/2". The transport mechanism opens for access to the document path. An operator-resettable total document counter is provided.

Designed for ease of operation and operator training. The operator panel, feed hopper and stackers are in a compact area for operator convenience and minimum space requirements.

In addition to performing the basic modulus 10 or 11 checking function, the self-checking number/improved recognition feature, when installed and operative, is integrated with the MICR reading circuitry to reduce account number rejects and substitutions. This field is especially subject to folds, banding, and print specification deviations. Rejects and character substitutions will be reduced in proportion to the severity of document degradations, thus reducing customer reconciliation expense.

Sorting -- for mdls 1 and 2, offline sorting uses five sort stackers and one reject stacker for a two-phase digital sort. Phase 1 sorts even digits, rejecting odd digits which are sorted in phase 2. This conforms to the sort pattern of other six-stacker sorters and permits the start of phase 2 sorting without removing phase 1 documents from the stacker. If Alternate Sort Pattern (#9301) is specified, digits 0-4 sort in phase 1 and digits 5-9 sort in phase 2.

For mdl 3, one-phase sorting on digits 0-9 with rejects directed to stacker "R" at top of first bay. Stacker "A" at top of second bay is used to select items when the High Order Zero and Blank Column Selection feature is installed.

Online 2770 systems operation suspends sorting, automatically alternating between two stackers on a stacker full condition, with the rejecting of invalid documents.

Stacker selection is under program control when operating online to a computer system.

Field Lengths -- the amount field and transit-routing field are fixed length ... the process control field and serial number field are variable length ... the account number field may be fixed or variable length. See "Specify" below.

Checking -- readability of each magnetic character and special symbol, and the field length check on fixed-length fields, are checked on all fields designated by the operator for reading into the system or terminal in the online mode, or on all fields designated for checking in the offline mode. When attached to the 2770 system, error documents are automatically rejected by the 1255 and data is not transferred to the 2772 buffer.

MICR E13B Printing -- the type font, print quality, and code line arrangement on the documents must meet the specifications recommended by the American Bankers Association Technical Committee on Check Handling. The specifications and related data are available in booklets 147R3 and the Supplement to 147R3, both of which are available at a nominal charge from the American Bankers Association, 1120 Connecticut Avenue NW, Washington, D.C. 20036.

Documents -- intermixed paper and card documents (including travelers checks) within the following specifications can be processed:

Width -- 2.5" to 4.25"

Length -- 5.75" to 8.875"

Thickness -- .003" to .007"

Paper Stock -- 20 lb. to 44 lb. (card stock)

Carrier documents, enclosing a non-processable item, up to .013" in thickness may be processed.

Document Evaluation -- documents must be evaluated at least six months prior to installation to determine whether the level of print quality is acceptable to the customer, with time for corrective action if necessary. Sub-standard E13B quality may cause excessive rejects and character substitutions.

Transmission -- when used with the 2770 system, the 1255 reads into the two 2772 buffers, automatically stopping and alternating between buffers on a specified number of documents. Buffer Expansion (#1490) is required on the 2772. The number of records (documents) held by the buffer is determined by the maximum record length for the fields selected for reading. The records/buffer is set at 4, 6, 8, 10 or 12. The records/buffer may be changed by the CE, but is not subject to customer control. In online transmission and pretransmission verification operations, reading characters in excess of the maximum record length specified causes an error condition. The following options are available:

Maximum Record Length (including special symbols)	Records/buffer
53	4
41	6
30	8
24	10
20	12

Balance-List (#1470) facilitates pretransmission balancing to batch total tickets of stacked batches. In Mode A, operating under 1255 speed limitations, the feature totals the Amount Field on good items and prints the good item total, batch ticket total, and derived difference on the 2770 system printer. In Mode B, under 2770 system printer speed limitations, good items are detail listed with the same total cycles as Mode A. Documents are listed with limited print editing and limited columnar formatting.

PREREQUISITES:

For 1255 -- all documents must be mechanically jogged prior to each pass through the machine ... joggers are available from commercial sources. A sorting tray is recommended.

For 2770 -- one 1255 can be attached to a 2770 system. 1255 Attachment (#9755) and Buffer Expansion (#1490) are required on the 2772 ... 2772 Adapter (#7850) is required on the 1255 itself. See "Special Features." For audit, maintenance, error recovery and application procedures, the 2770 system must include a printer.

For S/360 mdl 22, 30, 40, 50, a S/370 mdl 115 thru 158, 3031 Processor, or a 4331 or 4341 Processor -- one 1255 can be attached to a system ... requires a channel control unit position ... a byte multiplexer channel is recommended. The 1255 should normally be the highest priority device on the channel. System/360/370 Adapter (#6360) is required on the 1255 ... see "Special Features." Direct Control (#3274) or External Interrupt (#3895) is required on the processing unit. *There are no special features required on the 4341 Processor to attach the 1255.* External Signal (#3898) is required on the 3115, 3125, and the 4331 Processor.

S/360 mdl 25 -- special feature on the 2025: Multiplexer Channel, or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/370 mdl 115, 125 -- Byte Multiplexer Channel (special feature), External Signal (#3898) ... see 3115, 3125. On a 3115-0, #9336 is required.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channels (special features) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), block multiplexer channels (special feature) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

3031 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031.



1255 Magnetic Character Reader (cont'd)

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional).

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (2 are standard).

Limitations: For S/360, S/370 or 4300 Processors -- the 1255 is not supported by any 1400 or 7000 series compatibility features. The 1255 is not supported by the Model 20 Compatibility Feature (#7520) on the 3115, 3125.

Bibliography: 2770 -- GA24-3089, S/360 -- GC20-0360, S/370 -- GC20-0001.

Specify: [1] Voltage (AC, 1-phase, 60 Hz): For stand alone and use with 2770 system; Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V ... Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V. For use with S/360, S/370 or 4300 Processors; #9902 for 208 V, or #9904 for 230 V. Must be consistent with system voltage ... specify code consistent with system/voltage for pre-system installation.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Alternate Sort Pattern: #9301, if desired. Replaces the standard even/odd pattern with the 0-4/5-9 pattern. See "Sorting" under "Highlights." May be changed in the field

[4] Account Number Field Length: Specify one # from the table below. A fixed field length assures maximum processing accuracy. However, a variable field length may be specified in lieu of a fixed length. Length of the account field length may be changed in the field

FIXED FIELD LENGTH (positions)	5	6	7	8	9	10	VARIABLE LENGTH FIELD
ACCOUNT NUMBER	#9210	#9211	#9212	#9213	#9214	#9215	#9219

[5] Superior Reading Performance: Self-checking Number/ Improved Recognition (#7060) is recommended ... see "Highlights" above and "Special Features" below.

[6] Use with 2770: Transmission Code -- #9761 for EBCDIC, or #9762 for ASCII ... must be consistent with 2772 code. May be changed in the field. **PREREQUISITE:** 2772 Adapter (#7850) ... see "Special Features" below.

[7] Use with S/360 mdls 22, 25, 30, 40, 50 or S/370 mdls 115 thru 158, a 3031 Processor, or a 4331 or 4341 Processor -- System/360/370 Adapter (#6360) is required ... see "Special Features" below.

[8] Kickstrips: #9431, if desired. Field installable. NOTE: When installed, the open area under the machine is enclosed. This reduces the amount of "toe-room" for the operator and may be inconvenient to the customer if the power outlet is located under the machine.

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
1255	1	\$ 904	\$35,460	\$251
	2	1,100	40,590	400
	3	1,450	55,260	527

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Metering: I/O Unit (Online/Offline) Maintenance: C
Warranty: B Purchase Option: 40% Per Call: 2
Useful Life Category: 2

SPECIAL FEATURES

BALANCE-LIST (#1470). [For use on 2770 system only] For pre-transmission balancing of stacked document batches. Accumulates the total of good items, with or without detail listing ... a batch total ticket initiates terminal printing of the good item total, batch ticket total, and net difference. Invalid items are rejected. In totaling mode, documents are checked for the maximum characters per document specified for transmission. In listing mode, a different number of characters per document may be specified on installation. In listing mode, selected fields are printed in document order with limited print editing ... the amount field is right justified with decimal insertion and high order zero suppression ... other fields are left justified in columns tabulated on the terminal printer ... special symbols, except dashes and the right amount field symbol, are indicated with substitute printer symbols. Selected fields, other than the process control field, missing from the document causes fields to print in alternate columns. **Limitation:** The feature is not operative during line transmission or fine sorting operations. **Prerequisites:** 2772 Adapter (#7850) ... the 2770 system must include a printer or display unit. **Field Installation:** Yes.

DASH SYMBOL TRANSMISSION (#3215). Transmits the E13B

dash symbol from transit field to storage. With symbol in storage, the program can distinguish between duplicate foreign and U. S. transit numbers. **Field Installation:** Yes.

51-COLUMN CARD SORTING (#4380). Model 1 -- for reading and sorting 51-column card documents. When installed, machine speed is reduced to approximately 405 dpm for six-inch documents. For 51-column cards, speed is approximately 500 dpm. Models 2 and 3 -- when installed, machine speed is reduced to approximately 605 dpm for six-inch documents. For 51-column cards, speed is approximately 750 dpm. **Note:** For optimum performance on all models, card documents should be separated out from standard size ABA documents on first pass operations. **Field Installation:** Yes.

HIGH ORDER ZERO & BLANK SELECTION (#4520). This permits selection to pocket A of documents during a digit sort having only blanks or zeros in the sort position and in all higher order positions of the field. **Limitation:** Available on the mdl 3 only ... operates offline only. **Field Installation:** Yes.

S/360/370 ADAPTER (#6360). To attach the 1255 to the Multiplexer Channel (#5248) on the 2025, 3115, 3125 or 4331, or the standard multiplexer channel on the 2022, 2030, 2040, 2050, 3135, 3135-3, 3138, 3145, 3145-3, 3148, 3155, 3158, 3031 or 4341. **Field Installation:** Yes.

SELF-CHECKING NUMBER/IMPROVED RECOGNITION (#7060). For reducing rejects and substitutions caused by defects in the account number field and for checking Modulus 10 or 11 self-check digit account numbers up to 10 positions long, including the self-check digit and dashes. SLT pluggable card wiring determines the modulus calculated and weighting factor for each digit. SLT card is removed and inserted by the CE for customer wiring. An operator panel on/off switch is the only customer control of the feature. The self-check digit may be in any position, always using a weighting factor of 1. Modulus 10 will check any weighting factor 0 thru 9, summing the product digits, and checking for an even multiple of 10. Modulus 11 will check any weighting factor, summing the products and checking for either an even multiple of 11, or for a constant remainder of 4.

This feature, when installed and operative, replaces the basic character substitution checking circuitry with the more accurate modulus 10 or 11 checking circuitry while the account number field is being read. Documents with marginal printing that might normally be rejected as potential substitutions will be processed if all characters pass the self-checking digit test, thus reducing the chances of a reject. All account numbers that fail the self-checking digit test will cause the document to reject, thus reducing the chances of a substitution. Since the account number field is frequently subject to folds, banding, mutilation and print specification deviations, rejects and substitutions will be reduced in proportion to the severity of document degradation. **Field Installation:** yes.

2772 ADAPTER (#7850). To attach the 1255 to a 2772 Control Unit. A switch (adjacent to the self-checking number switch) is provided which permits listing documents previously rejected to determine which field and which character caused the reject. **Field Installation:** Yes.

Special Feature Prices:	MAC/MRC	Purchase	MMMC	FIC	
Balance-List	#1470	\$ 75	\$2,990	\$ 7.00	\$ 343
Dash Symbol Transmis	3215	56SUC	35	NC	21
51-Column Card Sorting	4380	16	661	NC	93
High Order Zero & Blank Selection	4520	33	1,315	5.00	157
S/360/370 Adapter	6360	506	19,800	37.00	1,255
Self Checking Number/ Improved Recognition	7060	54	2,135	2.50	173
2772 Adapter	7850	48	1,915	3.00	323



1260 ELECTRONIC INSCRIBER

Purpose: A key operated unit for proving deposits, sorting and listing of checks into eight individual stackers, and MICR inscribing of checks and deposits in the ABA recommended E13B format.

Highlights: The ten-key keyboard permits fast, accurate, touch amount entry for sorting, listing, proving, inscribing and, with Endorsing and Serial Numbering (#3791), endorsing checks in a single operation. Has eight machine distribution stackers and detail tapes. Three or five external stackers are provided for non-processable documents ... see "Specify" below.

Intermixed card and paper documents within the following specifications can be inscribed: Length -- 5.750" to 9.000", plus 51-column cards ... Width -- 2.750" to 3.750" ... Thickness -- .003" to .007".

All arithmetic functions are accomplished by a single electronic accumulator which has a ten-digit addition, subtraction and accumulation capability. Electronic storage is provided to store the following data and totals: Thirteen distribution totals, nine of which develop item count (maximum, 9999) [see Additional Totals (#1071) under "Special Features"] ... group debit total ... group net total ... grand total ... second field storage and/or adding machine total ... serial number (control tape - maximum 99999) ... deposit item count (maximum, 9999) ... grand total item count (maximum, 10 digits).

Inscribing -- as standard, two fields can be inscribed in E13B font on the face of documents in the clear band field. The fields are, from right to left: Amount -- set up in the amount keyboard and inscribed as ten digits bracketed by the amount symbol ... Process Control -- emitted under program and selector key control and inscribed adjacent to the amount for identification of transaction or batch. Deposit item count total also inscribes in the process control field on deposit tickets. Distribution totals with automatic process control codes identifying the stacker and item count totals are inscribed on control documents. Six positions of process control inscribing and printing are standard. For Routing and Transit, and Account Number, see "Special Features" below.

One cycle automatic group balance with efficient multiple credit ability provides printout of total debits and net debit/credit difference on non-balance.

Automatic high dollar selection may be accomplished through program wiring to override normal selector key operation and sort, add and list checks of \$1,000.00 and over into pocket number 8.

Programs -- three programs may be stored in the machine and are selected by a dial program switch. One set of program cards is shipped with each machine. A second set will be provided, if specified ... see "Specify" below. A third set is also available ... see "Special Features."

Supplies -- Magnetic Transfer Ribbon, Endorsing Ink Roll, and paper and ribbon supplies ... each Magnetic Transfer Ribbon provides approximately 33,000 line impressions.

Manuals -- see "IBM Marketing Publications KWIC Index," G320-1621.

Specify: [1] Voltage (AC, 1-phase, 60 Hz, locking plug): #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] External Stackers: #9686 for three, or #9687 for five.

[4] Up-ending Kit: #9840, if required ... loan basis, remains property of IBM.

[5] Program Cards, Second Set: #9552, if required

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1260	1	\$ 308	\$11,700	\$119

Plan Offering: Plan B Purchase Option: 40% Maintenance: C
Warranty: B Per Call: 1

SPECIAL FEATURES

ACCOUNT NUMBER FIELD (#1010). Permits inscribing of the amount, process control, and account number in one pass of the document. Operation is similar to that of the Routing and Transit Field (#6300), in that the account number may be transferred to storage and inscribed in the same pass as the amount and process control field. A repeat key and a means of clearing the storage are provided. Includes an additional setup key adjacent to the ten-key keyboard which allows the operator to set a blank or dash in either the account number or routing and transit field.

ADDITIONAL TOTALS (#1071). Adds sufficient counters to provide a total of 20 distribution totals, each with a 4-digit item count. These counters are used and controlled in the same manner as the normal distribution counters in the basic machine.

Limitation: Cannot be installed with Automatic Float Analysis (#1294, 1296).

AUTOMATIC FLOAT ANALYSIS (#1294, 1296).

#1294 -- designed to be used with the Routing and Transit Field if the deposit ticket has not been pre-printed. A 4-digit serial number is printed in the field on the deposit ticket and is repeated in the four high-order positions of the field on each float document.

#1296 -- designed to be used when the Routing and Transit Field on the deposit ticket has been pre-printed with the bank number. No printing will occur in the field on the deposit ticket, but 5555 is printed in the four high-order positions of the field on each float document.

Either #1294 or #1296 permit from one to six float amounts in dollars and cents (10 digits) and corresponding item counts (4 digits) to be classified and accumulated under program control wiring and selector key control as the debit items are processed for proof of deposit. The activity of programmed float classes is detected, so that when the balance status of the deposit is established as the deposit ticket is processed, the developed float data can be inscribed. Operator feeding of one float ticket is required for each two classes of float developed. No documents or machine cycles are required for inactive float accumulators. When this feature is installed, the total number of assignable counters is 20, each with an associated 4-digit item count. When the "Float" switch is "OFF," these may be used as normal distribution counters ... when the switch is "ON," only 14 of these are available as distribution counters. **Maximum:** One, #1294 or #1296. **Limitation:** Cannot be installed with Additional Totals (#1071).

CHECKER SIGNAL (#1935). A light signal under switch control that provides the operator with a means of signalling a supervisor.

ENDORISING AND SERIAL NUMBERING (#3791). The endorsement prints at random in an area approximately 3" wide. In addition to printing the bank's endorsement stamp, a date, a 5-digit machine, batch or branch identification, and a 5-digit serial number is provided. The serial number may be programmed in advance for each document fed, or to advance for each deposit. The serial number printed on the check is also printed on the control tape to provide a complete audit trail. With this feature, documents can be endorsed with date, identification number and bank's legal endorsement. The etched Endorser Plate is made to the customer's specifications. See "Accessories" below. A Blank Endorser Plate is also available if only partial endorsements are required. When ordered #3792 attach Endorser Plate Specification ... not required for #3793.

HIGH VOLUME TOTAL (#4603). To print one quick kill total in the Routing and Transit Field of the deposit ticket. The quick kill total will print in the normal Routing and Transit format with a dash symbol separating the four high-order and four low-order digits. This feature assumes only one float level of quick kill items. **Limitation:** Cannot be installed with Transit Analysis (#8016).

PROCESS CONTROL KEYBOARD (#5705). Consists of two rows of keys, numbered blank thru 9, located to the right of the ten-key keyboard. Used either to key in a special transaction code, or to override any two digits of the emitted process control code.

ROUTING AND TRANSIT FIELD (#6300). Permits printing of the Routing and Transit Field as well as the Amount Field and Process Control Field in one pass of the document. The field is keyed in the ten-key keyboard and transferred into a storage area. The amount is then keyed and the document dropped into the check chute. The document will be positioned at the inscribing station, the amount will be inscribed and process control if programmed. The document will advance to the Routing and Transit Field and the field will be inscribed. A "Routing and Transit" key and means of clearing the routing and transit storage are provided.

SHIFT IDENTIFICATION SWITCH (#7138). A dial switch, labelled OFF-1-2-3, that provides the operator with a means of identifying a shift number in any one of the five positions of the Distribution Total Identification number. The switch is located adjacent to the program switch.

THIRD PROGRAM (#7948). Provides program cards, wires and overlays for a third program. **Prerequisite:** Program Cards, Second Set (#9552) ... see "Specify" above.

TRANSIT ANALYSIS (#8016). To print two float figures in the Routing and Transit Field of the deposit ticket. The four high-order digits of the field will inscribe one class of float in hundreds of dollars ... the last four (or low-order) digits of the field will inscribe a second class of float in hundreds of dollars. The feature uses two of the standard distribution amount accumulators. **Limitation:** Cannot be installed with High Volume Total (#4603).



1260 Electronic Inscrber (cont'd)

Special Feature Prices:		MAC/ MRC	Purchase	MMMC	FIC
Account Number Field #1010	\$ 17	\$ 551	\$4.00	\$ 91	
Additional Totals	1071	17	551	5.50	23
Auto Float Analysis	1294	34	1,060	5.50	32
Auto Float Analysis	1296	34	1,060	5.50	32
Checker Signal	1935	25SUC	25	NC	92
Endorse & Serial Num	3791	17	689	6.00	100
High Volume Total	4603	10	321	1.50	23
Process Control Keybd	5705	17	551	1.50	66
Routing & Transit Field	6300	17	551	4.00	91
Shift Identification Sw	7138	2	73	NC	27
Third Program	7948	3	123	NC	15
Transit Analysis	8016	13	482	3.50	23

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the desired Feature # indicated below at the price listed in M10000 pages.

- Endorser Plate (#3792)
- Blank Endorser Plate (#3793)

NOTE: When ordering #3792, it is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

See M10000 pages for description, ordering instructions, and field installation.

1282 OPTICAL READER CARD PUNCH

Purpose: Optically reads numeric data and three special characters from printed 51- or 80-column cards and punches the data read into the same card at a maximum rate of 200 cards/minute.

Highlights: The digits 0-9 and three special characters, plus (+), dash (-) and a solid vertical line (|), are read at a character recognition station. A maximum of 32 characters can be read and punched during a single pass. Unreadable information is automatically rescanned up to two times. Standard card punching, punch suppression, special symbol punching, gang punching, zero insertion, and double punch-blank column detection are determined by control panel wiring. A program card is premarked by the user to control field selection. A line selection device permits operator selection of any one of eight to ten horizontal line positions on the forms, depending upon the type of font to be read. Self-checking number detection is controlled by the premarked program card and control panel wiring.

Printing: For efficient operation, the printing to be read must conform to the specifications established for the 1282. Cards can be printed by a 1403 Printer mdl 1, 2, 3, 7 or N1, 1404 Printer mdl 2, IBM Selectric® Typewriter mdl 721, 723 or 725, and IBM Standard Electric Typewriter mdl C. They can also be created by any imprinters which produce the specified print quality.

The standard machine can be ordered to read any two of the following (see item [2] under "Specify"): [1] 1428 front reading for typewriters, 1403 and 1404 ... [2] 1428 enlarged front reading for imprinters ... [3] 1428 enlarged reverse reading for imprinters.

The 1403 and 1404 normally print 10 characters per inch (10 pitch). However, there is no restriction on the pitch of printing to be read other than that it be no greater than 10 pitch. Any number of characters less than 10 pitch per inch can be read. Adjacent fields can have differing pitch.

Documents: Both 51- and 80-column cards can be processed, but only one size can be processed at a time. Additional document considerations, relating to the printing device, recommended ribbons, and type styles, are specified in the table below.

Standard Features: One single-section, 22-hub, self-contacting control panel with complement of wires (see "Specify" below) ... a 1,200-card capacity hopper ... a lens selector knob [a 2-position selector to change between the reading of either enlarged font (1428 or Farrington 7B) or 1428 standard font] ... a digit emitter ... a character reading station ... a rescan feature ... self-checking number detection ... twenty positions of DPBC detection ... two document counters ... two radial stackers, each with a 1,000-card capacity ... charcoal covers and a white operator console.

Manuals: See "Catalog of Marketing Publications KWIC Index," G320-1621.

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9884 for 208 V, or #9886 for 230 V (locking plugs only).

- [2] Characters to be Read: Specify one of the following:
 - #9090 -- for 1428 standard front reading and 1428 enlarged front reading.
 - #9091 -- for 1428 standard front reading and 1428 enlarged reverse reading.
 - #9092 -- for 1428 enlarged front reading and 1428 reverse reading.
- [3] Test Decks: One or both of the following test decks must be specified unless Farrington 7B Font Recognition (#3950, 3952) is ordered ... to test the machine, either #9719, 9720 or Farrington 7B Font test documents must be used, depending upon the application.
 - #9719 -- for 1428 enlarged front test deck ... #9090 or #9092 above is required.
 - #9720 -- for 1428 enlarged reverse test deck ... #9091 or #9092 above is required.
- [4] Scan Line Boundary: Specify one -- #9576 for right edge, #9577 for left edge, or #9500 for center. **LIMITATION:** #9500 cannot be specified with #9092 above.
- [5] Control Panel: Specify one -- #9081 for self-contacting with manual wires, #9082 for self-contacting with fixed wires, or #9084 for no panel or wires ... specify #9084 for all mechanical replacement machines.
- [6] Extended Memory: #9145, if applicable. Provides for storing the variable wheel amount field (5-digit only) or account number field when a rescan is necessary to read the other field. **NOTE:** Will not operate with other than a 5-digit variable wheel amount field. Can be field installed.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1282	1	\$1,848	\$64,080	\$339

Plan Offering: Plan B Purchase Option: 45% Maintenance: C
Warranty: B Per Call: 2

SPECIAL FEATURES

ALTERNATE FIELD CONTROL (#1250). To select fields for reading under control of hand-printed vertical field mark.

DOUBLE PUNCH AND BLANK COLUMN DETECTION (#3435). An additional group of 20 positions. **Maximum:** One group.

EXPANDED FIELD SUPPRESSION (#3833). Basic machine permits punch suppression of up to four fields, each containing a maximum of 12 character positions ... this feature increases the number of punch suppression control fields to six ... it is prerequisite for Optical Mark Reading (#5480-5484).

FARRINGTON 7B FONT RECOGNITION (#3950, 3952). To read and punch documents printed in Farrington 7B Font by credit plate imprinters. #3950 -- without Bar Code or Alpha Blanking ... #3952 -- with Bar Code and Alpha Blanking. **Specify:** Either or both -- #9714 for front reading test deck, #9716 for reverse reading test deck.

OPTICAL MARK READING (#5480-5484). Information marked on cards in addition to printed characters can be read and converted to punched holes. Similar to mark sensing, but location of marking positions and type of marking pencil differ. See Manual GA24-3106 for details. **Specify:** One of the following -- #5480 for 5 positions, 80-column card, front field ... #5481 for 6 positions, 80-column card, front field ... #5482 for 12 positions, 80-column card ... #5483 for 5 positions, 80-column card, center field, and 51-column card ... #5484 for 6 positions, 80-column card, center field, and 51-column card.

Prerequisite: Expanded Field Suppression (#3833).

SELF-CHECKING NUMBER FIELD CORRECTION (#7065). Operates in conjunction with the standard self-checking number error detection feature. Documents with a single unreadable character in a self-check field ordinarily are rejected. This feature automatically corrects a single unreadable character and makes the document acceptable. Documents with more than a single unreadable character are rejected. This feature is not recommended for use with imprinter applications.

SERIAL NUMBER PUNCHING (#7090). To punch consecutive numbers from one to five digits in length in ascending or descending sequence. The first number to be punched is manually set by the operator.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Alternate Field Control #1250	\$ 23	\$ 734	\$ 3.00	\$ 45
DPBC Detection 3435	35	1,090	5.50	66
Expanded Field Suppress 3833	17	551	1.50	62
Farrington 7B Font Recognition				
no bar code or alpha blk 3950	166	6,050	3.50	76
bar code & alpha blank 3952	166	6,050	3.50	76
Optical Mark Reading				
5 pos, 80 col, front fld 5480	166	5,425	13.00	104
6 pos, 80 col, front fld 5481	166	5,425	13.00	104
12 pos, 80 col 5482	215	7,300	16.00	138
5 pos,80/51 col,cntr fld 5483	166	5,425	13.00	104
6 pos,80/51 col,cntr fld 5484	166	5,425	13.00	104
Self-chk No. Field Corr 7065	125	4,365	3.00	32
Serial Number Punching 7090	105	3,735	6.00	84



1282 Optical Reader Card Punch (cont'd)

Printing Unit		Recommended Ribbon/ Carbon Paper (or equivalent)	Type Style Required for Reading by 1282
Other Than S/360	1403 mdl 1 or 2	MYLAR (424325)/Nylon (414486)	1428 Type Style, J4 (#9599)
	1416 (1403 mdl 3)	Nylon (414486)	1428 Type Style, J4 (#9599)
	1404 mdl 2	Nylon (419031)	1428 Type Style, J4 (#9599)
S/360	1403 mdl 2 or 7	MYLAR (424325)/Nylon (414486)	1428 Type Style, AN4 (#9621)
	1416 (1403 mdl 3 or N1)	Nylon (414486)	1428 Type Style, AN4 (#9621)
	1404 mdl 2	Nylon (419031)	1428 Type Style, AN4 (#9621)
Available thru OPD	Model C - IBM Electric Typewriter with Keyboard 069	Nylon No. 50 (1010655) 5121 Polyethylene (1010760)	Type Code 097, Type Mark VA5 Type Code 096, Type Mark VA8
	Selectric Typewriter mdl 721, 723 or 725 w Keyboard 009	Nylon No. 50 (1136076)	Type Code 009
Credit Card Imprinter		Carbon paper to be used will be based on the application	1428 Enlarged Font or Farrington 7B Self-check

**1287 OPTICAL READER**

Purpose: Optically reads machine printed numeric digits, alphabetic characters, special symbols and handprinted numeric digits and certain alphabetic characters into a S/360 mdl 22, 25, 30, 40, 50, 65, 65MP, 67 (in 65 mode), 75, any S/370 Processor (1287 mdl 5 only on 115 and 125), or any 4300 Processor. Machine printed or handprinted character reading dependent on model and features. See "Special Features."

- Model 1** Can read multiple lines of numeric printed data from cut form paper or card documents.
- Model 2*** In addition to reading multiple lines of numeric printed data from cut form paper or card documents, can also read data from continuous rolls of paper (journal tapes) ... machine design permits easy operator change-over from document to tape handling, and vice versa, in a matter of seconds.
- Model 3** Identical to model 1, with the added capability of reading ANSCS OCR Size A font character set specified in the "Table of Acceptable Characters."
- Model 4*** Identical to model 2, with the added capability of reading alphameric ANSCS OCR Size A font character set specified in the "Table of Acceptable Characters."
- Model 5** Can read multiple lines of numeric handprinted digits and certain alphabetic characters from cut form paper or card documents.

Model Changes: Cannot be made in the field.

Highlights:

All Models -- the basic machine includes an input hopper with a capacity for an 11-inch stack of documents, an optical read station, a document transport, and three output stackers each with a capacity for 4 inches of documents. Documents are fed, one at a time, under program control to the read station where each document is held stationary while it is scanned and read by an electronic flying spot optical scanner. Documents can range in size from 2.25" x 3" to 5.91" x 9".

Format control flexibility is provided under S/360, S/370 or 4300 Processor program control to allow reading variable length fields in any sequence. Depending on model and feature mix, fields may contain machine printed, typewritten, imprinted, or handprinted characters, oriented in either of two directions on the same document. The stored program directs the beam, a field at a time, to the data to be read. Information is scanned from right to left (units to high order) and fed serially, a character at a time, to the system channel.

Unreadable characters are automatically rescanned. Unrecognizable characters may be displayed selectively under program control for online correction (except ANSCS OCR characters read in alphameric mode), or they may be transmitted to the processor as the standard EBCDIC substitute character code (use of "@" symbol is available on RPQ) for possible programmed correction or reconstruction. The document remains in the read station until ejected under processor program control. Final disposition of each document into one of three output stackers (A, B or R) is controlled by the program. Stackers A and B can be used for selecting two classes of documents. Stacker R is normally used for selecting documents with unrecognizable characters. Automatic overflow between stackers A and B can be used to extend the length of document runs without stopping the machine.

All models provide the following features:

- Multi-line, normal and plus 90 degrees reading of numeric 1428 or ANSCS OCR Size A type fonts produced by high speed printers and IBM SelectricR typewriters, and reading of imprinted (1428 E or ANSCS OCR Size C fonts) or handprinted numeric digits and certain alphabetic characters from documents.
- Format flexibility under processor program control.
- Automatic rescan of unreadable characters.
- Cathode ray tube character display with selective online correction of unreadable numeric characters from the operator keyboard.
- Document counter.

Model 1 or 2 -- the digits 0-9 and the alphabetic characters C, N, S, T, X, Z printed in 1428 font, plus a special preprinted vertical field mark symbol, can be recognized ... or the digits 0-9 and the three abstract symbols, "hook", "fork" and "chair" printed in the American National Standard Character Set for Optical Character Recognition (ANSCS OCR) font, plus the special preprinted vertical field mark symbol, can be recognized.

Model 3 or 4 -- the alphameric ANSCS OCR character set de-

scribed in the "Table of Acceptable Characters - 1287" below and the characters described for mdl 1 or 2 can be read.

Model 5 -- the handprinted digits 0-9 and alphabetic characters C, S, T, X and Z and numbers preprinted in Gothic 3/16" can be recognized.

Features for Model 5 are:

- Numeric handprinting basic font.
- Alternate NHP character Read-Verify Mode selectable under program control.
- Keyboard and Display Console for online correction.
- Hopper Preload Tray.
- Stacker Foot Treadle start-stop control.
- Background color contrast.

Speed (Documents) -- maximum document throughput depends upon document size, the number of characters and fields to be read (machine printed, handprinted, mark read), printed character registration or alignment, use of online correction, and the processor program. For full details, including speed formula, see SRL GA21-9064 and GA21-9150.

Maximum document throughput can range from 665 documents per minute for a 3" long stub with one field of 20 machine-printed characters, to less than 100 documents per minute for a 6" long document containing 50 fields of handprinted characters.

Documents and Printing (all models) -- for optimum operation, print quality must conform to quality specifications established for the 1287 described in SRL GA21-9064 and GA21-9150. Except for imprinting, only original copy may be processed. Document sizes and weights must conform to those specified in SRL GA21-9064 and GA21-9150. Also see Serial Numbering (#6550, 6555) under "Special Features" for special document size restriction.

Additional document considerations relating to the printing device, recommended ribbons and type styles can be found in SRL GA21-9064 and GA21-9150.

Journal Roll Reading (model 2 or 4 only) -- a journal tape transport permits reading the digits 0-9 and the selected characters C, N, S, T, X, Z and "slash-dash" printed in 1428 Font (#9735 or #4470); 0-9, the selected characters C, N, S, T, X, Z and symbols "hook", "fork" and "chair" printed in ANSCS OCR font Size A (with #9736 or #4470); or the digits 0-9 and six special symbols printed in NCR Optical Type Font (with #5300) from journal rolls. The same reading station described above for document reading is used for reading rolls. A maximum of 38 characters may be read from a single journal roll line. Maximum character spacing is 10 characters/inch. Unreadable characters are automatically rescanned.

The line to be read is positioned automatically and scanned under program control from units to high-order (right to left - read forward orientation) ... tapes may be processed in either direction. The operator can control the fields to be scanned, the font selection and tape processing direction (forward or backward) by manual console settings. Unreadable characters may be corrected online by the operator, or the line containing the unreadable characters may be marked under program control for offline correction.

In addition to all the features of the model 1 and 3, models 2 and 4 provide:

- Forward or backward tape reading.
- Input roll feeding up to 200' capacity.
- Online manual correction of unreadable characters via operator keyboard.
- Line marking of lines containing unreadable characters under program control.
- Easy operator changeover from document to journal tape handling, and vice versa, in a matter of seconds.

Speed (Journal Rolls) -- depends upon the number of characters per line, tape width, line spacing and vertical registration printing accuracy. For full details, including speed formulae, see SRL GA21-9064.

Throughput is affected by online correction and the user's program ... rescan and line marking of lines containing unreadable characters may also affect throughput.

Journal Rolls -- size ranges, and specific journal tape considerations relating to the printing device, ribbons, type styles, paper color, and quality are contained in SRL GA21-9064.

Printing -- for efficient operation, printing must conform to the quality specifications established in the 1287. For optimum operation, black, purple or approved red ink colors should be used ... colors other than black or cash register purple should be referred to the Data Entry Product Center for review. Journal rolls may be prepared by adding machines, cash registers and similar devices. Acceptable type styles are IBM 1428, ANSCS OCR Size A and NCR Optical Font (NOF type style developed by NCR) ... for allowable characters, see "Table of Acceptable Characters" below. For reading NOF type style, NCR Optical Type Font (#5300) is required ... see "Special Features."

Optional Features: Available on models 1, 2, 3, 4 are -- Numeric

* The 1287 Models 2 and 4 are no longer available ... features, model conversions, RPQs and accessories are not affected.



1287 Optical Reader (cont'd)

Handwriting (#5370) including preprinted number recognition of 3/16" Gothic characters, Farrington 7B Font (#3945), 1428 and ANSCS OCR Font (#4470) which permits alternate reading of both fonts in separate, pre-identified fields under program control, and Serial Numbering (#6550). The following are also available: On models 2 and 4 -- NCR Optical Font (#5300) ... on models 3 and 4 -- Expanded Symbol Set (#3850) ... on model 5 -- Machine Printed OCR Font (#4900) which includes alternate reading of numeric 1428, ANSCS OCR and Farrington 7B fonts in separate, pre-identified fields under program control and Serial Numbering (#6555) ... on all models -- Optical Mark Reading (#5479). See "Special Features."

PREREQUISITES: Multiple 1287s, all models in any combination, can be attached to a system ... each 1287 contains its own control unit and requires a channel control unit position.

S/360 mdl 25 -- special feature on 2025: Multiplexer Channel or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), or Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050. For attachment to a S/360 mdl 30, a 2030 mdl D or larger is required.

S/360 mdl 65, 65MP, 67 (in 65 mode), 75 -- basic multiplexer channel of a 2870, Selector Subchannels (special features) of a 2870 ... see 2870.

S/370 mdl 115, 125 -- (1297 mdl 5 only) Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- byte multiplexer channel (standard), Selector Channels (special features), Block Multiplexer Channel (special feature) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- byte multiplexer channel (standard), Selector Channels (first one is standard), Block Multiplexer Channel (special feature) ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- byte multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), Block Multiplexer Channels (first two are standard) ... see 3155, 3158.

S/370 mdl 165, 168 -- basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2870.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional).

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (2 are standard).

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Type Font (mdls 1, 2, 3, 4 only): #9735 for reading 1428 and 1428 E Type Font only, or #9736 for reading the American National Standard Character Set for Optical Character Recognition only ... neither of these are to be specified if 1428 and ANSCS OCR Font (#4470) is ordered. See "Special Features."

[4] Background Color Contrast: #9030, if desired (standard on mdl 5). This feature allows use of darker background colors for outlining numeric handwriting boxes and mark read positions on documents where high visual contrast is desired. Background color is limited to blue range of visual spectrum when printed to maximum intensity permissible with this feature. Consult SRL GA21-9064 and GA21-1950 for description of ink characteristics. The feature is compatible with 1287 approved blue-green to blue range of background colors printed at standard machine maximum intensities. **Limitations:** Not compatible with purple ink journal tape processing (models 2 and 4). Certain background colors approved for the 1287 mdls 1 thru 4 (particularly in the yellow-green range) are not compatible with this feature. The Data Entry Product Center will review existing forms for background ink compatibility with this feature.

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
1287	1	\$2,925	\$ 89,280	\$ 881
	2	3,350	102,240	991
	3	4,505	134,640	1,265
	4	4,930	150,480	1,320
	5	3,670	99,360	1,275

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Warranty: B Purchase Option: 40% Maintenance: C
Metering: I/O Unit (Online) Per Call: 3

SPECIAL FEATURES

EXPANDED SYMBOL SET (#3850). [Mdl 3 or 4 only] To recognize the following eight special symbols when they are created by an IBM Selectric Typewriter, or equivalent: + = { } ? % ' "

FARRINGTON 7B FONT (#3945). [Mdls 1 thru 4 only] For reading characters imprinted on documents by credit plate imprinters in Farrington Selfchek* 7B Font ... see characters shown under "7B - #3945" in "Table of Acceptable Characters - 1287" below.

1428 AND ANSCS OCR FONT (#4470). [Mdls 1 thru 4 only] Provides the ability to read numeric 1428 and ANSCS OCR fonts, each in separate, pre-identified fields of a document ... selection of a font to be read for a specific field or document type is under program control. See characters under "IBM 1428 Font" and "ANSCS OCR" shown in the "Table of Acceptable Characters - 1287" below. On models 2 or 4 only -- reading of 1428 or ANSCS OCR Size A font on journal rolls is interchangeable under operator switch control. **Note:** When this feature is ordered for plant installation, neither #9735 nor #9736 under "Specify" need be specified.

MACHINE PRINTED OCR FONT (#4900). [Mdl 5 only] Provides the ability to read numeric 1428, ANSCS OCR and Farrington Selfchek* Font, each in separate pre-identified fields in a document ... selection of the font to be read for a specific field or document type is under program control. See characters under "IBM 1428 Font," "ANSCS OCR" and "7B" shown in the "Table of Acceptable Characters - 1287" below.

NCR OPTICAL TYPE FONT (#5300). [Mdl 2 or 4 only] For reading characters from journal tapes printed in "NOF" type style developed by NCR. The character shapes shown under "NOF - #5300" in the "Table of Acceptable Characters" below can be read. Reading of this type style and IBM 1428 or ANSCS OCR Size A type style is interchangeable, under operator switch control. This feature also provides the capability to selectively skip the 11-digit account number field in the NCR C-53 NOF journal tape format. Reading or skipping is under console switch control and customer specified characters in columns "1" and "2" on the journal tape. Partial line correction (one-two character keyboard entry) may be performed by the operator when processing NOF tapes. **Specify:** Customer may specify up to three character code combinations in positions "1" and "2" to control selective reading of account number field for NCR C-53 format only. **Note:** If NCR registers' tapes contain Line Finder Character Marks, RPQ is also required.

NUMERIC HANDWRITING (#5370). [Mdls 1 thru 4 only] [Plant installation only] For reading handprinted numeric digits 0-9 and handprinted alphabetic characters C, S, T, X, Z from documents (N is not available) ... C, S, T, Z must be used in the units position of a field ... X can be anywhere. For optimum operation, character shapes and spacing must conform to the basic rules of handwriting as outlined in SRL GA21-9064 and GA21-9150. Information should be handprinted with ordinary #2 pencils or grade HB fine line lead for mechanical pencils. Includes the ability to read numbers preprinted on documents by the forms supplier in Gothic 3/16" font.

OPTICAL MARK READING (#5479). For reading mark entered data from documents. Marks may be oriented vertically, slanted at an angle of 45° as defined for mark reading with the 1418 Optical Character Reader feature codes #4950, #4951 respectively, or drawn horizontally as defined for mark sensing features on the 519 Document Originating Machine. A timing mark is required for each mark read column regardless of the orientation of the marks. Data should be recorded with ordinary #2 pencils.

SERIAL NUMBERING (#6550). [Mdls 1 thru 4 only] Provides the capability of sequentially numbering documents from 00000 to 99999. Printing is done along the trailing edge of the front face of the document after reading. A ten-position numbering head is provided, of which five positions are unit advanced and five are stationary. Selection of documents to be printed is governed by manual control switch setting in conjunction with stacker select commands. Printing in flight is accomplished without decreasing machine throughput. Printing is non-OCR quality. **Ribbons:** The feature uses a black ribbon (1136843) or purple ribbon (1136844), or equivalent. **Limitations:** Cannot be field installed on units below serial no. 10155 shipped from the plant prior to March, 1969 ... machines equipped with

* Trademark of Farrington Manufacturing Company.



1287 Optical Reader (cont'd)

this feature cannot process documents smaller than 3.00" wide x 4.75" long.

SERIAL NUMBERING (#6555). [Mdl 5 only] Function and limitations same as Serial Numbering (#6550) except provides two alternate print positions in a band adjacent to the normal print position. Selection of print position is under manual control ... also provides five stacker-serial numbering control combinations and independent batch numbering document printing control.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Expanded Symbol Set #3850	\$ 73	\$ 2,240	\$ 3.50	\$ 282
Farrington 7B Font #3945	27	799	1.00	119
1428 & ANSCS				
OCR Font	4470	27	799	1.00
Mach Printed OCR Font	4900	541	14,688	29.50
NCR Optical Type Font	5300	104	3,204	5.00
Numeric Handwriting	5370	837	25,632	55.00
Optical Mark Reading	5479	104	3,204	5.00
Serial Numbering	6550	313	9,144	66.00
Serial Number (mdl 5)	6555	313	9,144	66.00

TABLE OF ACCEPTABLE CHARACTERS - 1287

1287 Fonts		#5300 on 1287 mdl 2 or 4	#3945 on 1287 mdls 1 thru 4, or #4900 on 1287 mdl 5	1287 mdl 3 or 4 only ANSCS OCR Size A (10) (11)		1287 mdl 5, or #5370 on 1287 mdls 1 thru 4
#9735 or #4470 on 1287 mdls 1 thru 4, or #4900 on 1287 mdl 5	#9736 or #4470 on 1287 mdls 1 thru 4, or #4900 on 1287 mdl 5			IBM Selectric® Typewriter ††††	3211 (14), 1403 mdls 2,3,7,N1, 3203 (all mdls), or 3800 (15)		Handprinted Char- acter Set (13)
IBM 1428 Font†	ANSCS OCR Sizes A & C	NOF††	7B†††			
0 1 2 3 4 5 6 7 8 9 C N S T X Z | (VFM) (1) / (2) blank (3)	0 1 2 3 4 5 6 7 8 9 C N S T X Z | (LVM) (1) / (2) blank (3)	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9 blank (3)	Basic 1287: 0 A N : 1 B O ; 2 C P . 3 D Q , 4 E R / 5 F S - 6 G T * 7 H U # 8 I V & 9 J W | (7) Y K X - (8) J L Y # (9) H M Z blank With #3850: + % = ? { ' } "	0 A N 1 B O 2 C P . 3 D Q , 4 E R / 5 F S - 6 G T * 7 H U # 8 I V & 9 J W | Y K X J L Y H M Z blank	0 1 2 3 4 5 6 7 8 9 C S T Z X / (12) blank

- † Digits 0-9 only available in 1428 F (Elongated) for imprinting.
- †† National Optical Font shown by permission of National Cash Register Co.
- ††† 7B shown by permission of Farrington Manufacturing Co.
- †††† or equivalent.
- (1) Recognized and transmitted in document mode only (LVM-Long Vertical Mark, VFM-Vertical Field Mark).
- (2) Recognized and transmitted in tape mode only (1428 font).
- (3) No blanks are transmitted in ANSCS OCR Size C, Farrington 7B, or 1428 fonts.
- (4) In 1428 font the characters C, N, S, T, X and Z may only occupy the units position of the field or line.
- (5) In ANSCS OCR Size A font, the characters C, N, S, T, X and Z may only occupy the units position of the lines in journal mode (mdls 2 and 4).
- (6) Only the characters 0-9 are available in ANSCS OCR Size C font.
- (7) For machine printed fields a pre-printed long vertical mark is permitted.
- (8) Group Erase permits ignoring a line or field. Symbol must be at least .300" long overstriking at least one standard height character. It must overstrike the first character on that end of the line on which scanning is initiated.
- (9) Character erase not in the ANSCS OCR Size A character set. Available to ignore a character and its space for typewriters.
- (10) Two reading modes are available, numeric defined and alphameric intermixed. The following characters are available in numeric defined mode:
0 1 2 3 4 5 6 7 8 9 . , / - * # % & ' () (LVM) # and with #3850 + = %
The following characters are available in A/N Intermixed mode:
All numeric defined characters except Y. In addition, A-Z, & ; ' and with #3850, + = { } % ? ' "
- (11) See "Note 5" above for journal mode characters on Model 4.
- (12) C, S, T and Z must be in the units position, X can be anywhere.
- (13) See #5370 under "Special Features" for further details.
- (14) The OCR Print Package (#5450) on the 3211, is a prerequisites for OCR applications. 20-24 lb. bond is recommended for optimum performance. When other papers are used, customer testing should be performed to assure reading performance. Group or character erase feature should be inactive when reading 3211 generated documents.
- (15) Minimum paper weight for documents produced on the 3800 is 20 lb.



1288 OPTICAL PAGE READER

Purpose: Optically reads printed alphabetic and numeric characters and specified symbols on up to page size documents (max. 9" x 14") into a S/360 mdl 22, 25, 30, 40, 50, 65, 65MP, 67 (in 65 mode), all S/370 Processors (except 115 and 125), or all 4300 Processors. With Numeric Handwriting (#5370) it can also read handprinted numeric digits and certain alphabetic characters.

Highlights: The basic machine includes an input hopper with a capacity for up to a 10" stack of documents, a document separator and aligner station, an optical read station, a document transport, and two output stackers each with a capacity of up to 4.5" of documents. Documents are fed, one at a time, under program control to the read station where each document is held stationary while it is scanned and read by an electronic flying spot optical scanner. Multiple lines of printed data can be read on documents which range in size from 3" x 6.5" to 9" x 14".

The digits 0-9, twenty-six alphabetic characters and certain special symbols printed by the devices noted in the "Table of Acceptable Characters" below in the American National Standard Character Set for Optical Character Recognition (ANSCS OCR) Font, plus the character erase symbol, can be recognized.

Format control flexibility, called the formatted mode, is provided under S/360 or S/370 or 4300 Processors program control to allow reading variable length fields in any sequence. Fields may contain machine printed, typewritten or handprinted (with #5370) characters, oriented in either of two directions on the same document. The stored program directs the beam, a field at a time, to the data to be read. Information is scanned from right to left (units to high order) and fed serially, a character at a time, to the system channel.

Unformatted mode permits multiple and continuous variable length alphameric lines, up to 6 lines/inch, right or left justified, to be read in the "normal" direction only. Preprinted reference marks are not required, however, a clear margin of at least 1" at the top and 1/2" on the other three sides must be provided.

Multi-line field mode allows the mixture of both formatted and unformatted reading on a document. See the 1288 SRL GA21-9081 for details on this capability and document design limitations when using this mode of operation on the 1288.

Unreadable handprinted and Gothic characters are automatically rescanned. Unrecognizable characters are transmitted to the processor as the standard EBCDIC substitute character code (use of @ symbol available on RPQ for possible programmed correction or reconstruction). The document remains in the read station until ejected into one of two stackers (A or R) under control of the processor program. Stacker R is normally used for selecting documents with unrecognizable characters.

Speed -- maximum document throughput depends upon document size, the number of characters and fields to be read (machine printed, typewritten, handprinted, mark read), and the processor program. For throughput for both formatted and unformatted documents, see formulae in SRL GA21-9081.

Documents and Printing -- for optimum operation, print quality must conform to quality specifications established for the 1288 described in SRL GA21-9081. Document sizes and weights must conform to those specified in SRL GA21-9081.

Additional document considerations relating to the printing device, recommended ribbons and type styles can be found in SRL GA21-9081.

TABLE OF ACCEPTABLE CHARACTERS AND PRINTING DEVICES 1288 ANSCS OCR Font Size A Only	
IBM Selectric [®] Typewriter (or equivalent)	IBM 1403 mdls 2, 3, 7, N1 IBM 3203 (all mdls) IBM 3211 (4) (or equivalent) IBM 3800 (5)
Basic 1288	
0 A N :	0 A N .
1 B 0 :	1 B 0 .
2 C P .	2 C P /
3 D 0 :	3 D 0 -
4 E R /	4 E R *
5 F S -	5 F S ‡
6 G T *	6 G T &
7 H U ‡	7 H U
8 I V ‡	8 I V
9 J W | (LVM) (1)	9 J W
Y K X - (2)	Y K X
l L Y ‡ (3)	l L Y
r M Z blank	r M Z
	blank
With #3850	
+ = { }	
z ' " ?	

- (1) Lithograph printing approved.
- (2) Group Erase permits ignoring a line or field. Symbol must be at least .300" long overstriking at least one standard height character. It must overstrike the first character on that end of the line on which scanning is initiated.
- (3) Character Erase is not available in the ANSCS OCR Size A character set. Available to ignore a character and its space for typewriters.
- (4) The OCR Print Package (#5450) is a prerequisite for OCR applications. 20-24 lb. bond is recommended for optimum performance. When other papers are used customer testing should be performed to assure adequate reading performance. Group or character erase feature should be inactive when reading 3211 generated documents.
- (5) Minimum paper weight for documents produced on the 3800 is 20 lb.

Optional Features: Expanded Symbol Set (#3850), Numeric Handwriting (#5370) including preprinted number recognition of 3/16" Gothic characters, Optical Mark Reading (#5479), and Serial Numbering (#6550) are available ... see "Special Features."

PREREQUISITES: Multiple 1288s can be attached to a system ... each 1288 contains its own control unit and requires a channel control unit position.

S/360 mdl 25 -- special feature on 2025: Multiplexer Channel or Selector Channel ... see 2025. If the 1288 is equipped with Numeric Handwriting (#5370), the 2025 must be at EC level 132845 and the 1288 at EC level 815210B.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard) or Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050. For attachment to a S/360 mdl 30, a 2030 mdl D or larger is required.

S/360 mdl 65, 65MP, 67 (in 65 mode), 75 or S/370 mdl 165, 168 -- basic multiplexer channel of 2870, Selector Subchannels on 2870.

S/370 mdl 135 -- byte multiplexer channel (standard), Selector Channels (special features), Block Multiplexer Channel (special feature) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- byte multiplexer channel (standard), Selector Channels (first one is standard), Block Multiplexer Channel (special feature) ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- byte multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), Block Multiplexer Channel (first two are standard) ... see 3155, 3158.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional).



1288 Optical Page Reader (cont'd)

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard).

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001.

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1288	1	\$5,140	\$163,440	\$1,340

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Warranty: B Purchase Option: 40% Maintenance: C
Metering: I/O Unit (Online) Per Call: 3

SPECIAL FEATURES

EXPANDED SYMBOL SET (#3850). To recognize the following eight special symbols when they are created by an IBM SelectricR typewriter, or equivalent: + = { } % ? ' .

NUMERIC HANDWRITING (#5370). [Plant installation only] For reading handprinted numeric digits 0-9 and handprinted alphabetic characters C, S, T, X, Z from documents (N is not available) ... C, S, T, Z must be in the units position of a field ... X can be anywhere. For optimum operation, character shapes and spacing must conform to the basic rules of handwriting as outlined in SRL GA21-9064. Information should be handprinted with ordinary #2 pencils or grade HB fine lead for mechanical pencils. Includes the ability to read numbers preprinted on documents by the forms supplier in Gothic 3/16" font. **Prerequisite:** For attachment to a S/360 mdl 25, this feature requires that the 1288 be at EC level 815210B and the 2025 be at EC level 132845.

OPTICAL MARK READING (#5479). For reading marks that have been either handmarked or machine printed onto documents. The feature is format compatible (except for horizontal marking) with the similar feature (#5479) on the 1287 Optical Reader, with the basic capability for reading ten- or twelve-position mark read columns. On the 1288, flexibility is increased by allowing these 1287-type mark read fields to be located anywhere in the scannable area and in either +90 or normal rotation. A further innovation provides the ability to select, by programming, any number of positions from 1 to 12 to be read from a column or group of columns. A timing mark is required for each mark read column whether 1, 2, 3, etc. up to 12 positions. Handmarked data should be recorded with ordinary #2 pencils. Marks may be parallel to the timing mark or in any orientation up to 45° in either direction from parallel to the timing mark.

SERIAL NUMBERING (#6550). For serial numbering the front side of documents after reading. A ten-position numbering head is provided ... 5 digits are manually set ... 5 are unit advanced for each document read. A control switch provides either selective serial numbering based on stacker selection or a 10-digit batch number without unit advancing. **Ribbons:** The feature uses a black ribbon (1136843) or purple ribbon (1136844), or equivalent.

Special Feature Prices:		MAC/ MRC	Purchase	MMMC	FIC
Expanded Symbol Set	#3850	\$ 73	\$ 2,240	\$ 3.50	\$282
Numeric Handwriting	5370	1,050	38,448	82.00	PO
Optical Mark Reading	5479	104	3,772	7.50	275
Serial Numbering	6550	313	9,144	66.00	449

1316 DISK PACK

Purpose: High-speed, removable, interchangeable disk storage for all models of the 1311 Disk Storage Drive and 2311 Disk Storage Drive.

The 1316 is marketed by IRD

[reverse side is blank]

**1401 PROCESSING UNIT**
[No longer available]

Models: Choice depends upon core storage capacity and I/O configuration desired ... see "Prices" below.

Model Changes: Model changes can be made within groups 1 thru 3, 11 thru 13, 4 thru 6, 14 thru 16, or 24 thru 26 having the same alphabetic prefix.

Except for G or H models, a 1401 from group 1 thru 3, 11 thru 13, can be changed to group 4 thru 6, 14 thru 16, or 24 thru 26 while adding a 1406, if the 1401 is serial no. 20000 or above.

A model G11 thru G13 may be changed to a G1 thru G3, or vice versa.

NOTE: When a model G1 thru G3 is changed to a G11 thru G13, a 1403 mdl 6 must physically replace a 1403 mdl 4 or 5 ... when a G11 thru G13 includes a 1402 mdl 5, the 1402 must be field changed to a mdl 4 when converting to a 1401 mdl G1 thru G3.

If the 1401 is serial no. 20263 or above, an F23 thru F26 can be changed to an F13 thru F16, or a model B to a C, or vice versa, or an E to a C, or an F3 thru F6 to an F13 thru F16, or vice versa.

NOTE: When changing an installed E to C, specify which of the following features are installed - Expanded Print Edit (#3835), Print Control, Add'l (#5540), Read Punch Release (#6040), Sense Switches (#7600). If not installed, they will be included in the model conversion. Also specify which model of the 1403 Printer is installed, and whether the 729 tape units to be installed are model 2 and/or 5, or model 4. A 1401 model C system requires a 1403 mdl 2. An installed 1403 mdl 1 must be converted to a mdl 2.

The following specifications can be changed in the field.

- [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V. ... must be consistent with system voltage.
- [2] Color: Color Accent - #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. Extended Color - #9031 for red, #9032 for yellow, or #9033 for blue.

PRICES:

	Mdl	MAC/ MRC	Purchase	MMMC	
Basic Card System	| 1,400 storage positions	G1	\$ 975	\$ 57,290	\$ 89.50
	| 2,000 storage positions	G2	1,080	58,130	89.50
	---| 4,000 storage positions	G3	1,205	61,450	91.50
	| 1,400 storage positions	G11	863	56,880	82.50
	| 2,000 storage positions	G12	964	57,710	82.50
	---| 4,000 storage positions	G13	1,100	61,040	83.50
Card System	| 1,400 storage positions	A1	1,225	86,100	83.00
	| 2,000 storage positions	A2	1,330	86,930	83.00
	---| 4,000 storage positions	A3	1,465	90,160	85.50
	| 8,000 system storage pos w 1406 mdl 1	A4	1,515	82,340	89.50
	| 12,000 system storage pos w 1406 mdl 2	A5	1,535	92,760	91.50
	---| 16,000 system storage pos w 1406 mdl 3	A6	1,535	92,760	91.50
Expanded Card System	| 1,400 storage positions	B1	1,380	96,290	91.50
	| 2,000 storage positions	B2	1,485	97,130	91.50
	---| 4,000 storage positions	B3	1,620	100,300	93.50
	| 8,000 system storage pos w 1406 mdl 1	B4	1,670	102,500	95.50
	| 12,000 system storage pos w 1406 mdl 2	B5	1,690	102,900	98.00
	---| 16,000 system storage pos w 1406 mdl 3	B6	1,690	102,900	98.00
729 Tape/Card System	| 1,400 storage positions	C1	2,510	129,950	138.00
	| 2,000 storage positions	C2	2,615	131,000	138.00
	---| 4,000 storage positions	C3	2,750	134,100	141.00
	| 8,000 system storage pos w 1406 mdl 1	C4	2,805	136,200	146.00
	| 12,000 system storage pos w 1406 mdl 2	C5	2,825	137,250	147.00
	---| 16,000 system storage pos w 1406 mdl 3	C6	2,825	137,250	147.00
729 Tape-oriented System	| 1,400 storage positions	D1	2,480	128,900	124.00
	| 2,000 storage positions	D2	2,585	129,950	124.00
	---| 4,000 storage positions	D3	2,720	133,050	126.00
	| 8,000 system storage pos w 1406 mdl 1	D4	2,770	135,150	129.00
	| 12,000 system storage pos w 1406 mdl 2	D5	2,805	136,200	130.00
	---| 16,000 system storage pos w 1406 mdl 3	D6	2,805	136,200	130.00
7330 tape-oriented System	| 1,400 storage positions	D11	1,995	128,900	119.00
	| 2,000 storage positions	D12	2,095	129,950	119.00
	---| 4,000 storage positions	D13	2,230	133,050	124.00
	| 8,000 system storage pos w 1406 mdl 1	D14	2,285	135,150	126.00
	| 12,000 system storage pos w 1406 mdl 2	D15	2,305	136,200	128.00
	---| 16,000 system storage pos w 1406 mdl 3	D16	2,305	136,200	128.00
7330 Tape/Card System	| 1,400 storage positions	E1	1,900	125,800	122.00
	| 2,000 storage positions	E2	1,995	125,800	122.00
	---| 4,000 storage positions	E3	2,140	129,950	124.00
	| 8,000 system storage pos w 1406 mdl 1	E4	2,180	132,150	127.00
	| 12,000 system storage pos w 1406 mdl 2	E5	2,210	132,550	129.00
	---| 16,000 system storage pos w 1406 mdl 3	E6	2,210	132,550	129.00
1405/Card System	| 4,000 storage positions	F3	1,650	101,650	95.50
	---| 8,000 system storage pos w 1406 mdl 1	F4	1,700	103,950	99.50
	| 12,000 system storage pos w 1406 mdl 2	F5	1,720	104,350	102.00
	---| 16,000 system storage pos w 1406 mdl 3	F6	1,720	104,350	102.00
1405/729 Tape/Card System	| 4,000 storage positions	F13	2,660	131,000	130.00
	---| 8,000 system storage pos w 1406 mdl 1	F14	2,710	133,600	136.00
	| 12,000 system storage pos w 1406 mdl 2	F15	2,730	134,000	137.00
	---| 16,000 system storage pos w 1406 mdl 3	F16	2,730	134,000	137.00
1405/7730 Tape/Card System	| 4,000 storage positions	F23	2,160	131,000	127.00
	---| 8,000 system storage pos w 1406 mdl 1	F24	2,210	133,600	129.00
	| 12,000 system storage pos w 1406 mdl 2	F25	2,240	134,000	133.00
	---| 16,000 system storage pos w 1406 mdl 3	F26	2,240	134,000	133.00

Plan Offering: Plan A, Additional Use Charge Rate: 30% Purchase Option: 45%
Maintenance: B Per Call: 3 Metering: Base Unit (meters 1406) Warranty: B



1401 Processing Unit (cont'd)

SPECIAL FEATURES

The following special features are on an "as available" basis for field installation.

• For General Use

ADVANCED PROGRAMMING (#1060). [B, C, D, E, F mdls only] Includes the following instructions: Indexing -- three index locations are provided to modify addresses automatically ... Store A-Address Register - Q(AAA) -- stores contents of "A" address register in (AAA) prior to reading this instruction ... Store B-Address Register - H(AAA) -- stores contents of "B" address register in (AAA) prior to reading this instruction ... Move Record -- a special "Move" instruction for moving a complete record from one storage area to another without regard to word marks within the record. For details see SRL Reference Manual.

BIT TEST (#1470). [B, C, D, E, F, G mdls only] To test any position in storage for any bit. **Limitation:** Since the function provided by this feature is part of Column Binary (#1990), it is not required and cannot be installed if #1990 is installed. **Note:** This feature is required to attach a 7641 Hypertape Control if #1990 is not installed.

HIGH-LOW-EQUAL COMPARE (#4575). [B, C, D, E, F, G mdls only] Indicators can be tested for a high, low or equal condition after a "Compare" instruction has been executed ... applies to alphabetic as well as numeric data.

MULTIPLY-DIVIDE (#5275). [B, C, E, F mdls only] Provides the following: **Multiply** -- an area of core storage must be set aside equal in length to the combined lengths of the multiplier and multiplicand, plus one. This area, or "B" field, is used to hold the multiplier in the high-order positions and develop the product in the low-order positions. The multiplicand is placed in the "A" field. After the multiplier has been moved to the high-order positions of the "B" field, the multiply operation is executed. Upon completion of the operation, the product is available beginning with the units position of the "B" field. Speed depends upon the size of the multiplier and multiplicand; e.g., a 6-position field multiplied by a 4-position field requires only 1.96 milliseconds. **Divide** -- a field in which the quotient will be developed is set aside immediately to the left of the dividend field. The divisor can be any other place in core storage. After the "Divide" instruction is executed, the quotient is available beginning with the units position of the field set aside for it; the remainder beginning with the units position of the dividend field. Speed depends upon the size of the expected quotient.

PROCESSING OVERLAP (#5730). [B, C, D, E, F mdls only] Allows the system to compute while input/output is in process. Computing continues while the I/O unit prepares to send or receive data, and between character transfers. When the transfer begins, computing is interrupted to receive a character when signalled by the I/O unit. **Limitation:** Can be field installed only on 1401s serial no. 26410 or above.

Notes: [1] For most efficient system operation involving card operations, installation of Early Card Read (#3550) on the 1402 in conjunction with this feature is recommended ... [2] This feature is recommended for optimum operation of a 1419 Magnetic Character Reader ... [3] This feature is not effective with a 1009 Data Transmission Unit, a 1012 Tape Punch, 1412 Magnetic Character Reader, 1418 Optical Character Reader, or 1428 Alphameric Optical Reader.

SENSE SWITCHES (#7600). [A, B, E, F, G, H mdls only ... standard on C, D mdls] A group of six sense switches which provide manual control of a stored program and give six additional conditions the "Branch" instruction can test ... the "d" modifier of the instruction specifies which switch is to be tested. **Maximum:** One group.

• For Card and Tape Systems

COLUMN BINARY (#1990). [B, C, E, F mdls only] To convert binary cards to magnetic tape, and vice versa ... cards with multiple significant digit punching in a single column can also be processed. This feature is required to attach a 7641 Hypertape Control, if Bit Test (#1470) is not installed. **Limitations:** When reading such characters, the validity check is inhibited because all characters are considered valid ... since this feature includes the function provided by Bit Test (#1470), it is not required and cannot be installed if #1470 is installed.

• For 1402 Card Read Punch

PUNCH FEED READ CONTROL (#5895). [A, B, C, E, F, G, H mdls only] Required for Punch Feed Read (#5890) on a 1402 mdl 1, 4, 5 or 6. **Limitation:** For field installation 1401 must be serial no. 20000 or above.

READ PUNCH RELEASE (#6040). [A, B, E, F, G, H mdls only ...

standard on C mdls] The Read Release and Punch Release instructions are installed as one feature and operate as follows: Read Release -- operation code "8" causes the card reader to start the next cycle and allows processing to continue. A "Read" instruction must then be given prior to the time the reader is ready to read the "9" row of the card ... allows a gain of 21 milliseconds for processing time between successive card feed cycles. Punch Release -- operation code "9" causes the card punch to start the next cycle and allows processing to continue. A "Punch" instruction must be given prior to the time the 1401 must read data to the punch for punching the "12" row of the card ... allows a gain of 37 milliseconds of processing time between successive punch cycles.

• For Printers

EXPANDED PRINT EDIT (#3835). [A, B, E, F, G, H mdls only ... standard on C and D mdls] Expands print edit as follows: Asterisk Protection -- printing of high-order zeros replaced with asterisks until a significant digit is sensed. Floating Dollar -- printing of all high-order zeros is suppressed and a dollar sign prints immediately to the left of the first high-order significant digit. Decimal Control -- when a decimal point is sensed, suppression of zeros is stopped unless a significant digit is not sensed in any of the positions to the right of the decimal point, in which case all zeros and the decimal point are suppressed. Sign Control Left -- a "CR" or "-" character is printed in the high-order position of the control word if the edited word is negative.

NUMERICAL PRINT CONTROL (#5380). [B, C, D, E, F mdls only] Required for Numerical Print Feature (#5381) on a 1403 mdl 1 or 2. **Limitation:** Can be field installed only on 1401s serial no. 20000 or above.

PRINT CONTROL (#5539). [B, E, F mdls only ... standard on C mdls] Required to control the 32 additional print positions of a 1404 Printer.

PRINT CONTROL, ADD'L (#5540). [A, B, E, F, G1, G2, G3 mdls only ... standard on C and D mdls] Required to control the 32 additional print positions of a 1403 Printer mdl 2 or 5.

PRINTER (1404) ADAPTER (#5563). [B, C, E, F mdls only] To attach a 1404 Printer. **Limitation:** Can be field installed on 1401s serial no. 26410 or above only.

PRINT STORAGE (#5585). [B, C, D, E, F mdls only] Provides additional storage to print a line from the main storage print area with the "Print" instruction. Upon completion of the transfer, normal program execution is resumed while the printer prints a line from print storage, increasing available process time by the 84 milliseconds normally interlocked by a print operation. Reduces job time on combination I/O operations involving printing. Two additional instructions, "Branch on Carriage Busy" and "Branch on Printer Busy", are provided to interrogate the status of carriage and printer and to allow maximum utilization of the additional processing time.

READ-COMPARE ADAPTER (#5991). [B, C, E, F mdls only] Required for Read-Compare (#5990) on a 1404. **Limitation:** Can be field installed only on 1401s serial no. 26410 or above.

SELECTIVE TAPE LISTING CONTROL (#6412). [B, C, E, F mdls only] Required for Selective Tape Listing Feature (#6411) on a 1403 mdl 1 or 2. **Limitations:** Can be installed only on 1401s serial no. 20000 or above ... cannot be installed on a 1401 ordered for future installation of a 1404 Printer.

SPACE SUPPRESSION (#7246). [For any mdl] Provides 1403 or 1404 space suppression under program control.

• For Tape Systems

COMPRESSED TAPE (#2210). [C, D, E, F (except F3-F6) mdls only] Two additional instructions permit the 1401 to read a tape record written with zero elimination by a 7070/7074 system and to expand it within core storage for processing. **Prerequisite:** Advanced Programming (#1060).

800 CPI FEATURE (#3580). [C1-C6, D1-D6, F13-F16 mdls only] To operate 729 V Magnetic Tape Units at 800 cpi density ... see Tape Densities Option Switch under 729 II/IV/V/VI.

TAPE INTERMIX (#7804, 7805). [C1-C6, D1-D6, F13-F16 mdls only] #7804 -- to mix 729 IVs with 729 IIs or Vs ... #7805 -- to mix 729 II or Vs with 729 IVs. **Limitation:** Can be installed only on 1401s serial no. 20263 or above.

Prerequisite:

To operate 729 Vs at 800 cpi in any of these combinations, an 800 CPI Feature (#3580) is also required.

• For 1311 Disk Storage Drives

DISK STORAGE DRIVE ADAPTER (#3339). [B, C, E mdls only]



1401 Processing Unit (cont'd)

Required for the attached 1311 mdl 4 ... also permits attachment of up to four additional 1311 mdl 2s.

• For Serial I/O Units

SERIAL I/O ADAPTER (#7080). [B, C, D, E, F, G mdls only] To attach a 1012 Tape Punch, or a 1401, 1231 Optical Mark Page Reader, 1419 Magnetic Character Reader, or Direct Data Channel (#3271) to the system. One adapter can be used for all these attachments, but only one attachment can be made at a time. **Limitation:** Only a 1012 or a 1231 can be attached to 1401 G mdls. **Prerequisites:** Diagnostic programs require the following minimum storage positions: For 1012 -- 2,000 ... for 1231 -- 4,000.

• For Direct Inter-system Data Transfer

DIRECT DATA CHANNEL (#3271). [B, C, D, E, F mdls only] Permits two 1401s, or a 1401 and a 1441 (1440 or 1460) to transfer data between systems. Data is transferred via a cable connected to a Serial I/O Adapter (#7080) on each system. The cable can be manually attached or detached. When attached, no other attachment can be made to #7080. Only one #3271 is required to connect the two systems ... it may be ordered for either system, but Emergency Power-Off (#9144) must be ordered for the other system. **Specify:** Length of cable, to a maximum of 100 feet ... also indicate system to which the 1401 will be attached and whether it is installed or on order. **Prerequisites:** Advanced Programming (#1060) and Serial I/O Adapter (#7080).

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
• For General Use				
Advanced Programming #1060	\$108	\$ 4,040	\$ 1.50	\$592
Bit Test	1470	20	848	1.00
High-Low-Equal Compare	4575	76	2,865	2.50
Multiply-Divide	5275	333	11,950	14.00
Processing Overlap	5730	255	15,380	25.00
Sense Switches	7600	15	582	1.00
• For Card and Tape Systems				
Column Binary	1990	101	3,685	3.50
For 1402 Card Read Punch				
Punch Feed Read Control	5895	56	2,095	2.50
Read-Punch Release	6040	25	1,005	1.00
• For Printers				
Expanded Print Edit	3835	20	795	1.00
Numerical Print Control	5380	50	2,045	1.50
Print Control	5539	61	2,510	1.50
Print Control, Add'l	5540	61	2,510	1.50
Printer (1404) Adapter	5563	25	1,410	2.00
Print Storage	5585	386	12,890	40.50
Read-Compare Adapter	5991	76	4,365	2.00
Selective Tape List Cntrl	6412	86	4,415	NC
Space Suppression	7246	78SUC	63	NC
• For Tape Systems				
Compressed Tape	2210	35	1,330	4.50
800 CPI Feature	3580	35	1,620	NC
Tape Intermix				
to add 729-IVs to II/Vs	7804	NC	NC	NC
to add 729 II/Vs to IVs	7805	NC	NC	NC
• For 1311 Disk Storage Drives				
Disk Storage Drive Adptr	3339	101	4,925	6.50
• For Serial I/O Units				
Serial I/O Adapter	7080	101	3,845	2.00
• For Direct Inter-system Data Transfer				
Direct Data Channel	3271	NC	NC	NC

† Field installation charge

1402 CARD READ PUNCH
[No longer available]

Model 4 For a 1401 mdl G1, G2, G3, G11, G12 or G13

Model 5 For a 1401 mdl G11, G12 or G13

Model Changes: Model 5 can be changed in the field to model 4, or vice versa.

The following specifications can be changed in the field:

[1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: Color Accent -- #9043 for blue, or, if other system units are to have red, yellow or gray accents, #9044 for charcoal. Extended Color -- #9031 for red, #9032 for yellow, or #9033 for blue.

[3] Numerical Print Feature: #5381. For 1401 system only. Required if Numerical Print Feature (#5381) is installed on a 1403 Printer.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
1402	4	\$ 504	\$30,520	\$187
	5	478	29,420	182

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Warranty: B Purchase Option: 45% Maintenance: C
Metering: I/O Unit (Online) Per Call: 3

SPECIAL FEATURES

The following features, as appropriate, are on an "as available" basis for field installation.

EARLY CARD READ (#3550). [Mdl 1 only ... standard on mdls 4, 5 and 6 ... not available on mdl 2] To allow the 1402 to maintain high reading speed during lengthy processing routines. In such routines, the card reading mechanism can engage sooner, reducing time between reading of cards ... see appropriate Reference Manual for details.

PUNCH FEED READ (#5890). [Mdls 1, 4, 5 and 6 only ... not available on mdl 2] For punching output data into the same card from which input data was read. Adds a special set of 80 reading brushes one station ahead of the punch station. **Limitation:** Refer to SRL GA24-3074 for limitations on use of prepunched cards. **Prerequisite:** Punch Feed Read Control (#5895) on 1401.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Early Card Read	#3550	\$ 10	\$ 241	NC
Punch Feed Read	5890	31	1,045	\$5.50



1403 PRINTER

Purpose: Printed output unit for the data processing systems indicated below.

For use with System/3, S/360 mdl 20 and 1130, see GSD manual.

Model	Print Pos.	Speed (max)	For Use With
1†	100	600 lpm	1401 mdls A, B, E, F, 1410, 7010, 7040, 7044
2	132	600 lpm	1401 mdls A, B, C, D, E, F, 1410, 1440, 1460, 7010, 7040, 7044, S/360 mdls 22, 30, 40, 50, 65, 67, 75, 85, 195, all S/370 Processors, all 4300 Processors.
3†	132	1,100 lpm	1410, 1440, 1460, 7010, 7040, 7040 7044, S/360 mdls 30, 40, 44, 50, 65, 67, 75, S/370 mdls 135 thru 165.
4†	100	465 lpm	1401 mdls G1, G2, G3.
5†	132	465 lpm	1401 mdl G1, G2, G3, 1440.
6	120	340 lpm	1401 mdls G11, G12, G13, H3, 1440.
7	120	600 lpm	S/360 mdls 22, 30, 40, 44, 50, 65, 67, 75, 85, 195, all S/370 Processors, all 4300 Processors.
N1	132	1,100 lpm	S/360 mdls 22, 30, 40, 44, 50, 65, 67, 75, 85, 195, all S/370 Processors, all 4300 Processors.

Model Changes: Can be made in the field between models 1 and 2, models 2 and 7, models 4 and 5, or models 5 and 2.

PREREQUISITES: 1403 mdl 3 or N1 only -- a 1416 Interchangeable Train Cartridge is required on each 1403 mdl 3 or N1 ... see 1416.

1401 (except G and H mdls) -- one 1403 mdl 2 (by field change from a mdl 1) can be attached. The 1403 mdl 2 requires Print Control, Add'l (#5540) on the 1401.

1401 Model H3 -- one 1403 mdl 6 can be attached.

1401 G Models -- one 1403 mdl 4 or 5 can be attached to a 1401 mdl G1, G2, G3. Print Control, Add'l (#5540) is required on the 1401 for a 1403 mdl 5. One 1403 mdl 6 can be attached to a 1401 mdl G11, G12, G13.

1440 -- one 1403 mdl 2, 3, 5 (by field change from a mdl 4) or a mdl 6 can be attached to a system via a 1446 Printer Control equipped with the appropriate Attachment feature (#1325, 1326, 1327, 1328) ... see 1446.

1460 -- 1403 mdl 2s and 3s can be attached only if the prerequisite 1461 I/O Control and 1462 Printer Control and any of their required features are already installed.

7040/7044 -- up to three 1403s [mdls 1, 2 and 3 in any combination] can be attached only if the prerequisite 1414 I/O Synchronizer mdl 3, 4 or 8 and its prerequisites are already installed.

S/360 mdl 25 -- one 1403 mdl 2 or 7 can be attached via an Integrated 1403 Attachment (#4590) on the 2025, or one mdl N1 can be attached via #4590 and an 1100 LPM Printer Adapter (#3615) on the 2025 ... see 2025. For these attachments, an appropriate adapter is also required on the 1403 itself ... see item [3] under "Specify." 1403 mdl 2s, 7s or N1s can also be attached to a system via a 2821 Control Unit mdl 1, 2, 3 or 5 attached to the S/360 mdl 25 multiplexer or selector channel ... see 2821 for 1403 attachment details.

S/360 mdl 30, 40, 44, 50, 65, 67, 75, or S/370 mdl 115, 125, 135, 135-3, 138, 145, 145-3, 148, 155, 165 -- 1403 mdls 2, 7 and N1 are attached via a 2821 Control Unit mdl 1, 2, 3 or 5 ... see 2821 for attachment details. **Notes:** [1] 1403 mdl 3 is not available on a S/370 mdl 115, 125 ... [2] For a 1403 mdl 2 or 3, an appropriate adapter is required on the 1403 itself. See "Specify". For a S/370 mdl 125, 135, 135-3 or 138 also see the following paragraph.

S/370 mdl 125, 135, 135-3, 138 -- a 1403 mdl 2, 7 or N1 can be attached via an appropriate Integrated Adapter ... see "Special Features" under 3125, 3135, 3135-3 or 3138. **Note:** For a 1403 mdl 2, an appropriate adapter is required on the 1403 itself ... see "Specify." On a 1403 mdl 2, 7 or N1, an appropriate voltage conversion adapter is required on the 1403 itself ... see "Specify."

S/360 mdl 22, 85, 195, S/370 mdl 158, 168, 195, 3031, 3032, 3033 and 4300 Processors -- 1403 mdls 2, 7 and N1 are attached via a 2821 Control Unit mdl 1, 2, 3 or 5. See 2821 for

† No longer available.

attachment details. **Note:** For a 1403 mdl 2, an appropriate adapter is required on the 1403 itself ... see item [2] under "Specify."

Highlights: Actual speeds depend upon the operation. The system's processing unit performs all format and analysis control. A line of printing is presented to the printer in the arrangement in which it is to be printed. All data printed is checked against data received from core storage.

Each print position can print any one of 48 characters ... alphabetic, numeric, and 12 special characters. Characters are spaced 10/inch. Line spacing is 6 or 8 lines/inch, under operator control. Continuous marginally punched forms from 3-1/2" to 18-3/4" in overall width are fed by an automatic carriage. Minimum form depth is 1" ... maximum is 22" at 6 lines/inch, or 16-1/2" at 8 lines/inch. Forms spacing and skipping governed by the stored program. A standard pre-punched 12-channel tape is supplied with each 1403 for use in verification of forms movement. Standard skipping is approximately 33"/second. The standard carriage on printers used with all systems is dual-speed, except for a 1403 mdl 1 or 2 used in a 1401 mdl A system, or a 1403 mdl 6 or 7 regardless of system. The dual speed carriage permits skipping at approximately 75"/second on skips over 8 lines long. **Note:** On a mdl N1, under certain unique conditions, the 75"/second skip is turned off and skipping continues at approximately 33"/second ... see SRL GA24-3073 for details.

The printer and carriage open for easy loading and alignment of forms. On all mdls except mdl N1, forms are wheeled to and from the printer on a double-duty, two-section forms stand which reduces paper handling and set-up time. The mdl N1 has sound absorbent covers extending to the floor for reduced noise level. A motorized cover facilitates operator handling. The acoustical cover design incorporates platforms for feeding and stacking of forms. A forms cart is available for the mdl N1 ... see "Accessories" below.

Program Compatibility -- the 1403 mdl 3 is program compatible with the mdl 2 or 5. Existing programs for mdl 2s and 5s need not be changed for a mdl 3, except in those cases where, because of the reduced time required to print a line, the overall I/O scheduling must be re-optimized.

Note: Program compatibility between 1400 series systems and S/360 mdls 25, 30, 40, 50 or S/370 mdls 125, 135, 135-3, 138, 145, 145-3, 148, 155 requires compatibility features on the appropriate S/360, S/370 Processor or a 4331 Processor.

The 1403 mdl N1 is program compatible with the mdl 2 or 3 used in S/360 mdls 25, 30, 40, 44, 50, 65, 67, 75 and with the mdl 2 used in S/360 mdls 22, 85, 195, any S/370 Processor or any 4300 Processor. Existing programs for the mdl 2s and 3s need not be changed for a mdl N1, except in those cases where, because of the reduced time required to print a line, the overall I/O scheduling must be re-optimized.

The 1403 mdl 2 is program compatible with 5203 Printer mdls, including the tapeless carriage facility. Existing programs for the 5203 need not be changed, except in those programs where the overall I/O scheduling must be re-optimized to utilize the reduced print time/line, or if the user wishes to use more print positions on a 1403 than were on the 5203 being replaced.

Printed Output for Optical Character Reading -- 1403 print chains and 1416 trains can be equipped for printing on documents to be read by the following optical character readers:

1230 Optical Mark Scoring Reader	1418 Optical Character Reader
1231/1232 Optical Mark Page Reader	1428 Alphameric Optical Reader
1282 Optical Reader Card Punch	3881 Optical Mark Reader
1287 Optical Reader	3886 Optical Character Reader
1288 Optical Page Reader	

Depending upon system with which the 1403 will be used, and the optical character reader involved, see appropriate section of the "Type Catalog" for feature #(s) to be specified for the required 1403 print arrangement. The ribbons used on the 1403 must be capable of producing printed characters suitable for recognition by the optical reader used. For recommended ribbons and document specifications, see appropriate optical reader description.

Limitations: [1] The dual-speed carriage is not available on a 1403 mdl 6 or 7, or on printers used with 1401 mdl As.

[2] 1403 mdls 3 and N1: Forms sets used on 1403 mdls 1, 2, 4, 5, 6 or 7 (chain printers) may not produce acceptable results when used on 1403 mdl 3 or N1 (train printers). A six-part set which gives satisfactory results on a chain printer may show a decrease in the print quality of the last copies when used on an 1100 lpm train printer ... for details, see SRL GA24-3041.

[3] Multiple-part forms are not recommended for OCR printing. The print quality of the top sheet is affected by the underlying sheets. Under no circumstances should the copy sheets be used for optical scanning. For best results, use single-part forms for OCR printing.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001,



1403 PRINTER (cont'd)

1401/1460 -- GA24-1495, 1410/7010 -- GA22-6826, 1440 -- GA24-3005, 7040/7044 -- GA28-6288.

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): **#9903** for 208V, or **#9905** for 230 V ... must be consistent with system voltage.

[2] Voltage Adapter: **#9709**. Required when a 1403 mdl 2 or 3 is to be attached to any S/360, S/370 Processor or 4300 Processor. **Limitation:** 1403 mdl 3 is not available for attachment to a S/360 mdl 22, 25, 85, 195, or any 4300 Processor. **Note:** When an installed mdl 2, 3 or 5 (from other than S/360, S/370 or 4300 Processors) is retained for attachment to these systems, new cables must be ordered. Refer to Physical Planning Manual for cable requirements and ordering procedure.

When #9709 is field installed, the standard configuration chain/train previously installed will be modified to an AN or HN arrangement of the same type size or style. See "Type Catalog" (S/360, S/370 and 4300 Processors) - 1403 and 1404 Printers for feature # to which chain (or train) is to be modified. Submit (on 1403 mdl 2, or 1416 for 1403 mdl 3) specifying "Change installed chain (train) # ___ to # ___."

If Interchangeable Chain Cartridge Adapter (#4740) is installed on mdl 2, both alphameric chains (standard configuration only) will be modified, one to AN and one to HN. Modification is restricted to same type size or style as previously installed.

[3] Attachment to 2025 via Integrated 1403 Attachment (#4590): The following adapters are required on the 1403; On 1403 mdl 2 or 7, a 600 LPM Voltage Conversion Adapter (#9725) ... on 1403. mdl N1, an 1100 LPM Voltage Conversion Adapter (#9726). These can be field installed. **Note:** On a 1403 mdl 2, a Voltage Adapter (#9709) is also required ... see [2] above.

[4] Attachment to a S/370 mdl 125 via an Integrated Printer Adapter (#4662, 4667, 4668) or a S/370 mdl 135, 135-3, 138 via an Integrated Printer Adapter Basic Control (#4670) with either the Integrated 1403 Printer Mdl 2, Mdl 1 Attachment (#4672) or the Integrated 1403 Printer Mdl 7 Attachment (#4677). The following adapters are required on the 1403; on 1403 mdl 2 or 7, a 600 LPM Voltage Conversion Adapter (#9725) ... on 1403 mdl N1, an 1100 LPM Voltage Conversion Adapter (#9726). These can be field installed. **Note:** On a 1403 mdl 2, a Voltage Adapter (#9709) is also required ... see item [2] above.

[5] Print Chain/Train Arrangement:
With S/360, S/370 or 4300 Processors (1403 mdl 2, 3 or N1) -- see "S/360, S/370 and 4300 Processors -- 1403 and 1404 Printers" in "Type Catalog". For mdls 3 and N1, also see item [6] below. Universal Character Set Feature (#8640, 8641) is required on a mdl 2, 3 or N1, or Multiple Character Set Feature (#5110, 5111) on a mdl 2 or N1 for any arrangement other than the 48-character set composed of identical arrays of standard sequence ... see "Special Features" below and "Type Catalog" page TC-71, etc.
With 1401, 1410, 1440, 1460, 7010, 7040, 7044 (1403 mdls 1, 2, 4, 5 or 6) -- one feature #, unless Interchangeable Chain Cartridge (#4740) is ordered. See "Special Features" below and "Other than S/360 - 1403 and 1404 Printers" in "Type Catalog". For mdl 3, also see item [6] below.

[6] 1416 Interchangeable Train Cartridge (mdl 3 or N1 only): At least one 1416 is required with each 1403 mdl 3 or N1 ... see 1416.

[7] Color: For mdls 1, 2, 3, 4, 5, 6, 7 -- Color Accent -- **#9043** for blue, or, if other system units are to have red, yellow or gray accents, **#9044** for charcoal. Extended Color -- **#9031** for red, **#9032** for yellow, or **#9033** for blue. For mdl N1 -- **#9041** for red, **#9042** for yellow, **#9043** for blue, **#9045** for gray, or **#9046** for white. For mdls 2, 5, 6, 7 -- **#9046** for white.

[8] Tape Punch: Order Part No. 120910 if the 1403 is for a New Name Account. One punch is furnished at no charge per installation.

[9] For mdl 3 or N1, cross reference Branch/Plant Order No. of 1416(s) which will be used with the 1403.

[10] Kickstrips: [on 1403 mdl N1 only] **#9350**, if desired. Also available When kickstrips are installed, the open area underneath the machine is enclosed. They reduce the amount of "toe-room" and may be inconvenient to the user if the power outlet is located beneath the machine.

PRICES:	Mdl	- FTP / -			Purchase	MMMM
		MAC/ MRC	MLC 1 yr**	MLC 2 yr		
1403	1†	\$869	\$799	\$730	\$21,300	\$256
	2	925	851	777	22,000	295
	3†	1,081	995	908	38,140	341
	4†	660	607	554	20,370	199
	5†	715	658	601	21,070	213
	6	480	442	403	18,760	195
	7	777	715	653	21,140	229
	N1	1,081	995	908	38,140	341

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Metering: I/O Unit (Online) Warranty: B Maintenance: C
Purchase Option: 45% Upper Limit Percent: 0% Per Call: 3
Model/Feature Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%

SPECIAL FEATURES

* Any of the following field installable special features, as appropriate, are on an "as available" basis for field installation on discontinued 1403 models.

AUXILIARY RIBBON FEEDING FEATURE (#1376). [mdls 1, 2, 4, 5, 6, 7 ... standard on mdls 3 and N1] Recommended for satisfactory utilization of polyester film ribbons ... can also be used for conventional fabric ribbons. The polyester film (424325), or its equivalent, provides improved print quality for both optical character recognition and other quality printing applications. See IRD sales manual. **Note:** For specific details for optical character recognition covering printing unit, document types, recommended ribbons and type style, see 1282.

INTERCHANGEABLE CHAIN CARTRIDGE ADAPTER (#4740). [mdls 1, 2, 4, 5, 6, 7 only] Permits operator to insert an interchangeable chain cartridge with different type font, style or special character arrangement. The change can be made quickly without special tools. Operation of the printer remains unchanged. Two interchangeable cartridges with chains are supplied, one in lieu of the standard fixed cartridge and one additional. See "Type Catalog" for feature #s of available arrangements.

For Plant Installation -- Specify: For other than S/360, S/370 or 4300 Processors, #4740 and any two alphameric print chain arrangements, except if Numerical Print Feature (#5381) is also ordered. If #5381 is ordered, specify #4740, one numeric chain (#9485 for .095" type size, or #9484 for .079") and one alphameric print chain arrangement. See appropriate section of "Type Catalog." For mdl 2 to be used with a S/360 mdl 22 thru 85, S/370 or 4300 Processors, or mdl 7 for use with a S/360 (except mdl 67), S/370 or 4300 Processors, specify #4740 and any two alphameric print chain arrangements. See "Type Catalog -- S/360, S/370 and 4300 Processors - 1403 and 1404 Printers" for available arrangements.

For Field Installation -- the installed fixed cartridge is modified for interchangeability and an additional interchangeable cartridge with chain is supplied. Specify #4740 and any one alphameric print chain arrangement. [Note: When an installed 1403 mdl 2 is to be modified for use with S/360, S/370 or 4300 Processors, both alphameric chains will be modified at no charge ... see item [2] under "Specify."

MULTIPLE CHARACTER SET FEATURE (#5110, 5111). [For use on a 1403 mdl 2 or N1 natively attached to a S/360 mdl 25 only] #5110 -- for mdl 2 ... #5111 -- for mdl N1. Required for use of any print arrangement other than a 48-character set composed of identical arrays of standard character sequence ... see "Type Catalog", TC-71, etc. Permits use of all standard print arrangements. Arrangements with identical repeatable sets will achieve the same printing speed as with the Universal Character Set Feature on these models. Preferred arrangements in non-repeatable sets will result in speed degradation from those speeds specified for the UCS feature. **Note:** This feature provides the same function as the Universal Character Set Feature on the 1403 mdl 2 (#8641) or N1 (#8640). If 1403 is already equipped with UCS (#8640/8641), do not order #5110 or #5111. **Prerequisites:** For either model -- Integrated 1403 Attachment (#4590) and Multiple Character Set Adapter (#5100) on the 2025, plus Utility Load Program 360-P-UT-048. In addition, the following are required: For mdl 2 -- 600 LPM Voltage Conversion Adapter (#9725) and Interchangeable Chain Cartridge Adapter (#4740) on the 1403 itself ... see #4740 above and item [3] under "Specify." For mdl N1 -- 1100 LPM Printer Adapter (#3615) on the 2025, and 1100 LPM Voltage Conversion Adapter (#9726) on the 1403 mdl N1 itself ... see item [3] under "Specify."

NUMERICAL PRINT FEATURE (#5381). [mdl 2 only] [Plant installation only] For numerical output at a rate of 1,285 lpm ... actual speed depends upon the operation. When operating in numeric mode, standard carriage operation and checking remain

** FTP is 12-23 months.

† No longer available

**1403 PRINTER** (cont'd)

unchanged, except that an alphabetic character causes a print check error. The numeric chain (#9485 for .095" type size, or #9484 for .079") has ten numeric characters and the special characters \$ □ . * , and - arranged in fifteen identical type arrays. **Limitation:** Not available for printers used with 1401 A mdls, S/360, S/370 or 4300 Processors. **Specify:** #5381, one numeric chain (#9485 or #9484) and Interchangeable Chain Cartridge Adapter (#4740) with one alphameric print chain arrangement ... see "Type Catalog" for feature #s. **Prerequisites:** Interchangeable Chain Cartridge Adapter (#4740) on the 1403 ... Numerical Print Control (#5380) on the 1401 Processing Unit, 1414 I/O Synchronizer mdl 3, 4 or 8, 1446 Printer Control, 1461 I/O Control, or 1462 Printer Control Unit ... in a 1401 system, Numerical Print Feature (#5381) on the 1402 Card Read Punch (no charge).

PREFERRED CHARACTER SET FEATURE (#5523). [Mdl 3 only] [1440 or 1460 only] Provides for printed output up to 1,400 lpm. When only numeric printing is required, 1,400 lpm is possible. With alphameric printing, when the content is predominantly numeric, speeds in excess of 1,100 lpm can be obtained. The PCS feature has 48 characters on the chain, so arranged that the most common characters can be presented to the print hammers more frequently. For example, the alphameric train of Preferred Character Set A (#9561) consists of:

Characters of primary preference, appearing 8 times	0-9 . . *
Characters of secondary preference, appearing 4 times	A-Z □ \$ / &
Characters of least preference, appearing 2 times	% # @ †

If output consists only of characters of primary preference, illustrated above, at least 1,385 lpm can be printed ... for characters of secondary preference only, at least 920 lpm ... for those of least preference, at least 550 lpm. Actual speed depends upon the frequency of printing of characters most common on the train.

Prerequisites: A 1416 Interchangeable Train Cartridge equipped with Preferred Character Set print train. See 1416 and "Type Catalog - Other than S/360 - 1403 and 1404 Printers" for PCS print train arrangements ... Preferred Character Set Adapter (#5524) on the 1446 Printer Control, 1461 I/O Control or 1462 Printer Control Unit to which the 1403 is attached. **Note:** A rental 1416 must be replaced by a capacity increase 1416 when #5523 is to be field installed on the 1403, unless customer desires to order an additional 1416. See 1416 and "Type Catalog" for items to be specified on 1416 order.

If both a standard train and a Preferred Character Set are desired; two 1416s are required, one with a Preferred Character Set print train. If only Preferred Character Set train is desired, only one 1416 is required. Each print train requires its own 1416.

SELECTIVE TAPE LISTING FEATURE (#6410, 6411). [1401, except A or D mdls, 1440, 1460 or S/360 only] #6410 -- for mdl 3 or N1 ... #6411 -- for mdl 1 or 2. Permits operation of eight 1.5" or four 3.1" tapes ... may be fanfold or roll (fanfold only on mdl N1) ... up to 13 characters per 1.5" tape; up to 29 per 3.1" tape. Combinations of 3.1" and 1.5" tapes are possible. However, each 3.1" tape requires one of the following pairs of 1.5" tape positions; 1 and 2, 3 and 4, 5 and 6, or 7 and 8. Each tape is individually spaced under program control. No forms skipping is provided when the feature is in use. Easily interchangeable by operator between tape listing and standard 1403 forms printing. On mdls 1, 2 and 3, a feature mode switch is provided. This switch temporarily disconnects the standard carriage control circuits and activates the tape-feeding circuits when the tape-spool assembly tray is latched in the operating position. On mdl N1, this switching is accomplished when the center guide plate is installed. Can be used with either an alphameric chain or Numerical Print Feature (#5381) on mdls 1 and 2, with Universal Character Set Feature (#8641) on a mdl 2, with an alphameric train or Preferred Character Set Feature (#5523) on a mdl 3, or with an alphameric train or Universal Character Set Feature (#8640) on a mdl 3 or N1. A stacker is available for stacking tapes. See "Accessories" below. **Limitations:** A 1403 mdl 2, 3 or N1 is required to utilize the full capacity of this feature ... see SRL GA24-3073 for details. #6411 cannot be installed on a 1403 mdl 2 attached to a S/360 mdl 25 via the Integrated 1403 Attachment (#4590).

Prerequisites: Selective Tape Listing Control (#6412) on 1401, 1446, 1461 or 1462. 1401 must be serial no. 20000 or above. **Note:** This feature should not be ordered for a 1401 if future installation of a 1404 Printer is planned.

Warning: Orders are no longer being accepted for #6410 on 1403 mdl N1s to be used in any S/360 ... for Selective Tape Listing on a 1403 mdl N1 for use in a S/360 mdl 22, 25, 30, 40 or 50, see #6420 below.

SELECTIVE TAPE LISTING FEATURE (#6420). [Mdl N1 only ... for use in S/360 mdl 22, 25, 30, 40 or 50 only] Permits preparation of eight 1.5" or four 3.1" fanfold tapes ... up to 13 characters per 1.5" tape, up to 29 per 3.1" tape. Combinations of 3.1" and 1.5" tapes are possible. However, each 3.1" tape requires

one of the following pairs of 1.5" tape positions: 1 and 2, 3 and 4, 5 and 6, or 7 and 8. Each tape is individually spaced or skipped under program control. Skipping is CE adjustable between 3 and 22 inches. Five manual skip buttons control the four master tape positions ... the fifth button manually skips all tapes. Top front stacker and access window provide for front loading and unloading of tapes. Detection is provided for failure to line space. Easily interchangeable by operator between tape listing and standard forms printing. Improved operation with all covers closed -- low accoustical level. Can be used with an alphameric train or Universal Character Set Feature (#8640). **Limitation:** Cannot be installed on a 1403 mdl N1 attached to a S/360 mdl 25 via the Integrated 1403 Attachment (#4590). **Prerequisite:** Selective Tape Listing Control (#6425) on the 2821 Control Unit.

UNIVERSAL CHARACTER SET FEATURE (#8640, 8641). [For S/360 mdl 22 thru 195, any S/370 Processor or any 4300 Processor] #8640 -- for mdl 3 or N1 ... #8641 -- for mdl 2 or 5. Required on a 1403 mdl 2, 3, 5 or N1 for any print arrangement other than a 48-character set composed of identical arrays of standard character sequence. Any set of 240 codes can be loaded from cards into a special storage unit in the 2821 Control Unit mdl 1, 2, 3 or 5, or a 3125 Processing Unit.

The 240 codes must correspond in sequence to codes assigned to the graphics on the chain or train selected. This includes any announced print arrangement for S/360, 1400 series systems, or any arrangement of characters selected/designed by the customer for optimization of his application requirements ... see "Type Catalog." Charges for artwork, matrix, etc., for special slugs are to be added if applicable.

Note: This feature provides the same function as the Multiple Character Set Feature (#5110, 5111) on the 1403 mdl 2 or N1 when attached to a 2025 Processing Unit via the Integrated 1403 Attachment (#4590) ... see Multiple Character Set Feature above. If 1403 is already equipped with the MCS Feature (#5110, 5111), do NOT order #8640 or #8641.

A 1403 with Multiple Character Set Feature can be attached to a 2821 Control Unit equipped with the appropriate UCS Adapter (#8637, 8638 or 8639) or to a 3125 Processing Unit with appropriate features (#4662 or #4668).

Limitations: (1) Printing speed of the 1403 mdl 2 is limited to 750 lpm; that of the 1403 mdl 5 to 585 lpm; that of the 1403 mdl 3 or N1 to 1,400 lpm ... (2) The allowable code/graphic selection is restricted to the 256 code positions of the EBCDIC Code ... see SRL GA24-3312.

Prerequisites: For each 1403 with #8640 or #8641, the appropriate UCS Adapter is required on the 2821, 3125, 3135-3 or 3138 ... see "Special Features" under the appropriate unit ... for mdl 2, Interchangeable Chain Cartridge Adapter (#4740) ... for mdl 3 or N1, each different train arrangement requires its own 1416 Interchangeable Train Cartridge ... for S/360 mdl 22 thru 195, S/370 mdl 115 thru 168, and 4331 and 4341 Processors, Utility Load Program 360P-UT-048.

Note: If this feature is to be installed on a 1403 mdl 2 or 5 equipped with a fixed cartridge and an AN or HN arrangement, Interchangeable Chain Cartridge (#4740) must also be ordered. Specify any two UCS print arrangements ... see Type Catalog, "S/360, S/370 and 4300 Processors - 1403 and 1404 Printers."

If customer desires to retain the former arrangement and to receive one additional one, the fixed cartridge will be modified for interchangeability and an additional interchangeable cartridge with selected print arrangement will be furnished.

If #4740 is already installed with AN or HN arrangements, and customer desires to change to any other arrangement(s), order new chain(s) as follows:

Rental Customer -- for UCS feature, specify print chain feature #s ... see "Type Catalog."

Purchase Customer -- purchase new chain(s) ... see "New Print Chains" under "S/360, S/370 and 4300 Processors -- 1403 and 1404 Printers" in "Type Catalog."



1403 PRINTER (cont'd)

Special Feature Prices:	-- FTP/ --			Purchase	MMMC	FIC
	MAC/ MLC	MLC	MLC			
Aux Ribbon Feed #1376	\$ 88	\$ 81	\$ 74	\$ 2,000	\$26.00	\$ 88
Interchangeable Chain						
Cartridge Adapter 4740	88	81	74	2,030	NC	60
Multiple Character Set Feature						
for mdl 2 5110	11	10	9	299	2.50	†
for mdl N1 5111	11	10	9	426	2.50	†
Numeric Print Fea 5381	267	246	224	5,865	14.00	PO
Preferred Char Set 5523	46	42	39	1,385	3.00	42
Selective Tape Listing Feature						
for mdl 3 or N1 6410	225	207	189	7,505	15.00	432
for mdl 1 or 2 6411	225	207	189	5,260	15.00	246
for mdl N1 (new) 6420	334	307	281	11,010	39.50	1,265
Universal Character Set Feature						
for mdl 3 or N1 8640	11	10	9	426	2.50	††
for mdl 2 or 5 8641	11	10	9	299	2.50	197

** FTP is 12-23 months.

Accessories: The following item is available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in M10000 pages. See M10000 for additional information and field installation.

Stacker (#6413) -- for use with Selective Tape Listing Feature (#6410 or #6411) which is prerequisite.

† Charge must be obtained from IBM.

†† FIC for model 3 is \$191 ... for model N1 is \$119.



1404 PRINTER

Purpose: Printed paper and card document output unit for a 1401 (except A, D, G and H mdls), or S/360 mdl 25, 30, 40 or 50.

Highlights: Has all continuous form printing functions of the 1403, plus a dual channel cut-card feeding mechanism mounted on the left of the continuous form printing stations. Printing assembly is shifted to the cut-card or continuous form printing positions in a few seconds by the operator. Card documents and continuous forms cannot be printed on the same run. Cut-card feed becomes operative when printing assembly is shifted to the card side. The printing assembly has 132 print positions and has all 1403 features. Operation for printing continuous forms is identical to that of the 1403.

Card Printing -- during single card feeding, cards can vary in width from 51-column (4.852") to 80-column stub (14.75"). When feeding two cards, two 51-column or two 80-column cards can be printed at one time. Cards can vary from .006" to .009" in thickness. The number of cards printed per minute depends upon factors such as lines per document, position of first printed line, and number of lines per inch. Speeds up to 800 documents/minute are possible with the dual card feed capability.

PREREQUISITES:

For S/360 -- a 2821 Control Unit mdl 4.

For 1401 -- Printer (1404) Adapter (#5563) and Print Control (#5539) on the 1401 Processing Unit ... can be field installed on 1401 B, C, E, F mdls serial no. 26410 or above ... see 1401. **NOTE:** Print Control is standard on 1401 C mdls and need not be ordered.

Bibliography: S/360 -- GC20-0360, 1401 -- GA24-1495

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: Color Accent -- #9043 for blue, or, if other system units are to have red, yellow or gray accents, #9044 for charcoal. Extended Color -- #9031 for red, #9032 for yellow, or #9033 for blue.

[3] System/360 Adapter: #9709. Required when 1404 is to be attached to a 2821 mdl 4 ... also see [4] below.

[4] Print Chain Arrangement: One feature # unless Interchangeable Chain Cartridge (#4740) is ordered. See "Special Features" below and appropriate section of "Type Catalog."

When #9709 is field installed, the standard configuration chain previously used will be modified to an AN or HN arrangement of the same type size or style. See "Type Catalog - S/360 and S/370 - 1403 and 1404 Printers" for feature # to which chain is to be modified. Submit specifying "Change installed chain #_____ to #_____."

If Interchangeable Chain Cartridge Adapter (#4740) is installed, both alphameric chains (standard configurations only) will be modified, one to an AN and one to an HN. Modification is restricted to same type size or style as previously installed. Submit MES as indicated above.

[5] Up-ending Kit: #9840, if required. Loan basis, remains property of IBM.

[6] Tape Punch: Order Part No. 120910 if the 1404 is for a New Name Account. One punch is furnished at no charge per installation.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC	
	1404	2	\$1,680	\$81,790	\$645

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Metering: I/O Unit (Online) Warranty: B Maintenance: C
Purchase Option: 45% Per Call: 3

SPECIAL FEATURES

INTERCHANGEABLE CHAIN CARTRIDGE ADAPTER (#4740). Permits operator to insert changeable chain cartridge with different type font, style or special character arrangement. The change can be made quickly without special tools. Operation of the printer remains unchanged. Two interchangeable cartridges with chains are supplied, one in lieu of the standard fixed cartridge and one additional. Depending upon system, see appropriate section of the "Type Catalog" for feature #s of available arrangements.

For Plant Installation -- specify #4740 and any two alphameric print chain arrangements.

For Field Installation -- the installed fixed cartridge is modified for interchangeability and an additional interchangeable cartridge with chain is supplied. Specify #4740 and any one alphameric chain arrangement. **[Note:** When an installed 1404 is to be modi-

fied for use with a S/360, both alphameric chains will be modified at no charge ... see [4] under "Specify" above.]

READ-COMPARE (#5990). Permits the 1404 to read any 30 columns of the card(s) being processed. By programming, this data can be compared with the data being printed on the card(s) ... eliminates need for an off-line proof. **Prerequisite:** Read-Compare Adapter (#5991) on the 1401 Processing Unit or 2821 Control Unit mdl 4.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC	
Interchangeable Chain Cartridge Adapter	#4740	\$ 91	\$ 3,400	NC	\$ 65
Read-Compare	#5990	190	10,620	\$39.00	177

**1412 MAGNETIC CHARACTER READER**
[No longer available]

- The following specifications can be changed in the field.

[1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V.

[2] Field Lengths: Two feature #s, one for Account Number, one for Process Control, from table below. Field lengths can be changed in the field

Length	2	3	4	5	6	7	8	9	10
Acct No				9210	9211	9212	9213	9214	9215
Proc Cntrl	9190	9191	9192	9193	9194	9195			

[3] Color: Color Accent -- #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. Extended Color -- #9031 for red, #9032 for yellow, or #9033 for blue.

[4] Kickstrips: #9431 ... field installable. When kickstrips are installed, the open area underneath the machine is enclosed. This reduces the amount of "toe-room" for operator and may be inconvenient to customer if the power outlet is located under machine.

[5] Isolation Feature: May be required on units shipped prior to December 29, 1967 for attachment to S/360 mdl 30 ... see "Special Features" below.

- The following special features are on an "as available" basis for field installation.

DOCUMENT COUNTER (#2385). Six-position counter which counts all documents passing thru machine. On and Off Control and Reset provided on operator's panel.
Maximum: One.

DASH SYMBOL TRANSMISSION (#3215). [Units serial no. 10058 or above only] Transmits the E13B dash symbol from transit field to storage ... with symbol in storage, program can distinguish between duplicate Canadian and U.S. transit numbers.
Maximum: One.

ENDORSER PLATE The endorser plate is a purchase item made to the customer's specifications. For description and field installation, see M10000 pages. It is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

ISOLATION, CONTROL UNIT (#4700). [Field installation only on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 1412 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisites:** S/360 Adapter (#7720) ... in all cases there are compatible EC level requirements,

MULTIPLE COLUMN SELECT - SORT SUPPRESS (#5215). Operator's panel controls all operations of the feature. Multiple Column Select -- selects documents with specific numbers in four or less columns of any field. The numbers can be in a field other than that being sorted and the four columns need not be adjacent. Sort Suppress -- suppresses sorting on specific digits in any single column and selects those documents into a specific pocket. All other documents are sorted manually. Overflow stacking eliminates stoppage due to filled pockets. **Limitation:** Multiple column select and sort suppress cannot be simultaneous. **Maximum:** One.

SELF-CHECKING NUMBER (#7061, 7062). A self-checking number has two parts, the basic identifying number and its check digit. The check digit, derived from the identifying number by one of two techniques, is always the units digit of a self-checking number. The feature assures that all digits in the self-checking number have been correctly recorded. The field is verified as it is read during any pass. **Limitation:** Self-checking numbers for Modulus 10 are not compatible with those of Modulus 11.

#7061 - **Modulus 10** -- has weighting factor of 1, 2, 1, 2, 1, 2. Will not detect following types of errors: 09 to 90 transposition ... interchange of digits between alternate columns, e.g., 32647 for 34627 ... substitution of one self-checking number for another ... in some instances, transpositions having the formula "BAB" for "ABA", e.g., 121 for 212 ... in some instances, random errors, e.g., 23 printed as 56.

#7062 - **Modulus 11** -- has weighting factor 7, 6, 5, 4, 3, 2. When the self-checking number is greater than six digits, weighting factor is repeated. In some instances, random type errors will not be detected, nor can a basic number requiring a check digit of 10 be used.

S/360 ADAPTER (#7720). [1412s serial no. 10085 or above only] Permits operation with a S/360 mdl 25 or 30. **Limitation:**

Once this feature is installed, the 1412 cannot be used with a 1400 series processor. **Prerequisites:** In order to operate with DOS or BPS, Direct Control (#3274) or External Interrupt (#3895) is required on the processing unit ... to operate with DOS, the 1412 must have EC 131182. **Note:** Inter-system attachment via Direct Control is limited when the 1412 uses the external interrupt lines. Signal in lines used by 1412s cannot be shared with the second processing unit.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC	
Document Counter	#2385	\$ 16	\$ 674	\$ 3.00	\$ 23
Dash Symbol Trans	3215	56SUC	38	NC	22
Isolation Control Unit	4700	NC	NC	NC	NC
Multiple Column Select- Sort Suppress	5215	54	2,445	3.00	189
Self-checking Number Modulus 10	7061	42	2,110	2.50	32
Modulus 11	7062	70	3,260	3.50	26
S/360 Adapter	7720	108	5,770	10.00	575

1416 INTERCHANGEABLE TRAIN CARTRIDGE

Purpose: A cartridge and print train which provides interchangeability of type font for the 1403 Printer mdl 3 or N1, and 3203 Printer (all mdls).

Highlights: At least one 1416 is required with each 1403 mdl 3 or N1 or 3203 (all mdls).

Interchangeability — when multiple 1416s are available, they may be interchanged by the operator, providing flexibility for printing different type fonts, type styles, or character arrangements. This flexibility opens new application areas with unique printing requirements such as form-letter writing, engineering and scientific data, chemical abstracts, and text printing.

PREREQUISITES: The 1416 functions only when mounted in a 1403 mdl 3 or N1, or a 3203 (all mdls).

Bibliography: S/360 — GC20-0360, S/370 — GC20-0001, 1410/7010 — GA22-6826, 1440 — GA24-3005, 1460 — GA24-1495, 7070/7074 — GA28-6288.

Specify: Print Train Arrangement — see "Type Catalog" for characters in each available arrangement and feature #s to be specified.

- [1] A rental 1416 must be capacity replaced (unless customer desires to order an add'l 1416) when the following are to be field installed:
 - a) Preferred Character Set Feature (#5523) on 1403 mdl 3 in 1400 series system.
 - b) Universal Character Set Feature (#8640) on 1403 mdl 3 or N1 in S/360, S/370, 4300 Processors.
 - c) Any UCS train arrangement to replace AN or HN arrangement on a 3203 (all mdls), or a 1403 mdl 3 or N1 already equipped with Universal Character Set Feature (#8640).
 - d) A change in type size or style.

[2] When a Voltage Adapter (#9709) is field installed on a 1403 mdl 3, the standard configuration train previously used will be modified to an AN or HN arrangement; a PCS-A arrangement will be modified to a PCS-AN; or PCS-H will be modified to PCS-HN. Any of these changes is restricted to the same type size (style). See "Type Catalog - S/360, S/370 and 4300 Processors — 1403 and 1404 Printers" for feature # to which train is to be modified. Submit _____ on 1416, specifying "Change installed train # _____ to # _____."

[3] Except as stated in [1] and [2] above, order type slug substitutions whenever changes between the following train arrangements are to be made in the field: A and H ... AN and HN ... PCS-A and PCS-H ... PCS-AN and PCS-HN. See "Type Catalog" for applicable charges.

[4] A separate 1416 is required for each print train.

[5] Depending upon the system involved, see appropriate section of "Type Catalog" for feature numbers of desired OCR arrangements and associated sales manual "Reader" description pages to assure compatibility of printer/reader recognition ability. **Note:** The ribbons used on the 1403 and 3203 must be capable of producing printed characters suitable for recognition by the optical reader used. Recommended ribbons and document specifications are referenced in the optical reader "Machines" pages.

[6] Cross reference Branch/Plant Order No. of 1403 and 3203 on which 1416 will be used. If multiple 1416s are ordered, reference appropriate 1403 or 3203 order number(s). The required information should be entered into the "Remarks Section" of the order at order entry time.

[7] Storage Container: #9668, if needed for the 1416. [Recommended for use when multiple 1416s are ordered for a single printer.]

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC	
	1416	1	\$ 101	\$2,665	TM

Plan Offering: Plan B Purchase Option: 55% Per Call: 3
Warranty: B

Inspection: Field inspection of damaged 1416s will be at no charge (except for travel time and expense, if applicable).

Repair: Purchased 1416s which become damaged or inoperable may be returned to the IBM plant _____ for repair. Transportation charges to and from the plant are to be paid by the customer. The following repairs will be performed at the prices indicated per 1416:

Disassemble, inspect, test, clean, replace idler gear and drive gear, and reassemble	\$ 360††
Replace cams on original base plate assembly	230
Replace base plate assembly (856186)	745
Replace standard type slug†	2¢ per slug

† When a character is replaced, all identical characters should be replaced to ensure consistent print-out of identical characters. Unless otherwise specified, the plant will replace these slugs at the stated price per type slug. See "Type Catalog."

When replacement of special characters (special slugs) is required, the original charges (excluding artwork and matrix charges) for those special characters will apply for this replacement.

†† During the fourth thru twelfth month of the warranty period, this labor charge is \$105. There will be no charge for replacement of defective parts during this period. After the twelfth month, when the warranty has expired, the charge will remain at \$360, plus the cost of additional necessary replacement parts.

In the event a 1416 is damaged to the point where, in the opinion of IBM, repair is not possible, the 1416 will be returned to the customer. In this case, none of the prices listed above will apply.

1419 MAGNETIC CHARACTER READER

Purpose: Reads magnetically inscribed data from card and paper documents into a 1401, 1410, 1460, S/360 mdl 22, 25, 30, 40, 50, 65, 67, any S/370 Processor, or any 4300 Processor. Can be used for off-line sorting.

For possible use with the S/360 mdl 20, see GSD manual.

Highlights: Documents read at a maximum rate of 1,600 documents a minute. Actual speed depends upon length of document and stored program. Contains the standard features and performs all functions of a 1219 Reader Sorter. Pocket selection may be controlled by the 1419 or system's program. Feeding is controlled by the system. Can also be used for off-line sorting. Processing Overlap (#5730) is required on the 1401 or 1461 (1460) to take full advantage of the 1419's speed. Individual fields can be processed immediately after they are read. Document reading can be overlapped with processing. Minimum processing time, including pocket selection, is 32.2 milliseconds ... more than ample for sophisticated applications.

Documents -- magnetic characters must be recorded in the type font (E13B) and location designated by American Bankers Association Technical Committee on Mechanization of Check Handling. Intermixed paper and card documents within the following specifications can be processed: Width -- 2-3/4" to 3-2/3" ... Length -- 6" to 8-3/4" ... Thickness -- .003" to .007" ... Paper Stock -- 20 lb. short grain to 44 lb. card stock. 51-column card stock can be fed at a rate of approximately 1,960 cards a minute. **Note:** For sorting 51-column cards, see 51-column Card Sorting (#4380) under "Special Features."

Checking -- readability of each magnetic character, including special symbols, in each field processed can be verified each time a document is read and/or sorted. A field length check is made on all fixed length fields being processed to assure that all numeric digits in the field have been printed. Documents not satisfying checking conditions are rejected. Fixed field lengths provide a powerful technique for controlling accuracy of processing.

Programming Compatibility -- reprogramming is required whenever:

- A 1419 replaces a 1412 in an existing 1400 series installation.
- A S/360, S/370 or 4300 Processor replaces a 1400 series installation.
- A S/360 mdl 22, 25, 30, 40, 50, 65, any S/370 or 4300 Processor replaces a S/360 mdl 20.
- A conversion is made from one programming system to another.

PREREQUISITES:

S/360 mdl 22, 25, 30, 40, 50, 65, 67, any S/370 or 4300 Processor -- each 1419 requires a S/360 Single Address Adapter (#7720) or S/360 Dual Address Adapter (#7730) ... see "Special Features" below. Each 1419 requires a channel control unit position.

S/360 mdl 25 -- special feature on 2025: Multiplexer Channel, or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 65, 67 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on a 2870 ... see 2860, 2870.

S/370 mdl 115, 125 -- Byte Multiplexer Channel (special feature), External Signal (#3898) ... see 3115, 3125. On a 3115-0, #9336 is required.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channels (special features) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

S/370 mdl 165, 168 -- selector channel of 2860, basic multi-

plexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional).

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard).

Note: Before ordering, read descriptions of #7720 and #7730 under "Special Features" below for further prerequisites and limitations.

1401/1460 -- one 1419 can be attached. A Serial I/O Adapter (#7080) is required on the 1401 or 1441 Processing Unit. **Note:** For optimum operation, Processing Overlap (#5730) is recommended on the 1401 or 1461 I/O Control. Without it, a maximum of 9.5 milliseconds are available for processing of data from the 1419. **Limitations:** A 1419 cannot be installed with 1401 A, G or H models ... on a 1401, diagnostic programs require a minimum of 4,000 positions of storage.

1410 -- one 1419 can be attached to each channel ... simultaneous use of two 1419s increases the number of documents converted up to 90%, exclusive of operator handling time. A Magnetic Character Reader Adapter (#4900, 4902, 4903) is required on the 1411 Processing Unit. **Limitation:** Can be installed only on 1411 mdls A1 thru A5.

Limitations:

S/360 mdl 25, 30 -- operation of 1419s is not included under 1401/1440/1460 Compatibility features.

S/360 mdl 40 -- operation of 1419s is not included under 1401/1460 Compatibility (#4457) or 1410/7010 Compatibility (#4478).

S/360 mdl 50 -- operation of 1419s is not included under 1410/7010 Compatibility (#4478).

S/360 mdl 67 -- only when operating in mdl 65 mode.

S/370 mdl 115 -- operation of 1419s is not included under S/360 Mdl 20 Compatibility (#7520).

S/370 mdl 125 -- operation of 1419s is not included under 1401/1440/1460 Compatibility (#4457) or S/360 Mdl 20 Compatibility (#7520).

S/370 mdl 135, 135-3, 138 -- operation of 1419s is not included under 1401/1440/1460 Compatibility (#4457).

S/370 mdl 145, 145-3, 148 -- operation of 1419s is not included under 1401/1440/1460 Compatibility or 1401/1440/1460, 1410/7010 Compatibility (#4458).

S/370 mdl 155, 158 -- operation of 1419s is not included under 1401/1440/1460, 1410/7010 Compatibility (#3950).

4331 Processor -- operation of 1419s is not included under 1401/1440/1460 Compatibility (#3950).

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001, 1401/1460 -- GA24-1495, 1410 -- GA22-6826.

Specify: [1] Voltage (AC, 1-phase, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Color: Color Accent -- #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. Extended Color -- #9031 for red, #9032 for yellow, or #9033 for blue.

[3] Field Lengths: Specify two feature #s, one for Account Number, one for Process Control ... see table below. Fixed field lengths assure maximum processing accuracy. Variable length fields may be specified in lieu of fixed lengths. Field lengths on installed machines may be changed

Fixed Field Length (pos)	1	2	3	4	5	6	7	8	9	10	Variable Field Length
Account Number					9210	9211	9212	9213	9214	9215	9219
Process Control	9190	9191	9192	9193	9194	9195					9189

[4] Shipping Instructions: #9691 for stackers assembled (sorter section 35-3/4" deep), or #9692 for stackers disassembled (sorter section approximately 32" deep).

[5] Up-ending Kit (sorter section only): #9840, if required ... loan basis on initial machine order only, remains property of IBM. **Note:** also see [9] below.

1419 Magnetic Character Reader (cont'd)

- [6] System 360 Model 20 Attachment: #9710. See GSD sales manual for details. Note: With #9710 installed, the 1419 cannot be used interchangeably with a 1400 series processor or a S/360 mdl 22, 25, 30, 40, 50, 65, 67, any S/370 Processor or any 4300 Processor.
- [7] Kickstrips: #9431, if desired ... When kickstrips are installed, the open area under the machine is enclosed. This reduces the amount of "toe-room" for the operator and may be inconvenient to the customer if the power outlet is located under the machine.
- [8] Isolation Feature: May be required on units shipped prior to December 29, 1967 for attachment to a S/360 ... see "Special Features."
- [9] Crane/Hoist Cable: #9070 ... specify only if delivery of machine requires lifting by crane or hoist. Loan basis on initial machine order only, remains property of IBM. Prerequisite: Up-ending Kit (#9840).

PRICES: Mdl	MAC/MRC	Purchase	MMMC
1419 1	\$2,665	\$120,100	\$418

Plan Offering: Plan A, Additional Use Charge Rate: 30%
 Metering: I/O Unit (Online/Offline) Maintenance: C
 Purchase Option: 50% Warranty: B Per Call: 3

SPECIAL FEATURES

BATCH NUMBERING (#1445). Provides an automatic means of advancing a batch number document identification under program control. Consists of a 6-position impact printer which prints up to 999,999. The five low-order digits are advanced under processor control ... the high-order digit is set manually. The batch number can be printed in any one of six locations on the back of the document. **Limitations:** [1] Batch number advance instructions given more often than once in a given three second period will cause suspension of feeding for remainder of period. Minimum batch sizes that can be processed without restriction are influenced by those factors affecting throughput. Refer to Reference Manual ... [2] Legibility of batch numbers is influenced by the quantity of reverse side printing, the color and density of the ink used in reverse side printing, and surface irregularities caused by the printing process used. Typical examples of documents with one or more surface irregularities are Traveler's and Certified Checks. Customers must be advised that on these types of documents reduced ribbon life can be expected ... [3] When 51-column cards are processed, print location 6 cannot be used ... [4] This feature is not available for use in 1410 systems ... [5] Cannot be installed with Endorser (#3791). Uses purple ribbon (413193), or equivalent. See SRL GA24-3342 for details. Prerequisite: For field installation, 1419 must have EC 127244 or above.

DASH SYMBOL TRANSMISSION (#3215). Transmits the E13B dash symbol from transit field to storage. With symbol in storage, program can distinguish between duplicate Canadian and U.S. transit numbers. **Maximum:** One.

ELECTRONIC ACCUMULATOR AND SEQUENCE CHECKING (#3610). [Plant installation only] Accumulating -- amounts read from documents and accumulated total printed on paper tape. Maximum accumulation is ten digits. Rejected documents not accumulated. Sequence Checking -- selected positions in a field compared with same positions in preceding documents to assure that all documents are in proper order. Maximum of ten positions can be sequence checked in single pass. **Limitation:** This feature does not function when 1419 operates in "online" mode with any S/360, S/370 or 4300 Processor. Note: This feature is a separate unit, cable connected to 1419 ... 17" x 20-1/2" x 38-1/2" ... weight, 105 lbs. Prerequisite: Multiple Column Control (#5201).

ENDORSER (#3791). [Plant installation only] Imprints full endorsement at speed of 1419. Operator can select one of six endorsing positions in accordance with ABA specifications. With this feature, documents can be endorsed with date, identification number and bank's legal endorsement. The Endorser Plate is made to the customer's specifications. See "Accessories" below. A Blank Endorser Plate is also available if only partial endorsements are required. **Limitation:** Cannot be installed with Batch Numbering (#1445) or Endorse Only (#3795).

ENDORSE ONLY (#3795). [Plant installation only ... if Endorser (#3791) is installed, it can be changed in the field to #3795.] Imprints full endorsement at speed of 1419. Vertical location of endorsement is specified by customer and set at plant. A left or right printing position can be selected by operator. Identification number printing is not provided. The date printing unit is at trailing end of endorsing device. With this feature, documents can be endorsed with date, identification number and bank's legal endorsement. The Endorser Plate is made to the customer's specifications. See "Accessories" below. A Blank Endorser Plate is also

available if only partial endorsements are required. **Specify:** #9167 for endorsement at top, #9618 for center, or #9169 for bottom. **Limitation:** Cannot be installed with Endorser (#3791).

EXPANDED CAPABILITY (#3800). Provides a command for operation under OS. When in OS mode, stacker select time available using the Dual Address Adapter (#7730) is reduced by 2 ms. Exposure to data overruns caused by 1419s interfering with other 1419s operating on the same channel is eliminated. Overrun exposure and maximum number of 1419s per channel are configuration and application dependent ... refer to .SRL GC21-5006. Compatibility with DOS Dual Address Support is provided for conversion to OS. OS or DOS mode of operation is established by a field modification to the feature by FE. **Prerequisites:** Each 1419 requires the Dual Address Adapter (#7730) ... EC 259399 is required on a S/360 mdl 50, and EC 712822 is required on a 2870 for operation on a S/360 mdl 65 or S/370 mdl 165.

51-COLUMN CARD SORTING (#4380). For sorting 51-column card documents, which may be intermixed with documents and cards within the specifications listed under "Documents" above. When installed, machine speed is reduced. Formula for calculating feeding rate is:

$$15,720 + (L + .725L) \dots \text{where } L \text{ is document length in inches.}$$

For 51-column cards, speed is approximately 1,875 documents/minute ... for 6-inch documents, approximately 1,515 documents/minute. Decks containing 51-column cards must be mechanically joggled prior to each pass.

ISOLATION, CONTROL UNIT (#4700). [Field installation on units shipped prior to December 29, 1967 only ... standard on units shipped after that] To turn power on or off on the 1419 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisites:** S/360 Adapter, Single Address (#7720) or Dual Address (#7730) ... in all cases there are compatible EC level requirements

MULTIPLE COLUMN CONTROL (#5201). To select documents with specific number in four or less columns of any field.

PROGRAM CONTROL FOR POCKET LIGHTS (#5739). To facilitate control of output batches in the transit application. On 1419s attached to S/360, S/370, 4300 Processor, 1401 or 1460, the program stops the 1419 when a predetermined number of documents has entered one of six pockets designated by the program and turns on the appropriate pocket light(s) [A-3]. **Limitation:** Not available for use in a 1410 system.

PROGRAM CONTROL FOR POCKET LIGHTS, 7-12 (#5741). Facilitates control of output batches in the transit application when more than six pockets are being filled. Provides lights for pockets 4-9, enabling program to turn on light(s) for any of the first twelve pockets designated. **Limitation:** Not available for use in a 1410 system. **Prerequisites:** Program Control for Pocket Lights (#5739), plus EC 125358A, or, for field conversion, FBM 488231.

SELF-CHECKING NUMBER (#7061, 7062). A self-checking number consists of two parts, the basic identifying number and its check digit. The check digit, derived from the basic identifying number by one of two techniques, is always the units digit of a self-checking number. The feature assures that all digits in a self-checking number have been correctly recorded. The field is verified as it is read during any pass. **Limitation:** Self-checking numbers for Modulus 10 are not compatible with those for Modulus 11.

#7061 - Modulus 10 -- has weighting factor of 1, 2, 1, 2, 1, 2. Will not detect the following errors: 09 or 90 transposition ... interchange of digits between alternate columns, e.g., 32647 for 34627 ... substitution of one self-checking number for another ... in some instances, transpositions having the formula "BAB" for "ABA" ... in some instances, random errors, e.g., 23 printed as 56.

#7062 - Modulus 11 -- has weighting factor of 7, 6, 5, 4, 3, 2 ... when self-checking number is greater than six digits, weighting factor is repeated. In some instances, random type errors will not be detected, nor can a basic number requiring a digit of 10 be used.

SPLIT FIELD (#7440). The first ABA dash symbol following a digit (e.g., a dash in units position of a field is ignored) will separate any field into two elements. Each of the elements may vary in length. With this feature, either element can be treated as a separate field. **Specify:** First Element (#9180) ... required when Self-checking Number (#7061; 7062) is ordered and is to operate only on the first element of the split field.

S/360 ADAPTER (#7720 for Single Address, #7730 for Dual Address). One of these adapters is required on each 1419 attached to a S/360 mdl 22, 25, 30, 40, 50, 65 or 67, any S/370 Processor or any 4300 Processor. **Limitation:** Once #7720 or #7730 has been installed, the 1419 cannot be used with a 1400 series processor **Maximum:** One

1419 Magnetic Character Reader (cont'd)
per 1419, #7720 or #7730.

S/360 Adapter - Single Address (#7720) -- up to six 1419s attached to a system are supported by DOS ... exposure to late stacker selects should be considered in determining the maximum number of 1419s that may effectively operate on a system, in addition to those factors outlined under DOS in "Programming." **Limitation:** Programming support precludes concurrent operation of 1419s equipped with #7720 and those equipped with #7730. **Prerequisites:** In order to operate with DOS or BPS, Direct Control (#3274) or External Interrupt (#3895) is required on the processing unit. **Note:** Intersystem attachment via Direct Control is limited when the 1419 uses external interrupt lines. Signal in lines used by 1419s cannot be shared with the second processing unit. To operate with DOS, the 1419 must have EC 131182. When equipped with #7720, it is recommended that 1419s be attached to a multiplexer channel and they should normally be the highest priority devices on the channel.

S/360 Adapter - Dual Address (#7730) -- with this feature more stacker select time is available than with #7720. Available stacker select time is based on the last field selected for reading; account number -- 27 ms, transit number -- 21 ms, serial number -- 15 ms. In order for these times to be valid, document field placement must be within ABA Common Machine Language Specifications. The feature includes two distinct control units ... each with a separate address, its own set of executable commands, and status and sense indicators. **Prerequisites:** If the 1419 is attached to a 2022 or 2030 multiplexer channel via #7730, 1419 Dual Address Compatibility (#9185) must be specified on the 2022 or 2030. If #7720 is changed to #7730 by MES, #9185 must be added to the 2022 or 2030.

----- DOS -----

Up to six 1419s attached to a system are supported by DOS. The limiting factors concerning the number of 1419s that may be attached to a system are stacker select time requirements and channel capacity. Since these factors are application and configuration dependent, consult the appropriate channel loading and DOS SRLs to determine the maximum number that may be operated effectively. **Limitation:** DOS support precludes concurrent operation of 1419s equipped with #7730 and those equipped with #7720 ... 1419s equipped with #7730 can be attached only to a multiplexer channel and should normally be the highest priority devices on the channel. **Prerequisites:** Direct Control (#3274), External Interrupt (#3895) or External Signal (#3898) is required on the processing unit (except the 4341 Processor). **Note:** Intersystem attachment via Direct Control is limited when the 1419 uses the external interrupt lines. Signals in lines used by 1419s cannot be shared with the second processing unit. For field installation of #7730, the 1419 must have EC 131196 or above.

----- OS -----

Limitation: 1419s equipped with #7730 (required for OS) can be attached only to a multiplexer channel, must be physically cabled last on the channel, and should be the highest priority devices on the channel. **Prerequisite:** For operation under OS, each 1419 must be equipped with Expanded Capability (#3800).

Accessories: The following items are available on a purchase only basis. For shipment with machine, order the desired Feature # indicated below at the price listed in M10000 pages.

Endorser Plate (#3792) ... for use with #3791 or #3795.
Blank Endorser Plate (#3793) ... for use with #3791 or #3795.

Note: When ordering #3792, it is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

See M10000 pages for description, ordering instructions, and field installation.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Batch Numbering	#1445 \$145	\$ 6,805	\$15.00	\$575
Dash Symbol Trans	3215 56SUC	38	NC	21
Elec Accum & Seq Ck	3610 293	10,620	31.00	PO
Endorser	3791 441	19,950	55.00	PO
Endorser Only	3795 293	13,100	35.50	PO
Expanded Capability	3800 181	8,185	1.00	108
51-col Card Sorting	4380 NC	NC	NC	NC
Isolation, Control Unit	4700 NC	NC	NC	NC
Multiple Column Cntrl	5201 58	2,445	3.00	189
Program Control for Pocket Lights				
pockets 1-6	5739 30	1,080	1.00	113
pockets 7-12	5741 10	426	1.50	65
Self-checking Number				
Modulus 10	7061 46	2,110	2.50	32
Modulus 11	7062 75	3,260	3.50	26
Split Field	7440 22	1,335	1.50	26
S/360 Adapter				
Single Address	7720 116	5,770	10.00	966
Dual Address	7730 315	14,210	13.00	966

**1441 PROCESSING UNIT**
(No longer available)

Model	Core Storage Positions (alphameric)	Storage Cycle Rate (milliseconds)	System
A2	2,000	.0111	1440
A3	4,000		
A4	8,000		
A5	12,000		
A6	16,000		
C4	8,000		
C5	12,000	.0111	1450
C6	16,000		

Model Changes: Any A model can be changed to another A model ... any C model to another C model.

The following specifications can be changed in the field.

- [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.
- [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.
- [3] Additional Disk Storage: #9010, maximum one. Required when the second 1311 mdl 2 is attached.
- [4] Card Image: #9035. Required if Card Image (#1531) is installed on a 1442 mdl 1, 2 or 4.

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
1441	A2	\$ 788	\$ 43,570	\$ 81.00
	A3	995	46,890	82.50
	A4	1,330	64,890	84.50
	A5	1,660	82,880	86.00
	A6	1,995	100,850	86.00
	C4	853	40,030	99.00
C5	1,180	58,130	101.00	
C6	1,515	76,120	102.00	

Plan Offering: Plan A, Additional Use Charge Rate: 30%
 Metering: Base Unit (meter on 1447 mdl 1) Maintenance: B
 Purchase Option: 50% Warranty: B Per Call: 3

The following special features are on an "as available" basis for field installation.

GENERAL PURPOSE FEATURES

BIT TEST (#1470). To test any position in storage for any bit.

INDEXING AND STORE ADDRESS REGISTER (#4631). [A mdls only ... standard on C mdls] Includes the following instructions: Indexing -- three index locations provided to modify addresses automatically. Store A-Address Register - Q (AAA) -- stores contents of "A" address register in (AAA) prior to reading next instruction. Store B-Address Register - H (AAA) -- stores contents of "B" address register in (AAA) prior to reading next instruction.

MULTIPLY-DIVIDE (#5275). Provides the following: Multiply -- an area of core storage must be set aside equal in length to combined lengths of multiplier and multiplicand, plus one. This area, or "B" field, is used to hold multiplier in high-order positions and develop product in low-order positions. Multiplicand is placed in "A" field. After multiplier has been moved to high-order positions of "B" field, multiply operation is executed. Upon completion, product is available beginning with units position of "B" field. Speed depends upon sizes of multiplier and multiplicand, e.g., a 6-position field multiplied by a 4-position field requires 1.89 milliseconds. Divide -- a field in which the quotient will be developed is set aside immediately to the left of the dividend field. This field must be equal in length to dividend field. Divisor can be any other place in storage. After divide operation is executed, quotient is available beginning with units position of field set aside for it ... remainder beginning with units position of dividend field. Speed depends upon length of expected quotient.

CARD I/O FEATURE

PUNCH COLUMN SKIP CONTROL (#5881). Required for Punch Column Skip (#5880) on 1442 Card Read Punch mdl 1 or 2 ... only one #5881 is required for #5880s on 1442s.

DISK STORAGE FEATURES

DIRECT SEEK (#3281). [Not available for mdl A2] Improves disk storage access time by moving 1311 access mechanisms directly to specified cylinder under program control. Maximum access is 250 milliseconds for 1311 mdl 1 or 2 ... 1,200 milliseconds for 1311 mdl 6 or 7. Average access is 150 milliseconds for 1311 mdl 1 or 2 ... 400 milliseconds for 1311 mdl 6 or 7.

Prerequisites: Direct Seek (#3283) on the 1311 mdl 1 or 6 and Direct Seek (#3282) on each 1311 mdl 2 or 7.

DISK STORAGE CONTROL (#3321). [Not available for mdl A2 ... standard on C mdls] To attach a 1311 mdl 1 or 6 with up to four 1311 mdl 2s or 7s and/or up to five 1301 disk arrays. **Note:** For 1301s, Expanded Disk Storage Control (#3832) is also required ... in addition, Additional Disk Storage (#9010) may be required. See "Specify."

EXPANDED DISK STORAGE CONTROL (#3832). [Not available for mdl A2 or C mdls] To attach 1301(s).

Prerequisite: Disk Storage Control (#3321).

SCAN DISK (#6396). [Not available for mdl A2] Provides automatic rapid search of 1301 or 1311 disk data for a specific identifier or condition ... only one #6396 is required for this function on both 1301s and 1311s.

SEEK OVERLAP ADAPTER (#6399). [Not available for mdl A2] Required for Seek Overlap (#6400) on 1311s. Not required for 1301s.

TRACK RECORD (#8011). [Not available for mdl A2] For 1301s -- stores one 2,543-character record on each track, increasing disk array capacity to 25,430,000 characters. For 1311s -- stores one 2,980-character record on each track, increasing disk pack capacity to 2,980,000 characters. Only one #8011 is required for this function on both 1301s and 1311s.

PRINTER FEATURES

EXPANDED PRINT EDIT (#3835). Expands print edit as follows: Asterisk Protection -- printing of high-order zeros replaced with asterisks until a significant digit is sensed. Floating Dollar -- printing of all high-order zeros is suppressed and a dollar sign prints immediately to the left of first high-order significant digit. Decimal Control -- when a decimal point is sensed, suppression of zeros is stopped unless a significant digit is not sensed in any of the positions to the right of the decimal point, in which case all zeros and decimal point are suppressed. Sign Control Left -- a "CR" or "-" character is printed in high-order position of control word if edited word is negative.

PRINTER ATTACHMENT (#5561). [A mdls only ... standard on C mdls] To attach a 1443 or 1445 Printer and/or a 1444 Card Punch to a 1440, or a 1443 to a 1450. **Note:** In a 1440, only one #5561 is required to attach both a printer and a card punch. **Limitation:** If a 1446 Printer Control and 1403 Printer are used in a 1440, this feature can be used only to attach a 1444. hours.

MAGNETIC TAPE FEATURE

TAPE ADAPTER (#7802). [mdls A3 thru A6 only] To attach a 7335 Magnetic Tape Unit mdl 1 or 2 to a 1440.

SERIAL INPUT/OUTPUT FEATURE

SERIAL INPUT/OUTPUT ADAPTER (#7080). [Not available for mdl A2 ... standard on C mdls] 1440 -- to attach a 1009 Data Transmission Unit, 1011 Paper Tape Reader, 1012 Tape Punch, 1231 Optical Mark Page Reader, 7740 Communication Control System, or Direct Data Channel (#3271). **Note:** On mdls A3-A6, an Expanded Serial I/O Adapter (#3845) may be used in lieu of #7080 ... see below. 1450 -- this feature is standard on C mdls and is used to attach the 1259 Magnetic Character Reader. **Prerequisite:** In a 1440, if a 7740 is to be attached via this feature, Emergency Power Off (#9144), a no-charge feature, is required on the 1441.

DATA TRANSMISSION FEATURES

CONSOLE ATTACHMENT (#2260). To attach a 1447 Console mdl 2 or 3 in addition to the required 1447 mdl 1. **Limitation:** Cannot be installed if a Transmission Control Unit Attachment - 1026 (#8024) is used.

DIRECT DATA CHANNEL (#3271). [Not available for mdl A2 or C mdls] A cable for direct data transfer between the 1441 and a 1401 (1401 system) or another 1441 (1440 system). The cable is connected to a Serial I/O Adapter (#7080) on each system ... see #7080 above. The cable can be manually attached or detached. When attached, no other attachment can be made to #7080. Only one #3271 is required and it can be ordered for either system, but Emergency Power Off (#9144), a no-charge feature, must be ordered for the other system. **Specify:** Length of cable to a maximum of 100 feet ... also identify other system and whether it is installed or on order. **Prerequisites:** Indexing and Store Address Register (#4631) and Serial I/O Adapter (#7080).



1441 Processing Unit (cont'd)

EXPANDED SERIAL INPUT/OUTPUT ADAPTER (#3845). [mdls A3-A6 only] To attach the 1441 (1440) directly to a 1411 or 7114 Processing Unit (1410 or 7010). This feature can also be used in lieu of a Serial I/O Adapter (#7080) for any of the attachments possible via #7080 ... #3845 and #7080 cannot both be installed. See SRL Reference Manual for details. **Specify:** Length of cable, to a maximum of 100 feet. **Prerequisites:** Bit Test (#1470) and Indexing and Store Address Register (#4631) ... Control Adapter (#1067, 1068) on 1411 or 7114 ... Priority Feature (#5620) and Processing Overlap (#5730) on 1411.

INTERRUPT (#4708). Allows processor to perform shared time operations. More time can be spent on processing and less on 1026 Transmission Control Unit operations. Programmed instructions which continuously test for line service will not be required.

Prerequisite: Transmission Control Unit Attachment - 1026 (#8024).

TIME EMITTER (#7958). Causes a process interrupt every 3.6 seconds for program simulation of a real time clock and/or interval timers. **Prerequisite:** Interrupt (#4708).

TRANSLATE FEATURE (#8023). [Not available for mdl A2] Provides a fast and flexible code translation capability for non-standard IBM codes.

TRANSMISSION CONTROL UNIT ATTACHMENT - 1026 (#8024). [Not available for mdl A2] To attach up to four 1026 Transmission Control Units and the 1447 Console mdl 1, and, if desired, a 1447 mdl 2. **Limitation:** Cannot be installed with Transmission Control Unit Attachment - 1448 (#8025) or Console Attachment (#2260). **Prerequisite:** In a 1440, Indexing and Store Address Register (#4631).

TRANSMISSION CONTROL UNIT ATTACHMENT - 1448 (#8025). [Not available for mdl A2 or C mdls] To attach a 1448 Transmission Control Unit. **Limitation:** Cannot be installed with Transmission Control Unit Attachment - 1026 (#8024). **Prerequisite:** Indexing and Store Address Register (#4631).

Special Feature Prices:		MAC/ MRC	Purchase	MMMC	FIC
• General Purpose Features					
Bit Test	#1470	\$ 20	\$ 848	\$ 1.00	\$ 11
Index & Store Address Register	4631	91	5,080	1.50	28
Multiply-Divide	5275	333	11,950	12.50	309
• Card I/O Feature					
Punch Col Skip Control	5881	10	529	1.00	35
• Disk Storage Features					
Direct Seek	3281	50	2,460	4.00	29
Disk Storage Control	3321	255	12,260	11.00	106
Exp Disk Storage Cntrl	3832	50	2,565	5.50	267
Scan Disk	6396	35	1,720	1.00	9
Seek Overlap Adapter	6399	NC	NC	NC	NC
Track Record	8011	40	1,960	1.00	9
• Printer Features					
Expanded Print Edit	3835	20	795	1.00	14
Printer Attach (for 1440)	5561	25	1,410	1.00	26
• Magnetic Tape Feature					
Tape Adapter	7802	118	7,295	2.50	162
• Serial Input/Output Feature					
Serial I/O Adapter	7080	101	3,845	2.00	80
• Data Transmission Features					
Console Attachment	2260	40	2,250	1.00	31
Direct Data Channel	3271	NC	NC	NC	NC
Expnd Serial I/O Adptr	3845	333	12,470	2.50	80
Interrupt	4708	101	4,625	1.50	21
Time Emitter	7958	10	476	1.00	44
Translate Feature	8023	61	3,075	3.00	88
Transmission Control Unit Attachment					
for 1026(s)	8024	50	2,670	1.00	71
for 1448	8025	152	6,920	2.50	101

**1442 CARD READ PUNCH - Models 1, 2 and N1**

Purpose: A combination punched card I/O unit for a 1240, 1440, 1450, S/360 mdl 22 thru 85 and 195, any S/370 Processor or any 4300 Processor.

Model 1 [No longer available] For 1240, 1440 or 1450 ... reads at rated speed of 300 cards/minute ... punches at rated speed of 80 columns/second ... has one stacker.

Model 2 [No longer available] For 1240, 1440 or 1450 ... reads at rated speed of 400 cards/minute ... punches at rated speed of 160 columns/second ... has two stackers.

Model N1 For S/360, S/370 or 4300 Processor ... reads at rated speed of 400 cards/minute ... punches at rated speed of 160 columns/second ... has two stackers.

Model Changes: Can be made between mdl 1 and 2 ... a mdl 1 or 2 can also be changed to a 1442 Card Reader mdl 4, but not vice versa ... no changes can be made to or from a mdl N1

Highlights: Format control and analysis are controlled by the system's processing unit. Model N1 reads and punches the 256 codes of the Extended BCD Code. Hopper capacity is 1,200 cards ... stacker capacity is 1,300 cards. In mdl N1, cards go to stacker 1 unless program directed to stacker 2. Model N1 contains its own control unit.

Input Section -- invalid codes and mispositioned cards are detected. The light-sensing mechanism is checked for proper functioning in every read cycle.

Output Section -- cards are punched serially after passing through the light-sensing station. Cards can be either blank or pre-punched. Actual punching speed depends upon the number of columns punched, including interspersed blank columns. Rated speed for punching columns 1-10 is 265 cards/minute for mdl N1 ... for punching columns 1-80 is 91 cards/minute for mdl N1. Punching is checked.

Card Limitations -- generally, scored cards require careful handling and a favorable environment. Use of the following scores has been approved.

Internal Scores (before separation) -- S-1, ID-1, ID-2, and for a maximum of three passes, M-4 and M-5.

External Scores (after separation) -- for reading and punching: On column 80 end -- M-3, M-7, M-11 (with round corners) or CF-11 (with round corners); On column 1 end -- an M-7, M-11 (with round corners) or CF-11 (with round corners) score may be used on a mdl N1 with serial no. 40044 or above, or a machine having punch unit serial no. 2638 or above stamped on the back of the tie bar. For reading without punching: On column 80 end, and for a maximum of three passes, M-5, OM-2 and CF-4.

All other scores may result in unsatisfactory performance.

Aqua cards and C-4 corner cut cards cannot be used.

Maximum: S/360, S/370 or 4300 Processor -- the 1442 mdl N1 includes its own control unit. The number attachable depends upon the total complement of I/O control units in the system. There is a natural limit of eight control units on each channel ... in a S/360 mdl 44, up to two control units can be attached to each High Speed Multiplexer Channel subchannel.

PREREQUISITES: For S/360, S/370 or 4300 Processor -- a control unit position on a system channel.

S/360 mdl 25 -- special feature on 2025: Multiplexer Channel or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), or Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, Add'l High Speed Multiplexer Subchannels ... see 2044.

S/360 mdl 65, 67, 75 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 85, 195 or S/370 mdl 165, 168, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, or shared subchannel of a 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- multiplexer channel (standard), Selector or

Block Multiplexer Channels (special features) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), block multiplexer channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), or block multiplexer channel (first two are standard) ... see 3155, 3158.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard) block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional).

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard).

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

The following specifications can be changed in the field (also applies to mdls 1 and 2).

Specify: [1] Voltage: Models 1 and 2 (AC, 3-phase, 4-wire, 60 Hz) -- #9903 for 208 V, or #9905 for 230 V ... Model N1 (AC, 1-phase, 3-wire, 60 Hz) -- #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or (mdl N1 only), #9046 for white.

[3] 1442 N1 Compatibility Attachment (mdl N1 only): May be required ... see "Special Features."

[4] Isolation Control Unit (mdl N1 only): May be required on units shipped prior to December 29, 1967 ... see "Special Features."

PRICES:	Mdl	MAC/ MRC	Purchase	MMM
	1†	\$ 352	\$14,280	\$68.00
	2†	498	15,130	83.00
	N1	661	19,990	152.00

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Metering: I/O Unit (Online) Maintenance: C
Purchase Option: 45% Warranty: B Per Call: 3

SPECIAL FEATURES

NOTE: On a 1442 mdl 1 or 2, the following features, as appropriate, are on an "as available" basis for field installation.

CARD IMAGE (#1531, 1532). In any system -- permits processing of cards with multiple punching in a single card column. In 1240, 1440 or 1450 -- converts binary coded cards into BCD codes, and vice versa ... approved scored cards can be read without suspending validity checking on other than scored columns ... cards with interspersed conventional codes and binary coded data can be read.

#1531 -- for mdl 1 or 2 ... #1532 -- for mdl N1.

When reading in card image mode, the validity check is suspended because all characters are considered valid. When installed on the first 1442 attached to a 1240, 1440 or 1450, this feature also functions on a second 1442. **Prerequisite:** For mdl 1 or 2 -- Card Image (#9035) on the 1241 or 1441 ... see "Specify" under 1241 or 1441.

1442 N1 COMPATIBILITY ATTACHMENT (#4445). [Mdl N1 only] Required if the 1442 mdl N1 is to be used with 1440 Compatibility (#4442) on a 2025, or with 1442/1443 Attachment (#4464) or 1620 Compatibility (#7190) on a 2030. Required only for operation in compatibility mode, not required for normal S/360 operation of the 1442 mdl N1. **Limitation:** Cannot be installed on a unit with serial no. under 40100.

ISOLATION, CONTROL UNIT (#4700). [Mdl N1 only ... for field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 1442 mdl N1 without generating spurious signals. Thus, a Processor program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Limitation:** Cannot be installed on a unit with serial no. under 40068. **Prerequisite:** in all cases there are compatible EC level

† No longer available.



1442 Card Read Punch - Models 1, 2 and N1 (cont'd)
requirements.

PUNCH COLUMN SKIP (#5880). [Mdl 1, 2 only] Increases system throughput by allowing the punch to space over card columns without interlocking the system ... a "Punch Column Skip" instruction specifies the number of card columns to be spaced through by the punch. If two 1442s, mdls 1 and 2 in any combination, are installed, each may be equipped with this feature. **Prerequisite:** Punch Column Skip Control (#5881) on the 1241 or 1441 ... only one #5881 is required if #5880 is installed on two 1442s.

SELECTIVE STACKER (#6406). [Mdl 1 only] Provides a second stacker ... cards can be selected into this stacker under program control.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC	
Card Image - for mdl 1, 2	#1531	\$ 35	\$1,260	\$1.00	\$ 41
for mdl N1	1532	36	1,260	1.00	42
1442 N1 Compat Attach	4445	NC	NC	NC	NC
Isolation, Control Unit	4700	NC	NC	NC	NC
Selective Stacker	6406	25	831	1.00	73

1442 CARD READER - Models 3 and 4
[No longer available]

Model 4 For 1240 or 1440 ... has two stackers.

Model Changes: A 1442 Card Read Punch mdl 1 or 2 can be field changed to a 1442 Card Reader mdl 4, but not vice versa.

Highlights: Provides high-speed, low-cost punched card input. Cards are read by a light-sensing unit at speeds up to 400 cards/minute. The 64 codes of the BCD Code can be read. Invalid codes and mispositioned cards are detected. The Light-sensing mechanism is checked for proper functioning in every read cycle. Has a 1,200-card capacity hopper and two 1,300-card capacity radial stackers.

Card Limitations; Generally, scored cards require careful handling and a favorable environment. Use of the following scores has been approved.

Internal Scores (before separation) -- S-1, ID-1, ID-2, and for a maximum of three passes, M-4 and M-5.

External Scores (after separation) -- column 1 end : OM-2, M-3, M-4, M-5, M-7, M-11 (with round corners), CF-4 and CF-11 (with round corners) ... column 80 end: M-3, M-6, M-7, M-11 (with round corners), CF-11 (with round corners), and for a maximum of three passes, M-5, OM-2, CF-4.

All other scores may result in unsatisfactory performance.

Aqua cards and C-4 corner cut cards cannot be used.

Maximum: Up to two 1442 mdl 4s can be attached to a 1240 or 1440 system.

Limitations: On a 1240 or 1440, if a 1442 Card Read Punch mdl 1 or 2 or a 1444 Card Punch is used, only one 1442 mdl 4 can be installed ... if two 1442 mdl 1s and 2s in any combination or both a 1442 mdl 1 or 2 and a 1444 are used, a 1442 mdl 4 cannot be installed.

Prerequisite: For 1240 or 1440 -- the first 1442 (mdl 1, 2 or 4) attached to the system must have a Card Read Punch Adapter (#1632) ... see "Special Features."

Bibliography: GA22-3005

The following specifications can be changed in the field.

[1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC	
	1442	4†	\$ 249	\$8,720	\$77.50

Rental Plan: Plan A, Additional Use Charge Rate: 30%
Metering: I/O Unit (Online) Maintenance: C
Purchase Option: 45% Warranty: B Per Call: 3

SPECIAL FEATURES

The following features, as appropriate, are on an "as available" basis for field installation on a 1442 mdl 3 or 4.

CARD IMAGE (#1531). [Mdl 4 only] To convert binary coded cards into BCD codes ... also permits processing of cards with multiple punching in a single card column. Approved scored cards can be read without suspending validity checking in other than the scored columns. When reading in card image mode, the validity check is suspended because all characters are considered valid. Cards with interspersed conventional punching codes and binary coded data can be read. When installed on the first 1442 attached to a system, this feature also functions on a second 1442 in the system. **Prerequisite:** Card Image (#9035) on the 1241 or 1441 ... see "Specify" under 1241 or 1441.

CARD PUNCH ADAPTER (#1632). [Mdl 4 only] Required on the first 1442 attached to a system ... the second 1442 does not require this feature. When a 1442 mdl 1 or 2 and a 1442 mdl 4 are both attached to a system, the 1442 mdl 1 or 2 must be the first unit attached and must be equipped with this feature.

INPUT/OUTPUT ADAPTER (#4661). [Mdl 3 only] To attach a 1414 I/O Synchronizer mdl 5 or 8 with the teleprocessing units or printer it controls to the 1442 mdl 3.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC	
Card Image	#1531	\$ 35	\$1,260	\$1.00	\$ 35
Card Read Punch Adptr	1632	25	1,260	1.00	70
Input/Output Adapter	4661	64	2,095	1.25	58

† No longer available.



1442 CARD PUNCH - Models 5 and N2

Purpose: Punched card output unit for a S/360 mdl 20 thru 75, any S/370 Processor or any 4300 Processor ... punches cards at a rated speed of 160 columns/second.

For use of the 1442 mdl 5 with an 1130 system, see GSD manual.

Model 5 For a S/360 mdl 20.

Model N2 For S/360 mdl 22 thru 75 any S/370 Processor and any 4300 Processor ... includes its own controls.

Model Changes: Changes between mdls 5 and N2 are not possible, nor are changes to any other 1442 model.

Highlights: Format control and analysis are performed by the system's processing unit. Blank or prepunched cards are punched serially. Actual speed depends upon the number of columns punched, including interspersed blank columns. Rated speed in cards/minute: Columns 1 thru 10 is 265 ... columns 1 thru 80 is 91. Punching is checked. The unit has a 1,200-card capacity hopper and a 1,300-card capacity stacker. The Extended BCD Interchange Code (256 codes) is punched. The model N2 requires Card Image (#1531) to punch binary codes. See "Special Features."

Maximum:

S/360 mdl 20 -- one 1442 mdl 5 can be attached to the 2020 Processing Unit ... see S/360 mdl 20 in GSD sales manual for allowable I/O unit configurations.

S/360 mdl 22 thru 75, any S/370 Processor and any 4300 Processor -- the number of 1442 mdl N2s that can be attached depends upon the number of available system channel control unit positions.

PREREQUISITES:

S/360 mdl 20 -- a 2020 Processing Unit submodel 1, 2, 5 or 6 equipped with a 1442 Model 5 Attachment (#4460) ... if the installed 2020 has a serial no. under 20000, a Cable Adapter (#9099) is required on the 1442. See "Specify" below.

S/360 mdl 22 thru 75, any S/370 Processor and any 4300 Processor -- an available control unit position on a system channel.

S/360 mdl 25 -- special feature on 2025: Multiplexer or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), or Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, or Add'l High Speed Multiplexer Subchannels.

S/360 mdl 65, 67, 75 -- selector channel of 2860, basic multiplexer channel of 2870, or Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channels or Block Multiplexer Channels (special features) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.

S/370 mdl 3145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

S/370 mdl 165, 168 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) of 2870, or the shared subchannel of a 2880 ... see 2860, 2870, 2880.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional).

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard).

Card Limitations: Generally, scored cards require careful handling and a favorable environment. Use of the following scores has been approved.

Internal Scores (before separation) -- M-4, M-5, S-1, ID-1.

External Scores (after separation) -- M-7, M-11 (with round corners), CF-11 (with round corners) on either end. M-3 on column 80 end only.

All other scores may result in unsatisfactory performance.

Aqua cards and C-4 corner cut cards

cannot be used.

Bibliography: S/360 mdl 20 -- GA26-3565, S/360 mdl 22 thru 75 -- GC20-0360, S/370 -- GC20-0001.

Specify: [1] Voltage (must be consistent with system voltage): Mdl 5 -- with S/360 mdl 20, #9903 for 208 V, or #9905 for 230 V. Mdl N2 -- #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Cable Adapter (mdl 5 only): #9099. Required if the 1442 is to be attached to an installed 2020 which has serial no. under 20000. Plant installation only, but can be removed in the field.

[4] Isolation, Control Unit (mdl N2 only): May be required on units shipped prior to Decmeber 29, 1967 ... see "Special Features."

[5] If the 1442 mdl 5 is to be used as an emulating unit in a S/360 mdl 20 with 1401/1440 Compatibility (#3901) see #3901 under 2020 (GSD manual).

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
1442	5	\$ 330	\$ 9,720	\$98.00
	N2	472	14,280	134.00

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Metering: I/O Unit (Online) Maintenance: C
Purchase Option: 45% Warranty: B Per Call: 3

SPECIAL FEATURES

CARD IMAGE (#1531). [Mdl N2 only] Permits punching of cards with multiple punching in a single column.

ISOLATION, CONTROL UNIT (#4700). [Mdl N2 only] For field installation on units shipped prior to December 29, 1967 ... standard on unit shipped after that] To turn power on or off on the 1442 mdl N2 without generating spurious signals. Thus, a Processor program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all case there are compatible EC level requirements,

Special Feature Prices:		MAC/MRC	Purchase	MMMC	FIC
Card Image	#1531	\$ 35	\$1,260	\$1.00	\$145
Isolation, Control Unit	4700	NC	NC	NC	NC



1443 PRINTER

Purpose: Printed output unit for a 1450, S/360 mdl 22 thru 85, 195, any S/370 Processor or any 4300 Processor.

- Model 3** [No longer available] For 1450 ... 140 lpm rated speed with 52-character set.
- Model 4** [No longer available] For 1450 ... 230 lpm rated speed with 52-character set.
- Model N1** For S/360 mdl 22 thru 85, 195, any S/370 Processor or any 4300 Processor ... 240 lpm rated speed with 52-character set.

NOTE: For speeds with other character sets, see Selective Character Set (#6402) under "Special Features."

Model Changes: Can be made in the field between mdls 3 and 4 only ... see "Limitations."

Highlights: Models 3 and 4 have 144 print positions ... standard on all other models are 120 print positions. On all models the 52-character set is standard. Actual speed depends upon the operation ... see Selective Character Set (#6402) under "Special Features." The system's processing unit performs all format and analysis control. A line of printing is presented to the printer in the arrangement in which it is to be printed.

Each print position can print any of 52 characters ... alphabetic, numeric and 16 special characters. Characters are spaced 10/inch. Line spacing is 6 or 8 lines/inch, under operator control. Marginally punched continuous forms from 4" to 16-3/4" in overall width are fed by an automatic carriage. Maximum form depth is 22" at 6 lines/inch ... 16-1/2" at 8 lines/inch. Forms spacing and skipping are controlled by a 12-channel tape in the carriage. Skipping is at approximately 15"/second.

An enlarged dash (character no. 830704) is available for printing on documents to be read by 1230, 1231 and 1232 optical mark readers. Depending upon the system, see appropriate section of "Type Catalog" for ordering instructions. The ribbon used on the 1443 must be capable of producing printed characters suitable for recognition by the optical reader used.

Limitations: When a model change is made between a mdl 3 and 4, serial no. 10330 and below, type bars (less segments) must be replaced ... replacement bars will be furnished at no charge on a one-for-one basis. Previously installed segments will be installed in the new type bar(s) without charge. Submit MES, indicating:

- (a) Model change from 3 to 4, or vice versa.
- (b) Feature #(s) and quantity of each character set requiring a new type bar.
- (c) Feature # for type size, #9731 for .079", or #9733 for .095".

A 120 print-position bar cannot be used in a machine equipped with Print Positions, 24 Add'l (#5558) unless one additional segment is added and all segments are rearranged in the required sequence ... conversely, a 144 print-position bar cannot be used in a 120 print-position machine unless one segment is removed and the remaining segments are rearranged in the required sequence ... see "Type Catalog."

Neither segments nor type bars are interchangeable between any model 1443 and 2203 Printers.

PREREQUISITES:

- For 1450 -- attachment features are standard on the 1441 and the 1443. **Limitation:** Only one printer, a 1443, can be attached to a 1450 system.
- For S/360, S/370 and 4300 Processors -- the 1443 mdl N1 includes its own control. It requires a control unit position on a system channel.

- S/360 mdl 25** -- special features on 2025: Multiplexer Channel, or Selector Channel ... see 2025.
- S/360 mdl 22, 30, 40, 50** -- multiplexer channel (standard), or Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.
- S/360 mdl 44** -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, Add'l High Speed Multiplexer Subchannels ... see 2044.
- S/360 mdl 65, 67, 75** -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.
- S/360 mdl 85, 195** -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, or the shared subchannel of a 2880 ... see 2860, 2870, 2880.
- S/370 mdl 115, 125** -- Multiplexer Channel (special feature) ... see 3115, 3125.
- S/370 mdl 135** -- multiplexer channel (standard), Selector

Channels (special features), or Block Multiplexer Channels (special features) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158, 3158-3.

S/370 mdl 165, 168, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) of 2870, or shared subchannel of 2880. ... see 2860, 2870, 2880.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.

Bibliography: 1450 -- GA24-3005, S/360 -- GC20-0360, S/370 -- GC20-0001

Specify: [1] Voltage: For 1450 (AC, 3-phase, 4-wire, 60 Hz) -- #9903 for 208 V, or #9905 for 230 V. For S/360 or S/370 (AC, 1-phase, 3-wire, 60 Hz) -- #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

- [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- [3] Print Arrangement for standard 52-character set unless Selective Character Set (#6402) is ordered and the 63-character set is desired instead ... see appropriate section of "Type Catalog" (page 41 or 81) depending upon the system involved. Character substitutions are also covered in the "Type Catalog."
- [4] Type Size: #9731 for .079", or #9733 for .095".
- [5] Order Tape Punch, Part No. 120910, if 1443 is for New Account Name ... one is furnished at no charge per installation.
- [6] Isolation, Control Unit (mdl N1 only): May be required on units shipped prior to December 29, 1967 ... see "Special Features" below.

PRICES: Mdl		- FTP / -		Purchase	MMMC
		MAC/MRC	MLC 1 yr*		
1443	3††	\$465	—	\$23,360	\$107.00
	4††	741	—	37,030	156.00
	N1	954	878	41,000	149.00

Plan Offering: Plan A, Additional Use Charge Rate: 30%
 Metering: I/O Unit (Online) Warranty: B Maintenance: C
 Purchase Option: 45% Upper Limit Percent: 0% Per Call: 3
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Model/Feature Charge in lieu of AU Charge: 10%

SPECIAL FEATURES

CHARACTER SETS #1890-1893, #1895-1896 for mdl 3 or 4 ... #1901-1904 for mdl N1. See "Type Catalog" for graphics and ordering instructions. **Prerequisites:** On mdl N1, Selective Character Set (#6402) is required for any character set other than #1903.

ISOLATION, CONTROL UNIT (#4700). [Mdl N1 only ... field installation on units shipped prior to December 29, 1967 only ... standard on units shipped after that] To turn power on or off on the 1443 mdl N1 without generating spurious signals. Thus, a Processor program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements.

PRINT POSITIONS, 24 ADD'L (#5558). [Standard on mdls 3, 4] #5558 -- for mdl N1. Increases print span from 120 positions to 144 positions. Operation of printer remains unchanged. When this feature is field installed, all character sets must be modified. This



1443 Printer (cont'd)

modification will be made at no charge, provided that only a standard segment is to be furnished ... see "Character Sets" in appropriate section of "Type Catalog." ordering #5558 should include the following: [1] Quantity and feature #(s) of all installed character sets that require an additional segment ... [2] Feature # for type size, #9731 for .079", or #9733 for .095" ... [3] 1443 Type Specifications Sheet (120-0658), if non-standard segments are involved. See "Substitute Characters" in "Type Catalog" for charges that apply.

SELECTIVE CHARACTER SET (#6402). #6402 for mdl N1 ... standard on mdls 3 and 4. Required if any type bar other than the standard 52-character bar is to be used. Provides controls which permit the 1443 to use all available character sets. When ordered for plant installation, the 63-character set may be specified at no charge in lieu of the standard 52-character set for use with this feature. See "Type Catalog" for characters in each set. The various character sets print at the following speeds:

Character Set	Mdl 3	---- LPM ----	
		Mdl 4	Mdl N1
13	385	565	600
39	175	285	300
52	140	230	240
63	110	190	200

--- FTP/ ---

Special Feature Prices:	MAC/	MLC	MLC	Purchase	MMMC	FIC
	MRC	1 yr*	2 yr			

Character Sets ... see "Type Catalog," pg 42 for mdls 3 and 4 ... pg 81.1 for mdl N1

Isolation, Control Unit #4700	NC	NC	NC	NC	NC	NC	
Print Positions, 24 add'l for mdl N1	5558	\$ 48	\$ 44	\$ 40	\$ 2,290	\$ 3.00	\$ 189
Selective Character Set for mdl N1	6402	26	24	22	1,265	3.00	26

* FTP is 12-23 months.
†† No longer available.



DP Machines

M 1445
May 79

1445 PRINTER -- Model N1

42-character set (alphanumeric) -- 240 lpm.
56-character set (alphanumeric with E13B symbols) -- 190 lpm.

Purpose: Conventional or MICR printed output for a S/360 mdl 25 or 30.

Highlights: Has 113 print positions. With standard alphanumeric 56-character set, which includes fourteen E13B symbols, rated speed is 190 lpm. Rated speed can be increased to 240 lpm with a 42-character alphanumeric set, or 525 lpm with a 14-character numeric set ... see Character Set and Selective Character Set under "Special Features." Actual speed depends upon the operation. The system's processing unit performs all analysis and format control. A line of printing is presented to the 1445 in the arrangement in which it is to be printed.

NOTE: The fourteen E13B symbols are furnished only in the standard 56-character set.

Depending upon the character set used, each print position can print any one of 56 characters ... alphabetic, numeric, six special characters, and the fourteen E13B symbols. Characters are spaced 8/inch. Line spacing is 6 or 8 lines/inch under operator control. Marginally punched continuous paper forms from 4" to 16-3/4" in overall width are fed by an automatic carriage. Maximum forms depth is 22" at 6 lines/inch ... 16-1/2" at 8 lines/inch. Forms spacing and skipping are controlled by a 12-channel tape in the carriage. Skipping is approximately 15" a second. When using the E13B symbols, it is recommended that 24# paper (safety paper, if required by the customer) with a MICR finish, or equivalent, be used ... see TNL N24-0342 for 1445 MICR Print Quality Considerations.

Two separate ribbon feeds -- one controls a MICR ribbon, the other a conventional ribbon. Only one ribbon feed can be used on the machine at a time. They can be mounted by the operator, depending upon printing requirements.

PREREQUISITE: For S/360 -- a control unit position on a system channel.

S/360 mdl 25 -- special feature on 2025; Multiplexer Channel, or Selector Channel ... see 2025.

S/360 mdl 30 -- multiplexer channel (standard), or Selector Channel (special feature) ... see 2030.

Bibliography: GC20-0360

"Voltage" and "Color" can be changed in the field.

Specify: [1] Voltage (must be consistent with system voltage): For mdl N1 (AC, 1-phase, 3-wire, 60 Hz) -- #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Type Size: #9733 for .095" ... all characters except E13B symbols.

[4] 56-character Set: #9570.

[5] Order Tape Punch, part no. 120910, the 1445 is for a New Name Account ... one per installation is furnished at no charge.

[6] Isolation, Control Unit (mdl N1 only): May be required on units shipped prior to December 29, 1967 ... see "Special Features."

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	1445 N1	\$ 1,540	\$67,570	\$179

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Metering: I/O Unit (Online) Maintenance: C
Purchase Option: 45% Warranty: B Per Call: 3

SPECIAL FEATURES

CHARACTER SETS (#1898, 1899, 1906). See "Type Catalog," page 91.1 for graphics and ordering instructions. **Prerequisite:** For #1898 or #1899, Selective Character Set (#6402) is required.

ISOLATION, CONTROL UNIT (#4700). [Mdl N1 only ... field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 1445 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are EC level requirements,

SELECTIVE CHARACTER SET (#6402). #6402 for mdl N1. Required if any type bar other than the standard 56-character bar is used. Provides controls which permit the 1445 to use all available character sets. See "Type Catalog," page 91.1, for characters in each set. The various character sets print at the following speeds:

14-character set (numeric) -- 525 lpm.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Character Sets -- see "Type Catalog," page 91.1				
Isolation, Control Unit #4700	NC	NC	NC	NC
Selective Character Set for mdl N1	6402 \$ 28	\$1,495	\$2.50	\$ 26

**2152 PRINTER-KEYBOARD**

For description and use with S/360 mdl 20, see GSD. manual.

2250 DISPLAY UNIT - Models 1, 2, 3

Purpose: A cathode ray tube unit for displaying output in alphanumeric and graphic form from a S/360 mdl 22, 30 thru 85 and 195, any S/370 Processor or any 4300 Processor. Input features provide broad man-machine communication ability.

- Model 1** Includes its own control unit ... used for a single display unit configuration.
- Model 2** [No longer available] Requires a 2840 Display Control mdl 1 ... applicable special features listed below can be ordered for field installation on installed units.
- Model 3** Requires a 2840 Display Control mdl 2 ... used in multiple display unit configurations for computer-aided design and scientific analysis applications. Up to four 2250 mdl 3s can be attached to each 2840 mdl 2. Each 2250 mdl 3 can be located 2,000 cable feet from the 2840 mdl 2.

Model Changes: Cannot be made in the field.

Highlights: An I/O unit offering both pictorial (line drawing) and alphanumeric input and output for analysis, design and file maintenance applications. It features:

- Large Display Area -- images are drawn anywhere within a 12" x 12" area on the face of the display tube.
- Large Capacity Display -- up to 3,848 character positions ... 52 lines with 74 characters to the line.
- Vector Graphics -- straight lines of any length, at any angular orientation and at any position on the screen. **Note:** For this function, Absolute Vectors and Control (#1002) is required on a model 1, or Absolute Vectors (#1001) on a model 2.
- Dynamic Display -- buffer areas are addressable ... individual characters or lines can be changed rapidly without time-consuming re-write of complete buffer area.
- Additional Data Modes -- incremental vectors permit improved buffer utilization and programming flexibility. **Note:** This function is standard on a model 3 ... on model 1, Graphic Design Feature (#4485) is required.
- Format Flexibility -- characters, point plots, and vector end points can be positioned in any combination at any of the 1,048,576 program addressable positions on the 1,024 x 1,024 grid.
- Large Capacity Display (model 3 only) -- up to 2,100 characters or 2,800 incremental vectors may be displayed at 40 cps regeneration rate without noticeable flicker ... up to 2,800 characters or 3,700 incremental vectors at 30 cps regeneration rate with commonly accepted flicker. **Note:** Vector and character times vary depending upon cable length.
- Fast Turnaround (model 3 only) -- a complete buffer (32K) can be rewritten in less than a tenth of a second ... manual inputs are presented to the CPU as fast as they are presented to display unit.
- Graphic Input -- program controllable light pen provides for a variety of input techniques, including pen search and tracking. **Note:** For this function, Graphic Design Feature (#4485) is required on model 1.
- Light Pen Detection Processing (model 3 only) -- extensive order set reduces CPU attention handling requirements ... see 2840 mdl 2.
- Application Flexibility -- optional alphanumeric and programmed function keyboards for operator input ... see "Special Features."

Prerequisites:

For either model -- in any S/360, S/370 or 4300 Processor, a minimum of 64K of storage is required for use of graphic support under OS/360. A minimum of 16K is required for diagnostic support only.

For Model 1 -- a Buffer (#1498 or 1499) on the 2250 mdl 1 itself. See "Special Features." A control unit position on a system channel.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel,

Add'l High Speed Multiplexer Channels ... see 2044.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 65, 67, 75 -- selector channel of 2860, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 85, 195, or S/370 mdl 165, 168, 195 -- selector channel of 2860, Selector Subchannel (special feature) on 2870, or the shared subchannel of a 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125. **Note:** No DOS support.

S/370 mdl 135, 135-3, 138 -- multiplexer channel (standard) ... see 3135, 3135-3, 3138.

S/370 mdl 145, 145-3, 148 -- multiplexer channel (standard), selector channels ... see 3145, 3145-3, 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158 and 3158-3.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.

For Model 3 -- a 2840 Display Control mdl 2.

Bibliography: S/360 --GC20-0360, S/370 -- GC20-0001

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 cycle): #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Buffer (mdl 1 only): Buffer (#1498 or 1499) is required ... see "Special Features."

[4] Isolation, Control Unit (mdl 1 only): May be required on units shipped prior to December 29,1967 ... see "Special Features."

PRICES:	mdl	MAC/ MRC	Purchase	MMMC
	2250	1	\$1,185	\$57,530
		3	1,740	34,830
				\$198
				223

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Maintenance: A Per Call: 3 Warranty: B

Purchase Option: 40%

SPECIAL FEATURES

ABSOLUTE VECTORS (#1001). [Model 2 only] Provides the ability to "draw" a continuous straight line between any two points of the 1,024 x 1,024 reference grid. **Prerequisite:** Absolute Vectors and Control (#1003) on the 2840 mdl 1.

ABSOLUTE VECTORS AND CONTROL (#1002). [Model 1 only] Provides controls and ability to "draw" a continuous straight line between any two points of the 1,024 x 1,024 reference grid.

ALPHAMERIC KEYBOARD (#1245). [Any model] A keyboard similar to that on a 1052 Printer-keyboard ... for alphanumeric data entry.

BUFFER (#1498, 1499). [Model 1 only] #1498 -- 4,096 bytes of core storage for display regeneration. #1499 -- 8,192 bytes. **Maximum:** One, #1498 or #1499. **Note:** One of these features is required on each 2250 mdl 1 ... if #1498 is installed, it must be removed to install #1499.

CHARACTER GENERATOR (#1880). [Model 1 only] A digital decoder which speeds character generation and conserves buffer space. Special circuits draw characters from stored EBCDIC codes rather than from sequences of programmed vectors. **Note:** This feature is required when using a 2250 mdl 1 as an operator's console under DIDOCS programming support.

GRAPHIC DESIGN (#4485). [Model 1 only] Provides two additional data modes ... 2-byte increment vectors and point plotting, four light pen control orders to enable CPU program-directed pen tracking, and a fiber optic light pen with a tip switch. **Limitation:** Cannot be installed with Light Pen (#4785). **Prerequisite:** Absolute Vectors and Control (#1002). **Note:** CPU interaction for light pen tracking will generally be great enough to limit such interaction to one 2250 mdl 1 at a time.

ISOLATION, CONTROL UNIT (#4700). [Model 1 only ... for field



2250 Display Unit (cont'd)

installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2250 mdl 1 without generating spurious signals. Thus a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements,

LIGHT PEN (#4785). [Model 1 or 2 only] A hand-held electronic pointer, activated by a foot switch, that allows program detection of lines, characters, and symbols that are displayed on the face of the tube. **Limitation:** On mdl 1, cannot be installed with Graphic Design (#4485). **Note:** A fiber optic light pen with a tip switch is provided with Graphic Design (#4485) on a mdl 1 and with the basic 2250 mdl 3.

OPERATOR CONTROL PANEL, FIRST (#5475). [Model 1 only] Provides a duplicate of the on/off and program load facilities (OCP) of a processing unit ... mounted on the 2250 mdl 1. For a remote panel of a 2050, 2065, 2075, 2085, 3165, 3168, 3168-3 or 3195. **Maximum:** One. **Specify:** #9175 if #5475 is to be installed on a 2085, 3165, 3168, 3168-3 or 3195 equipped with Extended Channels ... see "Special Features" under those units. **Prerequisites:** Remote Operator Control Panel Attachment (#9560) on the 2050, 2065, 2085 or 3195 ... see "Specify" under those units.

OPERATOR CONTROL PANEL, SECOND (#5476). [Model 1 only] Provides a duplicate of the on/off and program load facilities (OCP) of a second processing unit ... mounted on the 2250 mdl 1. For a remote panel of a 2050, 2065, 2075, 2085, 3165, 3168, 3168-3 or 3195. **Maximum:** One. **Specify:** #9176 if #5476 is to be installed on a 2250 attached to a 2085, 3165, 3168, 3168-3 or 3195 equipped with Extended Channels ... see "Special Features" under those units. **Prerequisites:** #5476 requires Operator Control Panel, 1st (#5875) ... Remote Operator Control Panel Attachment (#9560) on 2050, 2065, 2085 or 3195 ... see "Specify" under those units.

PROGRAMMED FUNCTION KEYBOARD (#5855), [Any model] A 32-key keyboard that allows the operator to indicate program interpretive functions to the system by a single key depression.

Special Feature Prices:	MAC/ MRC Purchase MMMC FIC				
	On Model 1, 2 or 3				
Alphanumeric Keyboard	#1245	\$81	\$3,910	\$4.50	\$306
Programmed Fctn Kybd	5855	162	7,840	9.50	318
On Model 1 only					
Absolute Vectors & Cntrl	1002	437	17,410	13.00	388
Buffer - 4,096	1498	381	18,290	8.50	179
Buffer - 8,192	1499	544	26,110	12.00	179
Character Generator	1880	409	19,610	18.50	275
Graphic Design	4485	353	16,960	16.00	1,030
Isolation, Control Unit	4700	NC	NC	NC	NC
Operator Control Panel					
First	5475	48	2,170	NC	231
Second	5476	37	1,680	NC	115
On Model 1 or 2 only					
Light Pen	4785	108	5,220	13.00	161
On Model 2 only					
Absolute Vectors	1001	381	15,210	12.00	509

2305 FIXED HEAD STORAGE

Purpose: High performance direct access storage for a S/360 mdl 85 or 195, or a S/370 mdl 145, 145-3, 148, 155, 158, 165, 168, 195, a 3031, 3032 or 3033 Processor, or a 4300 Processor.

Model 1 Up to 5.4 million bytes can be stored in the 384 addressable tracks ... each track has a maximum data capacity of 14,136 bytes.

Model 2 Up to 11.2 million bytes can be stored in the 768 addressable tracks ... each track has a maximum data capacity of 14,660 bytes.

Model Changes: Available at time of manufacture only.

Highlights: Features a high data rate and low access time ... designed for applications such as processor storage extension, programming system residence, and table or index storage. Data set organization is under program control, allowing data and key

lengths to be variable on an individual record basis. Thus, it provides efficient capacity utilization and record addressing flexibility.

Model 1 -- data is transferred two bits at a time between the 2305 mdl 1 and its 2835 Storage Control mdl 1 ... the 2835 then transfers data to the channel at a rate of 3.0 million 8-bit bytes per second. Any record location on the module can be accessed in an average of 2.5 milliseconds or within a maximum of 5.1 milliseconds.

Model 2 -- data is transferred one bit at a time between the 2305 mdl 2 and its 2385 Storage Control mdl 2 ... the 2385 then transfers data to the channel at a rate of 1.5 million 8-bit bytes per second. Any record location on the module can be accessed in an average of 5.0 milliseconds or within a maximum of 10.2 milliseconds.

Prerequisites: For Model 1 -- up to two 2305 mdl 1s can be attached to a 2835 Storage Control mdl 1 ... For Model 2 -- up to two 2305 mdl 2s can be attached to a 2835 Storage Control mdl 2. Word Buffer (#8810) is required on a 3145.

The 2305 is designed for interconnected operation as part of a 2305/2385 facility. Customers who wish to order a 2305 for stand-alone or individual use should submit an RPQ to provide the necessary safety elements (covers, cable connectors, etc.) to complete the unit for a non-standard (i.e., not interconnected with a 2835) environment. In lieu of the RPQ, the customer may provide safety elements equivalent to the standard 2305/2835 configuration or that provided by the above RPQ. If not provided the unit will be offered on a purchase only basis. See item [2] under "Specify."

Agreement for IBM to install and maintain the 2305 in any non-standard environment must be reviewed

Limitation: The 2305 mdl 1 cannot be attached to a S/370 mdl 145, 145-3, 148, 155, 158, 3031 or 4300 Processor.

Bibliography: S/360 -- GC20-0360 S/370 -- GC20-0001

Specify: [1] Voltage (AC, 3-phase, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Non-standard Environment: #9485 ... must be specified if the 2305 is not to be installed as part of a 2305/2835 combination. When ordering #9485, do not specify item [3] or [4] below.

[3] Initial Machine Order: If only one 2305 is being ordered, specify #9430 ... if two 2305s are being ordered for concurrent installation, specify #9431 for first one and #9432 for second one (separate orders are required) ... if one 2305 is on order and a second one is desired for concurrent installation, Alteration IAC is required for on-order 2305 (delete #9430 and add #9431) and order for second 2305 must specify #9432. For field installation of second module, see item [4] below.

[4] (a) If the 2305 is being ordered for shipment from the plant of control, specify #9433 and submit specifying #9431 and deleting #9430 against the serial number of the existing (first) 2305 on the customer's facility ... refer to 2835 for additional instructions.

(b) To field convert a 2305 from the first position to the second position, order RPQ and submit per (a) above, to change position of the existing (first) 2305 on the customer's facility ... refer to 2835 for additional instructions.

Mdl	MAC/ MRC	-- FTP / --		Purchase	MMMC	
		MLC 1 Yr*	MLC 2 Yr			
2305	1	\$5,495	\$5,055	\$4,616	\$125,350	\$480
	2	4,375	4,025	3,675	99,540	457

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Assignable Unit Maintenance: A
Per Call: 3 Purchase Option: 45% Warranty: B
Useful Life Category: 1 Upper Limit Percent: 0%
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 10%

* FTP is 12-23 months.

2314 DIRECT ACCESS STORAGE FACILITY - MDL 1
[No longer available]

Purpose: Large capacity high speed direct access storage and control for a S/360 mdl 30, 40, 50, 65, 75, 85, 195, or any S/370 Processor except 3115 or 3125.

Highlights: Has eight independent modules, each storing up to 29.17 million 8-bit bytes or 58.35 million packed decimal digits in a 2316 Disk Pack.

The eight removable and interchangeable 2316s provide a total of 233.4 million bytes of online storage and virtually unlimited offline storage. Minimum access is 25 milliseconds; average is 75 milliseconds; maximum is 135 milliseconds. Standard features include: **File Scan** -- for performing a comparison on selected bytes of file organization. **Record Overflow** -- for greater utilization of storage. Enhanced system reliability and performance is achieved by provision of a ninth "spare" module for customer use should one of the eight normally addressed modules become inoperable.

Cylinder Concept -- retained in the 2314. One cylinder has 20 tracks. Up to 7,294 bytes (or 14,588 packed decimal digits) on each track, provide 145,880 bytes (or 291,760 packed decimal digits) per cylinder, available under each of the eight access mechanisms.

Data transmission is at a rate of 312,000 bytes/second ... with packed decimal, the rate is 624,000 digits/second.

An advanced method of utilizing disk storage. Self-formatting tracks allow variable length identifiers and records to be easily handled. Command chaining -- multiple records within a cylinder can be read/written by a sequence of channel commands without rotational delays between records ... permits index and directory searches without processor intervention. The command structure is optimized to yield efficient random or sequential processing with either randomly or sequentially organized data files. The ability to protect "logical" files is provided by the combination of commands in the 2314 and checks within the control programs servicing the file system. Cyclic code and bit count checking is used to assure the integrity of stored data. The controls necessary to attach the unit to a system channel are included in the 2314.

Prerequisites: A control unit position on a system channel.

S/360 mdl 30, 40, 50 -- a special feature, Selector Channel ... see 2030, 2040, 2050.

S/360 mdl 65, 75 -- a selector channel of 2860 ... see 2860.

S/360 mdl 85, 195 or S/370 mdl 165, 168, 195 -- a selector channel of 2860, or a shared subchannel of a 2880 ... see 2860, 2880.

S/370 mdl 135 -- Selector Channel (special feature) ... see 3135.

S/370 mdl 135-3 -- Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- selector channel (standard) ... see 3145.

S/370 mdl 145-3 -- block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- block multiplexer channel ... see 3155, 3158.

3031 or 3032 Processor -- block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- block multiplexer channels (ten are standard) ... see 3033.

Each disk storage module requires a 2316 Disk Pack ... these must be ordered separately

Limitations:

S/360 mdl 30 -- the 2314 requires a 1.5-microsecond 2030 and can be attached only to the first selector channel. Further, when the 2314 is attached, the second selector channel is restricted as to devices that may be attached ... see "Channel Control Capabilities" under 2030. When a 2841 Control Unit and a 2314 are both attached to a 2030, both must be attached to the first selector channel. Because of the high data rate of the 2314 and the cycle stealing concept of the selector channel, available program processing time is reduced during 2314 operations. This is of particular concern when handling time dependent I/O devices, i.e., 1412, 1418, 1419, 1428. To determine the 2314 loading effect, refer to SRL GA24-3411, "S/360 Model 30 Channel Characteristics and Functional Evaluations."

S/360 mdl 40 -- the 2314 may be attached to either the first or second selector channel. However, 2314s may not be attached to both selector channels.

S/360 mdl 50 -- if the 2314 is to be used with a 2050 having 1410/7010 Compatibility (#4478), consult

Bibliography: S/360 -- GC20-0360 S/370 -- GC20-0001

Specify: [1] Each 2314 DASF mdl 1 is to be specified on AAS as follows: a) One 2314 mdl 001, b) One 2312 mdl 001, and c) Two 2313 mdl 001s ... on one of the 2313s also specify #9140 (to indicate the 2313 at the end of the 2314 DASF).

Note: The 2312 and 2313 type numbers and their associated feature codes are to be specified at no charge and are to be used only for internal IBM ordering and control purposes. List each type and model (2314, 2312, 2313) separately with all its associated feature codes. The 2312 and 2313 type numbers should never appear on any agreement.

[2] Voltage (AC, 3-phase, 60 Hz): Specify the same code for the 2314, the 2312 and each 2313 ... #9903 for 208 V, or #9905 for 230 V.

[3] Color: For 2314 only ... #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[4] Additional Codes: On the 2312 and 2313s additional codes are required depending upon special features on the 2314 and 2844 Auxiliary Storage Control ... see "Special Features" below.

[5] 2316 Disk Packs: 2316s are required and must be ordered separately ... see 2316.

[6] Isolation Feature: May be required on units shipped prior to December 29, 1967 ... see "Special Features."

--FTP--

PRICES:	Mdl	MAC/ MRC	MLC 1 Yr*	MLC 2 Yr Purchase	MMMM
	2314	1	\$5,890	\$5,419	\$4,948 \$199,450 \$856

Plan Offering: Plan A, Additional Use Charge Rate: 30% of 10%
Maintenance: C Per Call: 3 Warranty: B
Purchase Option: 55% Upper Limit Percent: 0%
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Model/Feature Additional Charge in lieu of AU: 10%

SPECIAL FEATURES

The following special features are on an "as available" basis for field installation.

ISOLATION, CONTROL UNIT (#4700). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2314 without generating spurious signals. Thus, if the 2314 can be logically disconnected from the system, the CPU program can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements,

REMOTE SWITCH ATTACHMENT (#6148). To attach the Two Channel Switch (#8170) to a 2167 Configuration Control Unit in a S/360 mdl 67-2, or to a S/360 mdl 65 MP which has the Configuration Control Panel (#1505) installed, or to a S/370 mdl 158 MP or 168 MP. **Prerequisite:** Specify #9500 on the 2312 ... #9500 can be field installed.

2844 ATTACHMENT (#7949). To attach a 2844 Auxiliary Storage Control. **Note:** Order this feature only when a 2844 is to be attached. Installation of the feature without concurrent installation of the 2844 renders the 2314 inoperative. **Maximum:** One. **Prerequisites:** Specify #9750 on the 2312 and each 2313 ... if the 2844 has a Two Channel Switch (#8171), also specify #9765 on the 2312 ... if the 2844 has a Remote Switch Attachment (#6150) also specify #9510 on the 2312. #9750, 9765 and 9510 can be field installed.

TWO CHANNEL SWITCH (#8170). To attach the 2314 to a second channel. Switching is under program control. Includes partitioning. **Prerequisites:** Specify #9760 on the 2312 ... #9760 can be field installed. If the two channel switch is routed through the Configuration Control Panel (#1505) of a multiprocessing S/360 mdl 65, Remote Switch Attachment (#6148) is required. Also in a S/360 mdl 67-2, a S/370 mdl 158 MP or 168 MP, #6148 is required. See #6148 above.

* FTP is 12-23 months.



2314 Direct Access Storage Facility - Mdl 1 (cont'd)

		-- FTP/ --		MAC/MLC MLC			
		MRC	1 Yr*	2 Yr	Purchase	MMMM	FIC
Isolation, Control Unit	#4700	NC	NC	NC	NC	NC	NC
Remote Switch Attach	6148	NC	NC	NC	NC	NC	NC
2844 Attachment	7949	NC	NC	NC	NC	NC	NC
Two Channel Switch	8170	\$156	\$144	\$131	\$5,340	\$3.50	\$767

2315 DISK CARTRIDGE

Purpose: High-speed removable disk storage unit for a drive in an 1810 or 2310 Disk Storage, the drive in an 1131 Central Processing Unit mdl 2, 3 or 4 or the standard single disk storage drive or Second Single Disk Storage Drive (#6415) of a 2044 Processing Unit.

The 2315 is marketed by IRD ...

2316 DISK PACK

Purpose: High-speed, removable, interchangeable disk storage unit for the 2314 DASF, the 2319 Disk Storage, or the 5445 Disk Storage Drive.

The 2316 is marketed by IRD

* FTP is 12-23 months.

2401 MAGNETIC TAPE UNIT

Purpose: Magnetic tape unit for S/360 mdls 22 thru 85 and 195, any S/370 Processor (except 3115 or 3125), any 4300 Processor, or an 1800 system.

For use with a 360 mdl 20, see GSD Manual.

Models: Operate at the following 8-bit bytes per second data rates:

Model 1	30,000 at 800 bpi
Model 2	60,000 at 800 bpi
Model 3	90,000 at 800 bpi
Model 4	60,000 at 1600 bpi
Model 5	120,000 at 1600 bpi
Model 6	180,000 at 1600 bpi
Model 8	Operates only in the seven-track format at 200, 556, or 800 bpi with data rates of 15, 41.7, or 60 KB.

Model Changes: Model 2 can be field changed to model 3 ... model 5 to model 6 ... no other changes are possible.

Systems:

S/360 mdl 25 -- only models 1, 2, 4 or 8 attached via 2803 Tape Controls can be used ... they must be attached to the selector channel.

S/360 mdls 22, 30 thru 85 and 195, any S/370 Processor (except 3115 or 3125), or any 4300 Processor -- all models can be attached except model 6 on the S/360 mdl 22 ... in a S/360 mdl 44, mdl 6s cannot be attached to the Multiplexer Channel (#5248).

1800 -- only mdls 1, 2 and 3 can be attached.

Highlights: Single tape unit which reads or writes the following half-inch magnetic tapes: IBM Heavy Duty, IBM Dynexcel, IBM Series 500, or competitive formulations which meet the specifications described in SRL GA32-0006. IBM Mylar† is suitable for use at 200, 556 or 800 bpi, but it should not be used at 1600 bpi.

On models 1, 2 and 3, a 9-Track Read/Write Head (#9558) or a 7-Track Read/Write Head (#9557) may be specified. See "Specify" below. On models 4, 5 and 6, use of Dual Density 800-1600 BPI (#3471) permits operation at 800 bpi density as well as at 1600 bpi. See "Special Features."

Nine Track Operation -- in 9-track format, data is recorded parallel by bit, serial by byte, in 9 tracks across the width of the tape ... tape data format uses eight of the nine bits for data, the ninth bit serving as a parity bit. The eight data bits can represent an alphanumeric or special character, two digits, a signed digit, or eight binary bits. For this operation on a mdl 1, 2 or 3, #9558 is required ... see "Specify" below.

Seven Track Operation -- on mdls 1, 2, 3 or 8 only ... tape is written in 7-track format compatible with tape written by 727/729/7330/7335/7701/7702/7765 tape units and by 2401/2415s (or 2402s), or 3420s equipped with 7-track Read/Write Heads. For this operation, #9557 is required, except on 2401 mdl 8. See "Specify." Seven Track compatibility (#7125, 7126, 7127) or Seven and Nine Track (800 BPI NRZI Compatibility (#7135, 7136) is also required on the 2803/2804 (or 2403/2404) tape control unit, except on 2803/2804 mdl 3s. See "Special Features" under those units.

Checking -- read-back-check-while-write on all models ... vertical parity recording on models 4, 5 and 6 ... vertical, longitudinal and diagonal parity recording on models 1, 2, 3 and 8.

Error Correction -- automatic in-flight single track error correction is provided for 1600 bpi 9-track format ... automatic single track error correction for 800 bpi 9-track format during the reread of a record containing one or more errors confined to a single track ... all other errors are detected and conventional error recovery routines apply.

Read Backwards -- all tapes (9 or 7-track) written on a 2401/2402/2403/2404/2415/2420 (9-track 1600 BPI PE only)/3420 can be read by any 2401/2402/2403/2404/2415/2420 (9-track 1600 B I PE only)/3420 in a forward or backward direction ... Data Conversion (#3228,3236) cannot be used on the tape control unit when reading 7-track tape backwards ... tape written by 727/729/7330/7335/7701/7702/7765s cannot be read backwards.

Power Window -- on machines shipped after April 1, 1966, a powered access window, raised or lowered under push-button control and always lowered upon completion of the program-initiated rewind unload command, is standard ... for units shipped prior to April 1, 1966, see Power Window (#5519) under "Special Features."

† Mylar is a trademark of E. I. Dupont de Nemours & Co., Inc. "IBM Mylar" is a brand of magnetic tape which includes a Mylar polyester substrate and which was previously marketed by IBM.

Quick Release Latch -- facilitates mounting and removal of tape reels.

Characteristics:

800 BPI	Mdl 1	Mdl 2	Mdl 3
Bytes/second	30,000	60,000	90,000
Density (bytes/inch)	800	800	800
Tape Speed (inches/sec)	37.5	75.0	112.5
Nominal Interrecord Gap	.6	.6	.6
Nominal IRG (milliseconds)	16.0	8.00	5.3
Rewind Time (inclgd reload)	3.0	1.4	1.0
Rewind & Unload (minutes)	2.2	1.5	1.1

Mdl 8			
Bytes/second	15,000/41,700/60,000		
Density (bytes/inch)	200/556/800		
Tape Speed (inches/sec)	75.0		
Nominal Interrecord Gap	.75		
Nominal IRG (milliseconds)	10.0		
Rewind Time (inclgd reload)	1.4		
Rewind & Unload (minutes)	1.5		

1600 BPI	Mdl 4	Mdl 5	Mdl 6
Bytes/second	60,000	120,000	180,000
Density (bytes/inch)	1,600	1,600	1,600
Tape Speed (inches/sec)	37.5	75.0	112.5
Nominal Interrecord Gap	.6	.6	.6
Nominal IRG (milliseconds)	16.0	8.0	5.3
Rewind Time (inclgd reload)	3.0	1.4	1.0
Rewind & Unload (minutes)	2.2	1.5	1.1

Prerequisites:
For S/360, S/370 or 4300 Processors

2401 mdls 1, 2, 3 -- a 2803 or 2804 Tape Control mdl 1 or 2 (or 2403 mdl 1, 2, 3, 4, 5, 6, or 2404 mdl 1, 2 or 3) ... with a 2803 or 2804 mdl 2 (or 2403 mdl 4, 5 or 6), Mode Compatibility (#5121) is required on each 2401 ... with a 2804 (or 2404), Simultaneous Read-while-write (#7160) is also required on each 2401. See "Special Features" below.

2401 mdls 4, 5 or 6 -- a 2803 or 2804 Tape Control mdl 2 (or 2403 mdl 4, 5 or 6) ... with a 2804, Simultaneous Read-while-Write (#7160) is also required. See "Special Features" below.

2401 mdl 8 -- requires a 2803 or 2804 Tape Control mdl 3 ... with a 2804 mdl 3, each tape unit attached must be equipped with Simultaneous Read-while-Write (#7160).

The 2803 (or 2403) requires a control unit position on a system channel ... the 2804 (or 2404) requires one control unit position on each of two system channels. For applicable channels, see 2803/2804.

For 1800

#3222 is required on the 1802 for one or two 2401 mdls 1, 2 or 3 (or one 2402 mdl 1, 2 or 3). See 1802.

Maximums:

S/360, S/370 or 4300 Processors -- any combination of 2401 (or 2402) mdls 1, 2 and 3 which does not exceed 8 tape drives can be attached to a 2803/2804 ... any combination of 2401 (or 2402) mdls 1, 2 or 3 which does not exceed seven tape drives can be attached to a 2403/2404 mdl 1, 2 or 3 ... any combination of 2401 (or 2402) mdls 1, 2 and 3, 4, 5 or 6 which does not exceed eight tape drives can be attached to a 2803/2804 mdl 2 ... any combination of 2401 (or 2402) mdls 1, 2, 3, 4, 5 or 6 which does not exceed seven tape drives can be attached to a 2403 mdl 4, 5 or 6. A maximum of eight 2401 mdl 8s can be attached to a 2803 mdl 3 or 2804 mdl 3.

1800 -- two 2401s, mdls 1, 2 and 3 in any combination, (or one 2402 mdl 1, 2 or 3) can be attached to an 1802.

Bibliography: S/360 -- GC20-0360 S/370 -- GC20-0001 1800 -- GA26-5921

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray,

[3] Read/Write Head: [for mdl 1, 2 or 3 only (800 bpi NRZI)] #9557 for 7-track, or #9558 for 9-track. **Prerequisite:** For #9557, Seven Track Compatibility or Seven and Nine Track Compatibility feature on the tape control ... see "Special Features" under 1802, (2403/2404), or 2803/2804. **Note:** #9557 can be changed in the field to #9558, or vice versa, at no charge to the rental customer. On purchased machines, the changes can be made on an RPO basis ... when ordering specify #9557 or #9558, machine type and model.



2401 Magnetic Tape Unit (cont'd)

[4] Tape reels: If any color other than gray is desired, specify #9051 for red, #9053 for blue, or #9054 for white.

[5] Use with 2804 (or 2404): Simultaneous-Read-while-Write (#7160) is required on each 2401 ... see "Special Features" below.

[6] Use with 2803/2804 mdl 2 (or 2403 mdl 4, 5 or 6): Mode Compatibility (#5121) is required on each 2401 mdl 1, 2 or 3 ... see "Special Features" below.

PRICES:	Mdl	---FTP---			Purchase	MMMC
		MAC/MRC	MLC 1Yr*	MLC 2 Yr		
2401	1	\$375	\$345	\$315	\$14,440	\$113
	2	544	500	457	20,940	128
	3	881	811	740	33,950	156
	4	432	397	363	16,530	136
	5	600	552	504	23,140	149
	6	937	862	787	36,150	180
	8	447	411	375	15,210	156

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Maintenance: C Per Call: 3 Warranty: B
 Purchase Option: 45% Metering: I/O Unit
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Model/Feature Additional Charge in lieu of AU Charge: 10%
 Upper Limit Percent: 0%

SPECIAL FEATURES

DUAL DENSITY - 1600 BPI (#3471). [2401 mdl 4, 5, 6 only] Permits these drives to operate at 800 bpi in addition to 1600 bpi. **Prerequisite:** Nine Track (800 BPI NRZI) Compatibility (#5320, 5321) or Seven and Nine Track Compatibility (#7135, 7136) on the 2803/2804 mdl 2 (or 2403 mdl 4, 5, 6) controlling the 2401.

MODE COMPATIBILITY (#5121). [2401 mdl 1, 2, 3 only] Required to attach these units to a 2803/2804 mdl 2 (or 2403 mdl 4, 5 or 6).

POWER WINDOW, (#5519). [For field installation on units shipped before April 1, 1966 ... all units shipped after April 1, 1966 are equipped with a power window as standard]. This feature may be ordered for field installation on units installed without the feature. **Specify:** Serial number of 2401.

SIMULTANEOUS READ-WHILE-WRITE (#7160). Required on any 2401 attached to a two-channel, simultaneous read-while-write tape control. 2401 mdls 1, 2, 3 or 8 require this feature when attached to a 2804 Tape Control mdl 1, 2 or 3 (or 2404 mdl 1, 2 or 3). 2401 mdls 4, 5 or 6 require it when attached to a 2804 mdl 2. **Limitation:** When equipped with this feature, 2401s will not operate with a 2803 (or 2403) control unit.

Special Feature Prices:	Mdl	---FTP---			Purchase	MMMC	FIC
		MAC/MRC	MLC 1 Yr*	MLC 2 Yr			
Dual Density 800-1600 BPI#3471	\$26	\$24	\$22	\$1,100	\$2.50	\$78	
Mode Compatibility	5121	10	9	8	426	NC	
Power Window	5519	308	SUC	-	308	NC	
Simultaneous Rd-w-Write	7160	10	9	8	426	NC	

**2402 MAGNETIC TAPE UNIT
2403 MAGNETIC TAPE UNIT AND CONTROL
2404 MAGNETIC TAPE UNIT AND CONTROL**

Note: These units have been withdrawn and new orders cannot be accepted ... the special features listed below are available for field installation.

2402 -- two independently operating drives in a single unit.
2403 -- a single channel, read or write tape control and one tape drive.

2404 -- a two channel, simultaneous read-while-write tape control and one tape drive.

Models: Models of all units denote the tape data rate in 8-bit bytes/second ... 2404s were available only in models 1, 2 and 3.

Model 1	30,000 at 800 bpi	Model 4	60,000 at 1600 bpi
Model 2	60,000 at 800 bpi	Model 5	120,000 at 1600 bpi
Model 3	90,000 at 800 bpi	Model 6	180,000 at 1600 bpi

Model Changes: **2402** -- a model 2 can be field converted to a model 3, or a model 5 to a model 6 ... **2403** -- a model 2 can be field converted to a model 3, or a model 5 to a model 6 ... **2404** -- a model 2 can be field converted to a model 3 ... no other changes are possible.

Limitations: In **1800** -- only a 2402 mdl 1, 2 or 3 can be used.

In **S/360 mdl 44** -- a 2402 mdl 6 or 2403 mdl 6 cannot be attached to a Multiplexer Channel (#5248).

Highlights: See "Highlights" under 2401.

Prerequisites: See "Prerequisites" under 2401.

Maximums: See "Maximums" under 2401.

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] **Read/Write Heads:** [For mdls 1, 2 or 3 only (800 bpi NRZI)] #9557 for 7-track, or #9558 for 9-track. **Prerequisite:** For #9557, Seven Track Compatibility or Seven and Nine Track Compatibility feature on the tape control ... see "Special Features" below or under 1802 or 2403 or 2404. **Note:** #9557 can be changed in the field to #9558, or vice versa, by MES for the rental customer. On purchased machines, the changes can be made on an RPO basis ... when ordering, specify #9557 or #9558, machine type and model.

[3] **Color:** #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[4] **Tape Reels:** If any color other than tan gray is desired, specify #9051 for red, #9053 for blue, or #9054 for white.

[5] Use with 2804 (or 2404): On 2402s, Simultaneous Read-while-Write (#7161) is required ... see "Special Features."

[6] Use with 2803/2804 mdl 2 (or 2403 Mdl 4,5 or 6): On 2403 mdls 1, 2 or 3, Mode Compatibility (#5122) is required see "Special Features."

[7] **Isolation, Control Unit:** May be required on 2403s or 2404s shipped prior to December 29, 1967 ... see "Special Features."

Prices:	Mdl	---FTP---			Purchase	MMMC
		MAC/MRC	MLC 1 Yr*	MLC 2 Yr		
2402	+1	\$696	\$640	\$585	\$26,670	\$221
	+2	1,030	948	865	39,790	253
	+3	1,705	1,569	1,432	65,800	313
	+4	808	743	679	30,970	268
	+5	1,140	1,049	958	44,090	297
	+6	1,815	1,670	1,525	70,110	359
2403	+1	\$998	\$918	\$838	\$38,910	\$133
	+2	1,165	1,072	979	45,740	147
	+3	1,495	1,375	1,256	58,970	174
	+4	1,210	1,113	1,016	47,830	162
	+5	1,375	1,265	1,155	54,670	178
	+6	1,715	1,578	1,441	67,900	190
2404	+1	\$1,305	—	—	\$60,290	\$157
	+2	1,475	—	—	68,220	173
	+3	1,815	—	—	83,890	203

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Maintenance: C Per Call: 3 Warranty: B
 Purchase Option: 45%
 Metering: 2402 -- I/O Unit (Online)
 2403/2404 -- Assignable Unit
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Model/Feature Additional Charge in lieu of AU Charge: 10%
 Upper Limit Percent: 0%

* FTP is 12-23 months.

† Orders for these machines will not be accepted ... orders for special features and RPOs for on-order or installed units will be accepted.



2402-2404

(cont'd)

SPECIAL FEATURES

The following features are on an "as available" basis for field installation.

DATA CONVERSION (#3228, 3236). Program controlled feature for processing data with maximum packing efficiency. On a write operation, three 8-bit bytes are written as four 6-bit tape characters ... on a read operation, four 6-bit tape characters are converted to three 8-bit bytes. #3228 -- on 2403 ... #3236 -- on 2404. **Limitation:** Cannot be used when reading 7-track tapes backward. **Prerequisite:** Seven Track Compatibility (#7125, 7126, 7127) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135).

DUAL DENSITY 800-1600 BPI (#3471, 3472). [2402/2403 mdl 4, 5, 6 only] Permits these drives to operate at 800 bpi as well as 16000 bpi. #3471 -- for 2403 mdl 4, 5 or 6 ... #3472 -- for 2402 mdl 4, 5 or 6. **Prerequisite:** For 2402 -- Nine Track (800 BPI NRZI) Compatibility (#5320, 5321) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135, 7136) on the controlling 2403 mdl 4, 5 or 6 or 2803/2804 mdl 2 ... for 2403 -- #5320 or #7135 on the 2403 itself.

ISOLATION, CONTROL UNIT (#4701-4704). [2403 or 2404 only ... for field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the tape control without generating spurious signals. Thus a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. #4701 -- for basic 2403 mdl 1, 2 or 3.

#4702 -- for a 2403 mdl 1, 2 or 3 with Two Channel Switch (#8100).

#4703 -- for a 2403 mdl 4, 5 or 6.

#4704 -- for a 2404 mdl 1, 2 or 3.

Prerequisites: in all cases there are compatible EC level requirements and technical limitations,

#4702 requires Two Channel Switch (#8100) on the 2403 mdl 1, 2 or 3.

MODE COMPATIBILITY (#5122). [2402 mdl 1, 2 or 3 only] Required to attach the 2402 mdl 1, 2 or 3 to a 2403 mdl 4, 5 or 6 or a 2804/2804 mdl 2.

NINE TRACK (800 BPI NRZI) COMPATIBILITY (#5320). [2403 mdl 4, 5 or 6 only] Required if any drive of an attached 2401/2402 mdl 1, 2 or 3 has a 9-track Read/Write Head (#9558), or if any attached 2402 mdl 4, 5 or 6 or the 2403 itself has Dual Density 800-1600 BPI (#3471, 3472) ... provides the ability to read and write 800 bpi, 9-track NRZI as well as 1600 bpi on such drives. **Limitation:** Cannot be installed with Seven Track Compatibility (#7127) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135).

POWER WINDOW (#5519). [Only for field installation on units shipped prior to April 1, 1966 ... power window(s) are standard on units shipped after that] If ordered, two #5519s are required for each 2402. **Specify:** Machine type and serial number.

REMOTE SWITCH ATTACHMENT (#6148). [2403 mdl 1, 2 or 3 only ... for use in a S/360 mdl 67 or a multiprocessing S/360 mdl 65 only] To attach the Two Channel Switch (#8100) to a 2167 Configuration Control or route it thru the Configuration Control Panel (#1505) of a multiprocessing S/360 mdl 65 system. **Prerequisites:** Two Channel Switch (#8100) and a 2167 or the #1505 of a multiprocessing S/360 mdl 65.

SEVEN TRACK COMPATIBILITY (#7125 - 7127). Required if any 2401 or 2402 mdl 1, 2 or 3 attached to the 2403 or 2404 has a 7-track Read/Write Head (#9557). Permits such drives to read or write in 7-track format compatible with tape generated by 727/729/7330/7335/7701/7702/7765 tape units and other 2401/2402/2403/2404 or 2415 tape drives equipped with 7-track Heads. #7125 -- for 2403 mdl 1, 2 or 3 ... #7126 -- for 2404 mdl 1, 2 or 3 ... #7127 -- for 2403 mdl 4, 5 or 6. **Limitation:** Cannot be installed with Nine Track (800 BPI NRZI) Compatibility (#5320) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135) on a 2403 mdl 4, 5 or 6. **Specify:** The number of tape drives associated with this feature that will be equipped with 7-track Read/Write Heads (#9557).

SEVEN AND NINE TRACK (800 BPI NRZI) COMPATIBILITY (#7135). [2403 mdl 4, 5 or 6 only] Satisfies the requirements of both the Seven Track Compatibility (#7127) and Nine Track (800 BPI NRZI) Compatibility (#5320) features ... permits reading and writing of both 7-track and 9-track 800 bpi NRZI tapes on suitably equipped tape drives attached to the 2403 mdl 4, 5 or 6. **Limitation:** Cannot be installed with Nine Track (800 BPI NRZI) Compatibility (#5320) or Seven Track Compatibility (#7127). **Specify:** The number of tape drives associated with this feature that will be equipped with 7-track Read/Write Heads (#9557). **Prerequisites:** 7-track Read/Write Head(s) on 2401/2402 mdls 1, 2 or 3 attached to this 2403 and/o Dual Density (#3471, 3472) on the 2403 or attached 2402(s).

SIMULTANEOUS READ-WHILE-WRITE (#7161). [2402 mdl 1, 2, 3, 4, 5, 6 only] Required on any 2402 attached to a two channel, simultaneous read-while-write tape control ... 2402 mdls 1, 2 or 3 require this feature when attached to a 2404 mdl 1, 2 or 3 or a 2804 mdl 1 or 2 ... 2402 mdls 4, 5 or 6 require it when attached to a 2404 mdl 2. **Limitation:** When equipped with this feature, 2402s will not operate with a 2403 or 2803 control unit.

SIXTEEN DRIVE ADDRESSING (#7185). [2403 mdl 1, 2, 3, 4, 5 or 6 only] Required where the pool of drives attached through 2318 Switching Units exceeds eight ... permits the 2403 to address up to sixteen tape drives ... see 2816.

TWO CHANNEL SWITCH (#8100). [2403 mdl 1, 2, 3 only ... for use in a S/360 mdl 67 or multiprocessing S/360 mdl 65 only] To attach the 2403 to a second channel ... switching is under program control ... includes partitioning.

Special Feature Prices:	---FTP---						
	MAC/ MRC	MLC 1 Yr*	MLC 2 Yr	Purchase	MMMC	FIC	
Data Conversion							
on 2403	#3228	\$49	\$45	\$41	\$1,935	\$1.50	\$88
on 2404	3236	77	---	---	3,610	2.00	179
Dual Density 800-1600 BPI							
on 2403 mdl 4,5,6	3471	26	24	22	1,100	2.50	78
on 2402 mdl 4,5,6	3472	54	50	45	2,145	4.50	157
Isolation Control Unit							
on basic 2403 mdl							
1,2,3	4701	NC	NC	NC	NC	NC	NC
on 2403 mdl 1,2,3							
with #8100	4702	NC	NC	NC	NC	NC	NC
on 2403 mdl 4,5,6	4703	NC	NC	NC	NC	NC	NC
on 2404 mdl 1,2,3	4704	NC	NC	NC	NC	NC	NC
Mode Compatibility	5122	21	19	18	864	NC	55
9 Track Compatibility	5320	256	236	215	9,925	47.00	946
Power Window	5519	308	SUC	---	---	NC	NC
Remote Switch Attach	6148	NC	NC	NC	NC	NC	NC
7 Track Compatibility							
on 2403 mdl 1,2,3	7125	54	50	45	2,145	2.00	131
on 2404 mdl 1,2,3	7126	84	---	---	3,855	3.00	179
on 2403 mdl 4,5,6	7127	195	179	164	7,545	31.00	869
7 & 9 Track Compatibility	7135	420	386	353	16,000	80.50	1,245
Simultaneous R-w-W	7161	21	19	18	864	NC	102
16 Drive Addressing	7185	26	24	22	1,100	1.50	66
Two Channel Switch	8100	110	101	92	3,765	5.50	††

†† To be announced.

* FTP is 12-23 months.

**2415 MAGNETIC TAPE UNIT AND CONTROL**

Purpose: Magnetic tape unit and control for a S/360 mdl 22, 25, 30, 40, 50, 65, 67 or 75 ... or a S/370 mdl 135, 135-3, 138, 145, 145-3, 148, 155, 158, or a 3031 Processor, or any 4300 Processor.

Note: For use with S/360 mdl 20, see GSD manual.

Models: Each model has one single-channel tape control and multiple independently operating tape drives.

15,000 bytes/sec. (800 bpi) 30,000 bytes/sec. (1600 bpi)*

Model 1 - 2 drives	Model 4 - 2 drives
Model 2 - 4 drives	Model 5 - 4 drives
Model 3 - 6 drives	Model 6 - 6 drives

* When equipped with an appropriate compatibility feature, drives on these models can operate at 15,000 bytes/second (800 bpi) ... see "Special Features."

Model Changes: A model 1, 2 or 3 can be field converted to another model within that group ... a model 4, 5 or 6 to another model in that group ... no other changes are possible. See item [1] under "Specify."

Highlights: Tape drives read and write the following half-inch magnetic tapes: IBM Heavy Duty, IBM Dynexcel, IBM Series 500, or competitive formulations which meet the specifications described in SRL GA32-0006. IBM Mylar** is suitable for use at 200, 556 or 800 bpi, but should not be used at 1600 bpi.

The standard drives read or write 9-track tapes. Special features permit reading and writing of 7-track tapes ... see "Special Features."

Nine Track Operation -- in 9-track format, data is recorded parallel by bit, serial by byte, in 9 tracks across the width of the tape ... tape data format uses 8 of the 9 bits for data, the 9th bit serving as a parity bit. The 8 data digits can represent an alphanumeric or special character, two digits, a signed digit, or 8 binary bits.

Seven Track Operation -- tape is written in 7-track format compatible with tape written with 727/729/7330/7335/7701/7702/7765 tape units and by 2401/2415 (or 2402/2403/ 2404) and 3420s equipped with 7-track Read/Write Heads. For this operation, a compatibility feature #7125, #7127 or #7135 is required ... see "Special Features."

Checking: Read-back-check-while-write on all drives vertical, longitudinal and diagonal parity recording on 800 bpi drives.

Error Correction: Automatic in-flight single track error correction is provided for 1600 bpi 9-track format ... all other errors are detected and conventional error recovery routines apply. The cyclic redundancy check character is recorded on 800 bpi 9-track format to maintain 2400 series compatibility ... drives are not capable of error correction during read operations ... all errors are detected and conventional error recovery routines apply.

Read Backward: All tapes (9 or 7-track) written on a 2401/2402/2403/2404/ 2415/2420 (9-track 1600 BPI PE only)/3420 can be read by any 2401/2402/2403/2404/2415/2420 (9-track 1600 BPI PE only)/3420 in a forward or backward direction ... Data Conversion (#3228) cannot be used when reading 7-track tape backwards ... tapes written by 727/729/7330/7701/7702/7765s cannot be read backward.

Quick Release Latches: Each drive has quick release latches to facilitate mounting and removing of tape reels.

Characteristics:

	Mdl 1, 2, 3	Mdl 4, 5, 6
Bytes/second	15,000	30,000/15,000
Density (bytes/inch)	800	1600/800
Tape Speed (inches/second)	18.75	18.75
Nominal Interrecord Gap (inches)	.6	.6
Nominal IRG Time (milliseconds)	32.00	32.00
Rewind Time, including reload (minutes)	4.0	4.0
Rewind and Unload (minutes)	4.0	4.0

Prerequisites:

For S/360 mdl 25 -- a control unit position on the Selector Channel (#6960) on the 2025 ... see 2025.

For S/360 mdl 22, 30, 40, 50 -- a control unit position on a multiplexer channel (standard), or Selector Channel (special feature, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

For S/360 mdl 65, 67, 75 -- a control unit position on a selec-

** Mylar is a trademark of E.I. Dupont de Nemours & Co., Inc. "IBM Mylar" is a brand of magnetic tape which includes a Mylar polyester substrate and which was previously marketed by IBM.

tor channel of a 2860, or Selector Subchannel (special feature) on a 2870 ... see 2860, 2870.

For S/370 mdl 135 -- multiplexer channel (standard), selector channel (special feature, or block multiplexer channel (special feature) ... see 3135. *not* supported on byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or a Selector Channel.

For S/370 mdl 135-3 -- byte multiplexer channel (standard), block multiplexer channels (special features) ... see 3135-3. *Not* supported by byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or block multiplexer channel.

For S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138. *Not* supported by byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or block multiplexer channel.

For S/370 mdl 145 -- multiplexer channel (standard), or selector channels ... see 3145.

For S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

For S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels ... see 3148.

For S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

3031 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031.

4331 Processor -- byte multiplexer channel (optional) ... see 4331 *byte multiplexer channel for restrictions ... block multiplexer channel (optional) ... see 4331.*

4341 Processor -- block multiplexer channels (two are standard) ... see 4341.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

SPECIFY: [1] All 2415 models are to be ordered as follows:

2415 Model

1
2
3
4
5

[2] Voltage (AC, 3-phase, 4-wire, 60 Hz): For 2415 only -- #9903 for 208 V, or #9905 for 230 V.

[3] Read/Write Heads: A 9-track head is furnished as standard for each of the two drives in each 2415 unless Seven Track Compatibility (#7125, #7127) or Seven and Nine Track Compatibility (#7135) is ordered for the 2415 and 7-track Read/Write Heads are specified as indicated under those features ... see "Special Features."

[4] Color: For 2415 listed in [1] above, specify one of the following -- #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. The same color must be specified for all units comprising the 2415.

[5] Empty Tape Reels: If other than the standard gray reels are desired, for 2415 listed in [1] above, specify two of the following in any combination -- #9051 for red, #9053 for blue, or #9054 for white.

[6] Isolation, Control Unit: May be required on units shipped prior to December 29, 1967 ... see "Special Features."



2415 Magnetic Tape Unit and Control (cont'd)

PRICES: Mdl		---FTP/---			Purchase	MMMC
		MAC/MRC	MLC 1 Yr†	MLC 2 Yr		
2415	1	\$841	\$774	\$706	\$32,950	\$187
	2	1,345	1,237	1,130	52,690	334
	3	1,845	1,697	1,550	72,420	486
	4	1,015	934	853	40,010	214
	5	1,630	1,500	1,369	64,260	382
	6	2,240	2,061	1,882	88,510	553

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Maintenance: C Per Call: 3 Warranty: B
 Metering: Assignable Unit Purchase Option: 45%
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Model/Feature Additional Charge in lieu of AU Charge: 10%
 Upper Limit Percent: 0%

SPECIAL FEATURES

DATA CONVERSION (#3228). Program-controlled feature for processing data with maximum packing efficiency. On a write operation, three 8-bit bytes are written as four 6-bit tape characters ... on a read operation, four 6-bit tape characters are converted to three 8-bit bytes. **Limitation:** Cannot be used when reading 7-track tapes backwards. **Note:** Specify on 2415
Prerequisite: Seven Track Compatibility (#7125 or #7127) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135).

ISOLATION, CONTROL UNIT (#4701, #4703). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2415 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. #4701 -- for a 2415 mdl 1, or 3 ... #4703 --- for a 2415 mdl 4, 5 or 6. **Note:** Specify on 2415 only. **Prerequisite:** in all cases there are compatible EC level requirements.

NINE TRACK (800 BPI NRZI) COMPATIBILITY (#5320). [Models 4, 5, 6 only] Required if any of the 2415 drives is to read or write 800 bpi 9-track NRZI in addition to 1600 bpi. **Limitation:** Cannot be installed with Seven Track Compatibility (#7127) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135). **Note:** Specify on 2415 only.

SEVEN TRACK COMPATIBILITY (#7125, 7127). Required if any of the 2415 drives is to read or write 7-track tape. **Note:** Each 2415 and 2416 has two drives. Permits them to read or write tape in 7-track format compatible with tape generated by 727/729/ 7330/7335/7701/7702/7765 tape drives and by 2401/2402/2403/2404/2415/3420 tape drives with 7-track Read/Write Heads. #7125 -- for mdl 1, 2 or 3 ... #7127 -- for mdl 4, 5 or 6. **Limitation:** Cannot be installed with Nine Track (800 BPI NRZI) Compatibility (#5320) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135). **Specify:** Depending on 2415 model, #7125 or #7127 for 2415 only ... do not specify on 2416(s) since only the unit containing control circuits is affected. Either or both drives in the 2415 may be equipped with a 7-track Read/Write Head ... from the following table, order only for the specific position(s) on each unit which is to read/write 7-track tape:

Type	Model	7-track Read/Write Heads	
		Left Drive (A)	Right Drive (B)
2415	1 or 4	#9680	#9681
2415	2 or 5	#9680	#9681
2415	3 or 6	#9680	#9681

Note: For any drive where a 7-track head is not specified, a 9-track head will be furnished.

In the field, a 7-track head can be replaced by a 9-track head, and vice versa, by for a rental customer. On purchased machines, the change will be made on an RPQ basis. must show specific 9XXX feature numbers (from above list) to designate which 7-track head is to be removed and which is to be installed. For example, on a 2415 model 2, the following are installed:

7-track Heads 9-track Heads
 2415 mdl 2 #9680 (left drive) Standard on right drive

It is desired to switch 7 and 9-track heads on the 2415
 Hence, the following MES is required:

On 2415 -- Remove #9680 and install #9681

† FTP is 12-23 months.

Removal of #9680 and #9683 in effect causes these drive positions to revert to standard 9-track heads and installation of #9681 and #9682 changes these other positions to 7-track heads. Parts (and instructions) supplied will enable all drives to function in the desired manner when installed.

SEVEN AND NINE TRACK (800 BPI NRZI) COMPATIBILITY (#7135). [Models 4, 5, 6 only] Satisfies the requirements of both Nine Track (800 BPI NRZI) Compatibility (#5320) and Seven Track Compatibility (#7127). Permits reading and writing of both 7 and 9-track 800 bpi NRZI tape. **Limitation:** Cannot be installed with #5320 or #7127. **Specify:** #7135 for 2415 only ... do not specify on 2416(s) since only the unit containing control circuits is affected. Either or both drives in the 2415 may be equipped with a 7-track Read/Write Head. From the following table order only for the specific position(s) on each unit which is to read/write 7-track tape:

Type	Model	7-track Read/Write Heads	
		Left Drive (A)	Right Drive (B)
2415	4	#9680	#9681
2415	5	#9680	#9681
2415	6	#9680	#9681

Note: For any drive where a 7-track head is not specified, a 9-track head will be furnished.

In the field, a 7-track head can be replaced by a 9-track head, and vice versa, by MES for a rental customer. On purchased machines, the charge will be made on an RPQ basis. must show specific 9XXX feature numbers (from above list) to designate which 7-track head is to be removed and which is to be installed. A typical example of such a change is described under Seven Track Compatibility (#7125, 7127) above.

Special Feature Prices:	---FTP/---						
	MAC/MRC	MLC 1 Yr†	MLC 2 Yr	Purchase	MMMC	FIC	
Data Conversion	#3228	\$49	\$45	\$41	\$1,935	\$1.50	\$88
Isolation, Control Unit							
for mdl 1,2,3	4701	NC	NC	NC	NC	NC	NC
for mdl 4,5,6	4703	NC	NC	NC	NC	NC	NC
9 Track Compatibility	5320	150	138	126	5,825	15.00	480
7 Track Compatibility							
for mdl 1,2,3	7125	54	50	45	2,145	2.00	527
for mdl 4,5,6	7127	105	97	88	4,085	4.50	527
7 & 9 Track Compatibility	7135	172	158	144	6,675	21.00	665



2420 MAGNETIC TAPE UNIT

Purpose: Magnetic tape unit for use with S/360, S/370 or 4300 Processors.

Model 5 160,000 bytes/second. For use with S/360 mdls 30, 40, 44, 50, 65, 67, 85, 91, 195, any S/370 Processor (except 3115 or 3125), or 4341 Processor.

Model 7 320,000 bytes/second. For use with S/360 mdls 50, 65, 67, 75, 85, 91, 195, any S/370 Processor (except 3115 or 3125), or any 4300 Processor.

Model Changes: Cannot be made in the field.

Highlights: Has one tape drive which reads or writes IBM Series/500, Dynexcel, or Heavy Duty half-inch magnetic tape on 10-1/2", 8-1/2" or Minireels. A completely new tape transport minimizes mechanical delay. Tape wear is minimized ... the only contact of the recording surface is the Read/Write Head and the tape cleaner. Minimum exposure to tape damage from operator handling. In-column rewind at approximately 500"/second for any amount of tape (last 100' rewinds at machine read/write speed).

Limitations: The following half-inch tapes can be used: IBM Heavy Duty, IBM Dynexcel, IBM Series 500, or competitive formulations which meet the specifications described in SRL GA32-0006. IBM Mylar and IBM Acetate tapes should not be used with 2420 tape units.

Automatic Threading -- threading is automatic with or without the new wraparound cartridge ... reduced set-up and tear-down time ... with the wraparound cartridge, tape is protected at all times.

Note: For shortened or stripped tape reel considerations, see SRL GA22-6918.

Recording Format -- 9-track phase encoded. Data is recorded parallel by bit, serial by byte, in 9 tracks across the width of the tape. Tape data format uses 8 of the 9 bits for data ... the 9th bit serving as a parity bit. The eight bits of one character can represent an alphabetic, numeric or special character, two digits, a signed digit, or eight binary bits. The recording format is compatible with the 1600 bpi phase encoded recording on drives of 2401/2402/2403/2415 mdls 4, 5 and 6.

Read Backwards -- all 1600 bpi tapes can be read in a forward or backward direction.

Checking -- when writing, vertical parity is recorded and each track is read and checked for parity ... when reading, each byte is parity checked. If a check occurs, an error condition is either signalled or corrected, depending upon monitored signal levels.

Error Correction -- automatic inflight single track error correction for tape defect errors (lack of recorded signal).

Power Window -- a standard feature ... operates electrically ... lowers automatically on rewind-unload command.

Quick Release Hatch -- facilitates mounting and removal of tape reel.

Characteristics	Model 1	Model 2
Bytes/second	160,000	320,000
Density (bytes/inch)	1,600	1,600
Tape Speed (inches/second)	100	200
Nominal Interblock Gap (inches)	0.6	0.6
Nominal IBG/IRG Time (milliseconds)	6.0	3.0
Rewind Time (minutes)	1.2	1.0
Rewind and Unload (minutes)	1.3	1.1
** Autothreading Operation (seconds)	10.0	7.0
Read/Write Access Time (milliseconds)	3.9/3.4	2.5

**From initiation (using mounted supply reel) to "tape drive ready."

Prerequisite: A 2803 Tape Control mdl 2, serial no. above 14,000 and below 30,000, equipped with a 2420 Model 5/7 Attachment (#7900). **Note:** Before ordering, see #7900 under "Special Features" for 2803.

Limitations: 2420 mdl 7s can be attached only to S/360 mdl 50, 65, 67, 75, 85, 91, 195, any S/370 Processor (except 3115 or 3125), or any 4300 Processor. 2420 mdl 5s can be attached only to S/360 mdls 30, 40, 44, 50, 65, 67, 75, 85, 91, 195, any S/370 Processor (except 3115 or 3125), or any 4300 Processor. On a S/360 mdl 30, diagnostic support requires a 2030 mdl D or larger.

2420 mdl 5s must be attached to a selector channel or Selector Subchannel (special feature) of 2870, or on a S/360 mdl 85, 195 or S/370 mdl 165, 195 to a shared subchannel of a 2880. On a S/370 mdl 155, 158, or a 3031, 3032 or 3033 Processor, only a block multiplexer channel may be used. On a S/370 mdl 135 only a Selector Channel (special feature) may be used. On a S/370 mdl 135-3 or 138 only a block multiplexer channel may be used. 2420 mdl 5s must be attached to the block multiplexer channel on 4331 (special feature) or 4341 Processors.

2420 mdl 7s must be attached to a selector channel, or on a S/360 mdl 85, 195 and S/370 mdl 165, 195 to a shared subchannel of a 2880. On a S/370 mdl 155, 158 or 3031, 3032 or 3033 Processor only a block multiplexer channel can be used. On a S/370 mdl 135, only a Selector Channel (special feature) with or without the block multiplexer channel may be used. On a S/370 mdl 135-3 or 138 only a block multiplexer channel may be used. 2420 mdl 7s must be attached to the block multiplexer channel on 4331 (special feature) or 4341 Processors.

Supplies: One standard 10-1/2" reel of magnetic tape enclosed in an Easyload Cartridge is supplied with the unit

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001.

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 208 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Tape Reels: If any color other than gray is desired, specify #9051 for red, #9053 for blue, or #9054 for white.

PRICES:	Mdl	-- FTP --			Purchase	MMMC
		MAC/MRC	MLC 1 Yr*	MLC 2 Yr		
2420	5	\$ 634	\$ 583	\$ 533	\$27,880	\$181
	7	1,140	1,049	958	50,590	198

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: C Per Call: 3 Warranty: B
Metering: I/O Unit (online) Purchase Option: 40%
Termination Charge Months: 5 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 10%
Upper Limit Percent: 0%

* FTP is 12-23 months.

**2501 CARD READER**

Purpose: Punched card input unit for a S/360 mdl 22 thru 85 and 195, any S/370 Processor, or any 4300 Processor.

For description and use of the 2501 mdl A1 or A2 with the 1130, System/3 or S/360 mdl 20, see the GSD Manual.

Model Rated 80-column Card Speed

B1	600/minute
B2	1,000/minute

Model Changes: Can be made only between mdls A1 and A2, or between mdls B1 and B2.

Highlights: The system's processing unit performs all format control and analysis. The unit provides high-speed, low-cost card input. Cards are read serially by a light sensing mechanism which is checked for proper functioning in every card cycle. The Extended BCD Interchange Code (256 codes) can be read ... invalid codes, off-punching and mispositioned cards are detected. Models B1 and B2 include their own control unit.

Binary Codes: A model B1 or B2 must be equipped with Card Image (#1531) to read binary codes ... see "Special Features."

All models have a 1,200-card capacity hopper and a 1,300-card capacity stacker.

Maximum:

S/360 mdl 22 thru 85, 195, any S/370 Processor, or any 4300 Processor -- the number of 2501 mdls B1 and/or B2 that can be attached depends upon the number of system channel control unit positions available. **Caution:** When attaching to S/370 mdl 115, 125, 135, 135-3 or 138, see performance limitations.

Prerequisites:

S/360 mdl 22 thru 85, 195, any S/370 Processor, or any 4300 Processor -- an available control unit position on a system channel.

S/360 mdl 25 -- special features on 2025: Multiplexer Channel, or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features, except 2022, one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channel, Add'l High Speed Multiplexer Subchannels ... see 2044.

S/360 mdl 65, 67, 75 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 85, 195 or S/370 mdl 165, 168, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, or shared subchannel of 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channels (special features), or Block Multiplexer Channel (special feature) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 --- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard).

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.

Performance Limitations:

1. The 2501 is an unbuffered time-dependent machine. If the CPU does not reissue a new card read command within 19.4 ms for the 2501 mdl B1, or 3.5 ms for the 2501 mdl B2, the card reader performance will be reduced to one half the rated speed; or less if the processing time exceeds 100 ms. or 60 ms. respectively.

2. For S/370 mdl 115 operating under DOS/VS, special precautions must be taken in order to operate the 2501 mdl B2 near rated speed. Some methods for achieving this are to use either the Power/VS option or to use programs employing chained card read commands.

3. For S/370 mdl 125, 135, 135-3 or 138 operating under DOS/VS, special precautions must be taken in order to operate the 2501 mdl B2 at or near rated speed. Some methods for achieving this are to use either the Power/VS option or to use programs employing chained card read commands.

Card Limitations: Generally, scored cards require careful handling and a favorable environment. Use of the following scores has been approved:

Internal Scores(before separation) -- M-4, M-5, OM-2, OM-3, S1 and ID-3 (2" x 3-1/4" or 2-3/16" x 3-3/4" sizes only). **Note:** When using OM-2 or OM-3, reading must be terminated prior to the column that is scored.

External Scores (after separation) -- M-3, M-4, M-5, M-6, M-7, M-11, OM-2, CF-4 and CF-11. OM-3 may be used if the score is on the column 1 end. **Note:** Upper left corner cut required when the M-11 or C-11 is used on column 1 end.

All other scores may result in unsatisfactory performance.

Aqua cards and C-4 corner cut cards

cannot be used.

Bibliography: S/360 -- GC20-0360 S/370 -- GC20-0001

Specify: [1] Voltage (AC; 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V. Must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Isolation, Control Unit: May be required on units shipped prior to December 29, 1967 ... see "Special Features" below.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	2501			
	B1	\$336	\$16,310	\$84.00
	B2	413	16,570	91.00

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Maintenance: C Per Call: 3 Warranty: B

Metering: I/O Unit (Online) Purchase Option: 40%

SPECIAL FEATURES

CARD IMAGE (#1531). [Model B1 or B2 only] Permits reading of cards with multiple punches in a single card column. When reading in card image mode (Data Mode 2), the validity check is suspended because all characters are considered valid.

ISOLATION, CONTROL UNIT (#4700). [Model B1 or B2 only ... for field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2501 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements,

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Card Image	#1531	\$36	\$1,740	\$1.00
Isolation, Control Unit	4700	NC	NC	NC



DP Machines

M 2502
May 79

2502 CARD READER

Purpose: Punched card input unit for a 2770 or 3770 Data Communication System, a System/7 (5024), or an 8100 Information System via 3289 Printer mdl 3.

Model Rated 80-column Card Speed

A1	150/minute (not with System/7)
A2	300/minute (not with 8100)
A3	400/minute (3776-3,3776-4,3777 only)

Model Changes: Can be made in the field.

Highlights: On the 2772, 3289-3, 3774, 3775, 3776 or 3777 used for automatic entry of punched card data to the transmission line or to offline operation units. The 2772 Multi-purpose Control Unit or 3774, 3775, 3776 or 3777 Communication Terminal or 3289-3 printer performs all format control and analysis.

Cards are read serially by a sensing mechanism which is checked for proper functioning in every card cycle. EBCDIC (256 characters) or ASCII (128 characters) code can be read, depending upon the transmission code specified for the 2772, 3774, 3775, 3776 or 3777. EBCDIC (256 characters) can be read and transmitted by the 3289-3. ASCII is not applicable to the 3777-2. Invalid codes, off-punching and mispositioned cards are checked.

On the System/7, used for automatic entry of punched card data to the system. The 5024 I/O Attachment Enclosure (mdls 2 or 3) performs all format control and analysis.

Hopper capacity is 700 cards ... stacker capacity is 600 cards.

Card Limitations: Generally, scored cards require careful handling and a favorable environment. Use of the following has been approved.

External Scores: Column 1 end -- M-3, M-4, M-5, M-6, M-7, M-11, OM-2, OM-3, CF-4 and CF-11. Column 80 End -- M-5, M-7, M-11, CF-4, CF-11.

Internal Scores: M-4, M-5, S-1, S-2, ID-1, ID-2 and ID-3.

All other scores may result in unsatisfactory performance.

C-4 corner cut cards cannot be used.

Prerequisites:

For Model A1 -- 2502 Model A1 Attachment (#8020) on the 2772 ... 3782/2502 Card Reader Attachment (#8149) on the 3289-3, 3774, 3775 or 3776 and a 3782 Card Attachment Unit mdl 2 ... 2502 Card Reader Attachment (#8002) on the 3777.

For Model A2: -- 2502 Mdl A2 Attachment (#8021) on the 2772 ... 3782/2502 Card Reader Attachment (#8149) on the 3774, 3775 or 3776 and a 3782 Card Attachment Unit mdl 2 ... 2502 Card Reader Attachment (#8002) on the 3777 ... 5024 mdl 2 or 3 with System/7.

For Model A3 -- 3782/2502 Card Reader Attachment (#8149) on the 3776 mdl 3 or 4 and a 3782 Card Attachment Unit mdl 2 ... 2502 Card Reader Attachment (#8002) on the 3777.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): For use with 2772 -- #9902 for 208 V, or #9904 for 230 V. Must be consistent with system voltage. For use with 3289-3, 3774, 3775, 3776, 3777 or System/7 -- #9901 for 115 V.

[2] Color: #9045 for gray when used with 2772 ... #9046 for white when used with 3289-3, 3774, 3775, 3776, 3777 or System/7.

[3] Documentation: One must be specified -- #9100 for use with a 2772, #9101 for use with a 3289-3, 3774, 3775 or 3776, #9102 for use with a 3777, or #9103 for use with a System/7.

[4] Cabling: Fixed length cables are supplied as standard.

Mdl	MAC/ MRC	Purchase	MMMC
2502 A1	\$143	\$6,160	\$50.50
A2	179	6,680	50.50
A3	213	6,880	65.00

Plan Offering: Plan B Warranty: B Maintenance: C
Purchase Option: 30% Useful Life Category: 2 Per Call: 2

SPECIAL FEATURES (not with System/7 -- 5024)

INTERCHANGEABLE FEED, 51/80 COLUMN (#4650). Permits reading of 51 or 80-column cards. Operator can readily set up machine to read 51-column cards and reconvert it to read 80-column cards. **Limitation:** Cannot be installed with Interchangeable Feed, 66/80 Column (#4651).

INTERCHANGEABLE FEED, 66/80 Column (#4651). Permits reading of 66 or 80-column cards. Operator can readily set up machine to read 66-column cards and reconvert it to read 80-column cards. **Limitation:** Cannot be installed with Interchangeable Feed, 51/80 Column (#4650).

OPTICAL MARK READ (#5450). [not with 3289 mdl 3, 3776 mdl 3 or 4 or 3777] For reading of up to 40 columns of marked data. Either marked and/or punched hole data can be read from the same card. Cards on which a mark was unacceptable are offset stacked and the reader continues operation when in line mode. **Prerequisite:** Optical Mark Read (#5450) on the 2772, or Optical Mark Read (#5455) on a 3782 mdl 2 attached to a 3774, 3775 or 3776 mdl 1 or 2.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Interchangeable Feed				
51/80 Column	#4650	\$31	\$1,330	\$16
66/80 Column	4651	31	1,330	16
Optical Mark Read	5450	141	5,830	29
				266



2520 CARD READ PUNCH

Purpose: Combination punched card I/O unit for a S/360 mdl 22 thru 85 and 195, any S/370 Processor, or any 4300 Processor.

For description and use of the model A1 with S/360 mdl 20, see GSD manual.

Model	Rated 80-col Card Speed	For use with
B1	500/minute read & punch	S/360 mdl 22 thru 85 & 195 Any S/370 Processor

Model Changes: Can be made between mdl A1 and the 2520 Card Punch mdl A2 or A3, or between mdl B1 and the 2520 Card Punch mdl B2 or B3.

Highlights: All reading and punching format control and analysis are performed by the system's processing unit. The unit has a 1,200 card capacity hopper and two 1,300 card capacity stackers. The Extended BCD Interchange Code (256 codes) can be read or punched.

Binary Codes: A model B1 must be equipped with Card Image (#1531) to read or punch binary codes. See "Special Features."

Input Section: Reads serially while the preceding card is passing the punching station. The light sensing mechanism is checked for proper functioning in every card cycle. Invalid codes and mispositioned cards are detected.

Output Section: Punches parallel, row by row, while the following card is passing the read station. Blank or prepunched cards can be punched. Cards go to stacker 1 unless directed to stacker 2 by the processing unit. Punching is checked. Cards in which punch errors are detected are automatically selected into stacker 1 on model B1.

Maximum:

S/360 mdl 22 thru 85, 195, any S/370 Processor or any 4300 Processor -- the number of 2520 mdl B1s that can be attached depends upon the number of system channel control unit positions available.

PREREQUISITES:

S/360 mdl 22 thru 85, 195, or any S/370 Processor -- the mdl B1 includes its own control and requires an available control unit position on a system channel.

S/360 mdl 25 -- special features on 2025: Multiplexer Channel or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features, except 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, Add'l High Speed Multiplexer Subchannels ... see 2044.

S/360 mdl 65, 67, 75 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 85, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, shared subchannel of 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- multiplexer channel (standard), Block Multiplexer Channels (special features), Block Multiplexer Channels (special features) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

S/370 mdl 165, 168, 195 -- selector channel of 2860, basic

multiplexer channel of 2870, Selector Subchannels (special features) on 2870, shared subchannel of 2880 ... see 2860, 2870, 2880.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.

Card Limitations: Generally, scored cards require careful handling and a favorable environment. Use of the following has been approved.

Internal Scores (before separation) -- M-4, either OM-2 or OM-3 without round corner cut on score, ID-1, ID-2, ID-3, S-1 ... OM-2 and OM-3 with round corner cut may be used if the score is in column 27 ... M-5 may be used if the operator limits the stacker to 1,000 cards ... cards folded at the crease (Card Fold Crease S-2) must be properly flattened. **Note:** When using OM-2 or OM-3, reading must be terminated prior to the column that is scored.

External Scores (after separation) -- M-3, M-4, M-5, M-6, M-7, M-11, CT-4 and CF-11 ... OM-2 may be used if the score is on the column 1 end.

All other scores may result in unsatisfactory performance.

Aqua cards and C-4 corner cut cards

cannot be used.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz) ... #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Isolation Feature: May be required on units shipped prior to December 29, 1967 ... see "Special Features."

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
	2520 B1	\$1,180	\$44,420	\$286

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: C Per Call: 3 Warranty: B
Metering: I/O Unit (Online) Purchase Option: 40%

SPECIAL FEATURES

CARD IMAGE (#1531). Permits reading and punching cards with multiple punches in a single column. When reading in card image mode (Data Mode 2), validity checking is suspended because all characters are considered valid.

ISOLATION, CONTROL UNIT (#4700). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2520 without generating spurious signals. Thus, a CPU program, if it can logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements,

Special Feature Prices:	MAC/MRC	Purchase	MMMC	FIC
Card Image	#1531 \$37	\$1,740	\$1.00	\$118
Isolation, Control Unit	4700 NC	NC	NC	NC



2520 CARD PUNCH Models B2, B3

Purpose: High-speed punched card output unit for a S/360 mdl 22 thru 85 and 195, any S/370 Processor, or any 4300 Processor.

For description and use of the model A2 or A3 with S/360 mdl 20, see GSD manual.

Model	Rated 80-col Card Speed	For use with
B2	500/minute	S/360 mdl 22 thru 85 or 195
B3	300/minute	Any S/370 Processor

Model Changes: Can be made between mdl A2 and A3, or between A2 or A3 and a 2520 Card Read Punch mdl A1 ... or between mdl B2 and B3, or between B2 or B3 and a 2520 Card Read Punch mdl B1.

Highlights: The system's processing unit performs all format control and analysis. The unit has a 1,200-card capacity hopper and two 1,300-card capacity stackers. The Extended BCD Interchange Code (256 codes) can be punched.

Punches parallel, row by row. Blank or prepunched cards can be punched. Cards go to stacker 1 unless directed to stacker 2 by the processing unit. Punching is checked. Cards in which punching errors are detected are automatically selected into stacker 1 on mdls B2 and B3.

Binary Codes: A model B2 or B3 can punch binary codes when equipped with Card Image (#1531) ... see "Special Features."

Maximum: S/360 mdl 22 thru 85, 195, any S/370 Processor or any 4300 Processor -- the number of 2520 mdls B2 and B3 that can be attached depends upon the number of system channel control unit positions available.

Prerequisites:

S/360 mdl 22 thru 85, 195, any S/370 Processor or any 4300 Processor -- a mdl B2 or B3 includes its own controls and requires an available control unit position on a system channel.

S/360 mdl 25 -- special features on 2025: Multiplexer Channel, or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features), except on 2022 one selector channel is standard ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channels, High Speed Multiplexer Channel, Add'l High Speed Multiplexer Subchannels ... see 2044.

S/360 mdl 65, 67, 75 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 85, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, shared subchannel of 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channels (special features), Block Multiplexer Channel (special feature) ... see 135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), selector channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channel (first two are standard) ... see 3155, 3158.

S/370 mdl 165, 168, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, shared subchannel of 2880 ... see 2860, 2870, 2880.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.

Card Limitations: Generally scored cards require careful handling and a favorable environment. Use of the following scores has been approved:

Internal Scores (before separation) -- M-4, either OM-2 or OM-3 without round corner cut on score, ID-1, ID-2, ID-3, S-1 ... OM-2 and OM-3 with round corner cut may be used if the score is in column 27 ... M-5 may be used if the operator limits the stacker to 1,000 cards ... cards folded at the crease (Card Fold Crease S-2) must be properly flattened.

External Scores (after separation) -- M-3, M-4, M-5, M-6, M-7, M-11, CF-4, CF=11, OM-3 ... OM-2 may be used if the score is on the column 80 end.

All other scores may result in unsatisfactory performance.

Aqua cards and C-4 corner cut cards cannot be used.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Isolation Feature (mdl B2 or B3 only): May be required on units shipped prior to December 29, 1967 ... see "Special Features."

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
2520	B2	\$1,050	\$39,340	\$268
	B3	810	39,010	215

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: C Per Call: 3 Warranty: B
Purchase Option: 40%

SPECIAL FEATURES

CARD IMAGE (#1531). [Model B2, B3 only] Permits punching cards with multiple punches in a single column.

ISOLATION, CONTROL UNIT (#4700). [Model B2, B3 only ... for field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2520 mdl B2 or B3 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating.
Prerequisite: in all cases there are compatible EC level requirements.

Special Feature Prices:		MAC/MRC	Purchase	MMMC	FIC
Card Image	#1531	\$37	\$1,740	\$1.00	\$70
Isolation, Cntrl Unit	4700	NC	NC	NC	NC



DP Machines
2540 CARD READ PUNCH

M 2540
 May 79

SPECIAL FEATURES

Purpose: Combination punched card I/O unit for a S/360 mdl 22 thru 85, 195, any S/370 Processor, or any 4300 Processor.

Highlights: When used in conjunction with a 2821, fully buffered card reading and punching is provided. When attached to a 2025 via the Integrated 2540 Attachment (#4591), card reading and punching is buffered directly into core memory.

The system's processing unit performs all format control and analysis. The unit has five 1,350-card capacity stackers located between the read and punch feeds. The center stacker can be fed from either feed, but should be reserved to only one side during a machine run. The Extended BCD Interchange Code (256 codes) can be read or punched.

Input Section -- cards are fed from a 3,100-card capacity file feed at a rated speed of 1,000 cards/minute ... limited to 800 cards/minute when 51-column Interchangeable Read Feed (#4151) is installed. Actual speed depends upon the operation. Cards go to the normal (R1) stacker unless program-directed to stacker R2 or R3 (center stacker). Has two sets of reading brushes ... first for "hole-count" ... second for reading and "hole-count" proving. Invalid codes set an error indicator.

Output Section -- cards are fed from a 1,350-card capacity hopper at a rated speed of 300 cards/minute. Actual speed depends upon the operation. Cards go to normal (P1) stacker unless program-directed to stacker P2 or RP3. Reading brushes check "hole-counts" and cannot read data into the system. Only blank cards can be fed through the punch feed. Prepunched cards cause incorrect "hole-counts" which set error indicator and direct error cards to stacker P1.

Prerequisites:

S/360 mdl 22, 30 thru 85, 195, any S/370 Processor or any 4300 Processor -- a 2821 Control Unit mdl 1, 4, 5 or 6. **Note:** 2540 Compatibility Attachment (#8065) is required on the 2821 if the 2540 is to be used in compatibility mode with a 2030 equipped with 1401/1440/1460 Basic Compatibility and 1402/1403 Attachment (#4463), with a 2030 equipped with 1620 Compatibility (#7190), or with a 2040 equipped with 1401/1460 Compatibility (#4457).

S/360 mdl 25 -- a 2540 can be attached via the Integrated 2540 Attachment (#4595) on the 2025, or via a 2821 Control Unit mdl 1, 4, 5 or 6 attached to a Multiplexer Channel (#5249) or Selector Channel (#6960) on the 2025. When attached via #4595 on the 2025, a S/360 Model 25 Adapter (#9725) is required on the 2540 ... see "Specify."

Card Limitations: Prepunched cards can be processed through the punch feed only if Punch Feed Read (#5890) is installed ... see "Special Features."

When attached to a 2821, binary cards and cards with multiple significant digit punching in a single column can be processed only if Column Binary (#1990) is installed on the 2821 ... column binary is standard on the Integrated 2540 Attachment (#4595) on the 2025.

Because cards are stacked on end, internally scored cards (M-3, OM-3) or cards that have been folded at the crease (S-2) are not recommended for use ... only the following have been approved for use: Before separation -- M-4, S-1; after separation -- M-3, M-4, M-5, M-7, M-11, CF-4, CF-11.

Bibliography: S/360 -- GC20-0360 S/370 -- GC20-0001.

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60Hz); #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] S/360 Model 25 Adapter: #9725. Required if the 2540 is to be attached via the Integrated 2540 Attachment (#4595) on a 2025. Can be field installed.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	2540	1	\$920	\$36,920
				\$196

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Maintenance: C Per Call: 3 Warranty: B
 Purchase Option: 45% Metering: I/O Unit (Online)

51-COLUMN INTERCHANGEABLE READ FEED (#4151). [plant installation only] For 80 or 51-column cards ... read feed only. The 51 columns correspond to columns 15 through 65 of an 80-column card. A card weight, adapter tray, and removable side plates are provided for the standard file feed. Two card stackers, R1 and R2, are modified so that the operator can adjust for 80 or 51-column operation. When the stackers are set for 51-column mode, the system reads only the 51 columns of data in read positions 15 through 65 and the capacity of stackers R1 and R2 is reduced to 800 cards. **Limitation:** When this feature is installed, reading speed is permanently reduced from 1,000 cpm to 800 cpm.

PUNCH FEED READ (#5890). For punching output data into the same card from which input data was read. Adds a special set of 80 reading brushes one station ahead of the punch station. **Limitations:** Column binary cards cannot be read in the punch feed ... refer to SRL GA21-9033 for limitations on use of prepunched cards. **Prerequisite:** When attached to a 2821, Punch Feed Control (#5895) on the 2821 ... when attached to a 2025 via Integrated 2540 Attachment (#4595), Punch Feed Read Control (#5895) on the 2025.

TWO CHANNEL SWITCH ADAPTER (#8102). Required if the 2540 is to be used with a 2821 equipped with a Two Channel Switch (#8100) ... permits the read and punch feeds of the 2540 to be reset independently. **Prerequisite:** Two Channel Switch (#8100) on 2821.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC	
51-col Inter Read Feed	#4151	\$80	\$4,030	\$53.50	PO
Punch Feed Read	5890	33	1,045	5.50	\$241
Two Chnl Switch Adptr	8102	NC	NC	NC	NC



2560 MULTI-FUNCTION CARD MACHINE

Purpose: A multi-function card input/output unit for a S/360 mdl 25, or a S/370 mdl 115 or 125.

For use with System/3 model 15 or S/360 mdl 20, see GSD manual.

Model A1 For native attachment to a 2025, 3115 or 3125, or for a 5415.

Model A2 For a S/370 mdl 115, or for a 5415.

Model Changes: Can be made in the field only from mdl A2 to A1 (without Card Print feature).

Highlights: Provides the combined functions of a card reader/punch, collator, and, with Card Print (#1575 - 1577) on a mdl A1, card interpreter/document printer in one unit. Permits collating, gangpunching, reproducing, summary punching, punching of calculated results, printing and classifying of cards in a single pass of the cards. The Extended BCD Interchange Code (256 codes) can be read and punched ... with a 2025, binary codes may also be read ... with 3115 or 3125, binary codes may be both read and punched.

Input Section -- separate primary and secondary card hoppers, each with a 1,200-card capacity, feed cards independently in separate paths through pre-read, read and pre-punch stations. Rated serial reading is at 500 cards/minute from either hopper with mdl A1, or 310 cards/minute with mdl A2. The common reading unit, a light sensing mechanism, is checked for proper functioning on each read cycle. Invalid codes, off-punching, and mispositioned cards are detected.

Output Section -- from the separate primary and secondary pre-punch stations, cards merge into a common path past the punch, pre-print and print stations, and on into any one of the radial stackers, each with a 1,300-card capacity. Mdl A1 has five stackers and Mdl A2 has four stackers. Blank or pre-punched cards can be punched.

	Model A1	Model A2
Rated serial punching speeds	160 cols/sec	120 cols/sec
Some rated throughputs, cards/minute, are:		
First 10 columns only	260	173
First 40 columns only	145	100
First 60 columns only	112	79
80 columns	91	65

Actual speed depends upon the last column punched. Interspersed columns between fields to be punched are counted at the rated serial punching speed.

Multi-function -- with the ability to move cards from either hopper under independent control to the punching station and with complete stacker selection flexibility, the common card functions of collating, reproducing, gangpunching, summary punching, and selective stacking can be accomplished ... singly or in combination.

Limitation: When operating in S/360 mode on a S/360 mdl 25, the 2560 performs only the read/punch functions of the 2540 Card Read Punch ... for operation in S/360 mode, 2540 Emulation Control (#7800) is required on the 2025 in addition to the Integrated 2560 Attachment (#4596).

Note: If #7800 is installed on the 2025, emulation of a 2501, 2520 or 1442 mdl 5 in S/360 mode is not possible on the 2025 since #7800 and the Integrated 2540 Attachment (#4595) cannot both be installed. See #4595, #4596 and #7800 under "Special Features" for the 2025.

Maximum: One 2560 can be attached to a S/360 mdl 25, a S/370 mdl 115 or 125.

Prerequisites:

For S/360 mdl 25 -- the 2560 mdl A1 requires Integrated 2560 Attachment (#4596) and S/360 Model 20 Mode (#7600) on the 2025 ... the 2560 itself requires a S/360 Model 25 Adapter (#9725). See "Specify." If the 2560 is to emulate a 2540 when operating in S/360 mode, 2540 Emulation Control (#7800) is required on the 2025 in addition to #4596 and #7600.

For S/370 mdl 115, 125 -- the 2560 requires Integrated 2560 Attachment (#4670) on the 3115/3125 and the 2560 itself requires a S/370 Model 115 Adapter (#9727), or a S/370 Model 125 Adapter (#9726) ... see "Specify."

Card Limitations: Generally, scored cards require careful handling and a favorable environment. Use of the following scores has been approved.

Internal Scores (before separation) -- S-1, and for a maximum

of five passes, M-4 ... M-5 may be used if the operator limits the stackers to 1,000 cards and the number of passes does not exceed five ... cards folded at the crease (card fold crease S-2) must be properly flattened.

External Scores (after separation) -- for reading, punching and printing: On the column 1 end -- M-7, M-11 and CF-11; On the column 80 end -- M-3, M-6*, M-7, OM-2* and CF-4* (maximum of five passes for C-4). For reading only: On column 80 end -- M-4, M-5, M-11 and CF-11.

*Punching not recommended if card has O.K. verify notch.

All other scores may result in unsatisfactory performance.

Aqua cards and C-4 corner

cut cards cannot be used.

Bibliography: S/360 mdl 25 -- GC20-0360, S/370 mdl 115, 125 -- GC20-0001

Specify: [1] Voltage (AC, 60 Hz, power provided by system): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] S/360 Model 25 Adapter (mdl A1 only): #9725. Required if the 2560 is to be attached to a 2025 ... can be field installed.

[4] S/370 mdl 115 Adapter: #9727. Required if the 2560 is to be attached to a 3115 ... can be field installed.

[5] S/370 Mdl 125 Adapter (Mdl A1 only): #9726 ... can be field installed.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
2560	A1	\$799	\$21,230	\$182
	A2	621	15,590	182

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: C Per Call: 2 Warranty: B
Metering: I/O Unit (Online) Purchase Option: 40%

SPECIAL FEATURES

CARD PRINT (#1575, 1576, 1577). [Model A1 only] [#1575 -- plant installation only] Each provides a print unit with two print heads for printing two lines. Printing is on the face-down side of cards passing through the print unit. Each head prints a maximum horizontal line of 64 printing positions, spaced 10 characters/inch, extending approximately between card columns 2 and 75. Printing can be operator-adjusted to any of the 25 line positions from above the "12-punch" row to below the "9-punch" row ... see "Limitation" below. Each head prints any of the characters from the standard 63-character set printed by a 1443 mdl N1 or 2203 Printer. Rated speed is 140 print positions/second, regardless of the number of heads per print position simultaneously activated ... interspersed blank print positions between fields to be printed count at the 240 position/second rate. Actual speed depends upon the location of the last position, on any line, printed on a card. #1575 -- for first two lines ... #1576 -- for second two lines ... #1577 -- for third two lines. **Limitation:** In punched fields, printing on any of the twelve even numbered lines will probably result in parts of characters being lost because of printing on holes, and should normally be avoided ... printing on line position 5 should be avoided because of possible smearing. **Prerequisites:** Card Print Control (#1580) on the 3115 or 3125 ... #1576 requires #1575 ... #1577 requires #1576.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Card Print [mdl A1 only]				
first two lines	#1575	\$172	\$4,625	\$24.50 PO
second two lines	1576	172	4,625	24.50 \$388
third two lines	1577	172	4,625	24.50 388



2671 PAPER TAPE READER

Purpose: Paper tape input unit for a S/360 mdl 22, 25, 30, 40, 44, 50, 67 or S/370 mdl 115 thru 158, a 3031 or 3032 Processor, or any 4300 Processor.

with the addition of special features, also reads reels or rolls of tape. See "Special Features."

Tape can be 11/16" (5-track telegraphic code), 1" (8-track code), or 7/8" (6 and 7-track codes) ... any of the three tape widths can be selected by the operator by a switch setting. Tape is chad type.

Reads at up to 1,000 characters/second. Addition of special features for reel or roll input and takeup provide for center roll or reel feeding and reel rewinding at a minimum of 500 characters/second. With these special features installed, strip reading can still be accomplished at up to 1,000 characters/second.

Buttons and switches are used to set particular end-of-record codes, tape codes and widths, parity, and delete recognition. Lights signal status conditions.

Supplies: The following tapes, or their equivalents, are used -- 190216 or 304469

Prerequisite: Each 2671 requires a 2822 Paper Tape Reader Control ... the 2671 is placed on top of the 2822 as a table-top reader.

Limitation: Unlike the 1011 Paper Tape Reader, the standard 2671 does not have the ability to read feed holes.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

Specify: Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC	
	2671	1	\$156†††	\$5,785†††	\$35.50

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: C Per Call: 3 Warranty: B
Purchase Option: 45%
Metering: I/O Unit (Online ... meters 2822)

SPECIAL FEATURES

CENTER ROLL FEEDING (#1842). For feeding 10-1/2" rolls from the center. **Prerequisite:** Supply Option (#7580).

SUPPLY OPTION (#7580). For feeding 10-1/2" rolls from the outside.

TAKE-UP OPTION (#7812). Provides 10-1/2" reels for rewinding tape. **Prerequisite:** Supply Option (#7580).

Special Feature Prices:		MAC/ MRC	Purchase	MMMC	FIC
Center Roll Feeding	#1842	\$28	\$1,060	\$5.50	\$100*
Supply Option	7580	38	1,205	8.50	500
Take-up Option	7812	38	1,205	7.00	399

* If #1842 and #7580 are installed at the same time, the FIC for #7580 covers both.

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††† Manufactured in France. Shipping charges from point of shipment in U. S.



TERMINOLOGY

In these pages, the term "Data Terminal Equipment" and its abbreviation "DTE" will mean any business machine which has a telecommunications capability, be it a terminal, a multiplexer or a CPU with an integrated communications adapter.

Also, the term "Data Communications Equipment" and its abbreviation "DCE" will mean any equipment whose function it is to convert DTE signals into a form suitable for transmission over a communications facility, and to convert signals received from a communications facility into a form suitable for transfer to a DTE. This DCE may be a modem (MODulator/DEModulator), a telegraph line adapter or another type of signal converter equipment.

Finally, the term "Automatic Calling Equipment" and its abbreviation "ACE" will mean that equipment which will accept dial digits from the DTE and present them to the telephone central office for the purpose of effecting a switched network connection.

ORGANIZATION

These pages are organized into three communications capability charts, which are:

- #1, IBM Start/Stop DTE Intercommunication Capability Table
- #2, IBM Synchronous DTE Intercommunication Capability Table
- #3, IBM Parallel Tone DTE Intercommunication Table

and seven communication facility charts which are:

- #A, Common Carrier Private Line (non-switched) Telegraph Channels
- #C, Common Carrier Public Switched Networks
- #D, Common Carrier Private Line (non-switched) Voice Grade Channels
- #E, Common Carrier Private Line (non-switched) Wideband Channels
- #G, Customer Owned & Maintained Limited Distance Facilities
- #H, Common Carrier Parallel Transmission Channels
- #X, Common Carrier Private Line (non-switched) Digital Data Communications Services

UTILIZATION

To utilize these pages:

- First, refer to the appropriate intercommunications chart, finding the desired DTEs, and determining if they are capable of intercommunications.
- At the intersection of the row and column associated with the desired DTEs, read the alphabetic designations for the facilities over which they may communicate.
- Refer to the charts for the facilities so designated to find the particular facility and the required feature codes for the DTEs which will allow their communication.
- Refer to the individual "Machines" sales manual pages for the DTEs to determine prerequisites, restrictions, etc.

For example, assume that communications between a 2740 mdl 2 and a 3705 is desired. Since this would obviously be in Start/Stop mode, the first reference would be to Chart 1.

- In Chart 1, at the intersection of the 2740 mdl 2 row and the 3705 column, the entry reads "ADG". This entry points to Facility Charts A, D and G.
- Reference to these Charts show that, since feature codes are entered for both the 2740 mdl 2 and the 3705, communications between them is possible over Facilities A4, D1, D1M, D2, D2M, G1 and G2.
- Further, the A, D and G Facility Charts show, for both the 2740 mdl 2 and the 3705, the feature codes required on each to allow this intercommunications.
- Finally, reference should be made to the M 2740 and M 3705 pages to assure that any restrictions or prerequisites to the installation of the indicated features are satisfied.

MULTIPLE SUPPLIER SYSTEMS POLICY

Non-IBM modems are attached to IBM DTEs under the provision of the IBM Multiple Supplier Systems Policy

Such attachments are delineated in the "M" suffix facilities in these pages, and information on the DCEs so attached is available. See "Reference Material" following.

CUSTOMER RESPONSIBILITIES

The customer must be advised in writing, that:

- He is responsible for making arrangements for price quotations, installation and cost (initial and recurring) of the common carrier supplied facilities/services.
- He is responsible for all toll charges incurred in the installation and maintenance of the IBM equipment.
- He must be prepared to relinquish the system for service in those cases in which service aids or available error message printouts do not permit localization of a malfunction to the communications facility or terminal location.
- He is responsible for the DTE/DCE and DTE/ACE interface compatibility when he, or the common carrier, provides the DCE or ACE.
- He is responsible to perform the set up procedures for customer set-up terminal products.
- He is responsible for using and following problem determination procedures and using recovery routines as furnished by IBM for the 3767 and 3770 terminals prior to calling IBM for service.

Due to the nature of the teleprocessing environment, it is possible that the throughput anticipated on the specified network configuration with recommended channel conditioning will not be achieved. The probability of this is slight, though it is more likely at the higher data signalling rates or when using an acoustic coupler. Some actions that can be taken if anticipated throughput is not achieved are:

- re-dialing the connection if operating on the Public Switched Telephone Network
- adjusting the block size, where possible, to optimize throughput based on the error characteristics of the communications facility being used
- requesting the Common Carrier, if appropriate, to provide alternate routing or facility improvements. This is normally provided at extra cost. The Common Carrier's representative should be contacted for further details.

However, it is possible that, at a particular location, only lower speed operation will be possible.

In addition, the customer should be advised that his local IBM representative is available to assist him in analyzing and planning for his responsibilities in installing or operating teleprocessing configurations.

When using IBM Modems, IBM Integrated Modems or IBM Line Adapters, it is recommended that the customer investigate the economics of providing alternate voice service to facilitate installation and maintenance.

MULTIPOINT OPERATION

Duplex communications facilities are required for multipoint systems in which:

- the DCE at the control station is a 1200 bps Integrated Modem, or
- it is desired that a continuous carrier be maintained on the line from the control station thereby eliminating the control station "Ready for Sending" delays.

The use of duplex facilities and the operation in the continuous carrier mode is strongly recommended since operation in a non-continuous carrier mode (by the control station) will subject the system to inordinate delays, particularly in the polling and addressing sequences.

CHART 1

Start/Stop Data Terminal Equipment Intercommunication Capability Chart

	2701	2702	2703	3115 3125	3135 3138	3704 3705	3792	3845 3846	4331	4955	8130 8140 8101
1031A	DG	DG	DG	D		DG		DG			
1034	D	D	D	D		D		D			
1071	DG	DG	DG					DG			
2740 mdl 1	CDG	CDG	CDG	CD	CD	CDG		CDG	CD	CD	
2740 mdl 2	DG	ADG	ADG	AD	D	ADG		DG	D		
2741	CDG	CDG	CDG	CD	CD	CDG	CD	CDG	CD	D	
3767	D			CD	CD	CD(B)		CD	CD		
5010	CDG	CDG	CDG	CD	CD	CDG		CDG	CD		
5100,5110				CD	CD	CD	CD			CD	
CMCST	C	C	C	C	C	C		C	C		
TTY (1)	A	A	A	A		A					
TWX 33/35	C	C	C	C	C	C					
TWX 37						C					
3845,3846	CDG	CDG	CDG	CD	CD	CDG	CD				D



CHART 2
Synchronous Data Terminal Equipment Intercommunication Capability Chart

	2701	2703	2715	3115	3125	3135 3138	3271 1,2	3271 11,12	3274 1C	3275 2	3275 12	3276 1-4	3276 11-14	3601 3602	3603	3604	3614 3624	3631 3632	3651 M25	3651 M50	3651 M75	3659	3661	
2701	CDEX	CD	CD	CDEX	CDEX	CDX	DX		DX	CDX		DX												
2703	CD	CD	CD	CD	CD	CD	D			CD														
2715	CD	CD		CD	CD	CD																		
3115	CDEX	CD	CD	CDEX	CDEX	CDX	DX		DX	CDX		DX												C
3125	CDEX	CD	CD	CDEX	CDEX	CDX	DX		DX	CDX		DX												C
3135, 3138	CDX	CD	CD	CDX	CDX	CDX	DX		DX	CDX		DX												C
3271-1,2	DX	D		DX	DX	DX																		
3271-11,12																								
3274-1C	DX			DX	DX	DX																		
3275-2	CDX	CD		CDX	CDX	CDX																		
3275-12																								
3276,1-4	DX			DX	DX	DX																		
3276,11-14																								
3601, 3602																D(4)	D(4)	DX(4)						
3603															D(4)	D(4)	D(4)	D(4)						
3604															D(4)	D(4)	D(4)	D(4)						
3614, 3624															DX(4)	D(4)	D(4)	DX(4)						
3631, 3632																								
3651-25																								
3651-50																								D
3651-75																						CDX		D
3659																								
3661				C	C	C																		
3669																								
3684	C	C		C	C	C																		
3704	CDEX	CD	CD	CDEX	CDEX	CDX	DX	DX(4)	DX(4)	CDX	DX(4)	DX(4)	CDX(4)	DX(4)	D(4)	D(4)	DX(4)	CDX	CDX	CD(4)	CDX		C	
3705	CDEX	CD	CD	CDEX	CDEX	CDX	DX	DX(4)	DX(4)	CDX	DX(4)	DX(4)	CDX(4)	DX(4)	D(4)	D(4)	DX(4)	CDX	CDX	CD(4)	CDX		C	
3735	CDX	CD		CDX	CDX	CDX																		
3741 **	CDX	CD		CDX	CDX	CDX																		
3747 **	CDX	CD		CDX	CDX	CDX																		
3767																								
3771	CDX			CDX	CDX	CDX																		
3773	CDX			CDX	CDX	CDX																		
3774	CDX			CDX	CDX	CDX																		
3775	CDX			CDX	CDX	CDX																		
3776	CDX			CDX	CDX	CDX																		
3777	CDX			CDX	CDX	CDX																		
3780	CDX	CD		CDX	CDX	CDX																		
3791													DX(9)											
3842																								
3845, 3846	CDX	CD	CD	CDX	CDX	CDX	DX	DX	DX	CDX	DX	DX	CDX	DX			DX				CD		C	
4331				CDX	CDX	CDX	DX	DX	DX	CDX	DX	CDX	CDX	CDX			DX	CDX	CDX	CDX	CDX		C	
4953,4955**	CDEX			CDEX	CDEX																			
5010 **	CDEX	CD		CDEX	CDEX	CDX																		
5110 **				CDX	CDX	CDX																		
5231-2 **	CDX	CD	CD	CDX	CDX	CDX																		
5320 **	CD			CDX	CDX	CDX																		
5340 **	CDX	CD		CDX	CDX	CDX																		
5381 **						CDX																		
5404 **	CDX	CD		CDX	CDX	CDX			DX			DX												
5406 **	CDX	CD		CDX	CDX	CDX																		
5408 **	CDEX	CD		CDEX	CDEX	CDX	D	D		CDX														
5410 **	CDEX	CD		CDEX	CDEX	CDX	C		DX	CDX		DX												
5412 **	CDEX	CD		CDEX	CDEX	CDX	C		DX	CDX		DX												
5415 **	CDEX	CD		CDEX	CDEX	CDX	C		DX	CDX		DX												
8101				DX	DX	DX							DX	DX										DX
8130, 8140				DX	DX	DX							DX	DX										DX
8775-11,12																								

** Refer to the M 2700 pages in the GSD manual for the applicable facilities and their associated feature/specify #s.



CHART 2 (cont'd)

	3669	3684	3704	3705	3735	3767	3771	3773	3774	3775	3776	3777	3780	3791	3842	3845	3846	4331	8101	8140	8130	8775
2701		C	CDEX	CDEX	CDX		CDX	CDX	CDX	CDX	CDX	CDX	CDX			CDX						
2703		C	CD	CD	CD								CD			CD						
2715			CDX	CDX												CD						
3115		C	CDEX	CDEX	CDX		CDX	CDX	CDX	CDX	CDX	CDX	CDX			CDX	CDX	DX	DX			
3125		C	CDEX	CDEX	CDX		CDX	CDX	CDX	CDX	CDX	CDX	CDX			CDX	CDX	DX	DX			
3135, 3138		C	CDX	CDX	CDX		CDX	CDX	CDX	CDX	CDX	CDX	CDX			CDX	CDX	DX	DX			
3271-1,2			DX	DX												DX	DX					
3271-11,12			DX(4)	DX(4)												DX	DX					
3274-1C			DX(4)	DX(4)												DX	DX					
3275-2			CDX	CDX												CDX	CDX					
3275-12			DX(4)	DX(4)												DX	DX					
3276.1-4			DX(4)	DX(4)												DX	CDX	DX	DX			
3276.11-14			CDX(4)	CDX(4)										DX(9)		CDX	CDX	DX	DX			
3601, 3602			DX(4)	DX(4)												DX	CDX					
3603			D(4)	D(4)																		
3604			D(4)	D(4)																		
3614, 3624			DX(4)	DX(4)												DX	DX					
3631, 3632			CDX	CDX											D		CDX	DX	DX			
3651-25			CDX	CDX													CDX					
3651-50			CD(4)	CD(4)												CD	CDX					
3651-75			CDX	CDX													CDX					
3659																						
3661			C	C												C	C					
3669			C	C												C						
3684			CD	CD																		
3704	C	CD	CDEX	CDEX	CDX	CDX(4)	CDX(4)	CDX(4)	CDX(4)	CDX(4)	CDEX(4)	CDEX(4)	CDX	CDX		CDX	CDEX	CDX	CDX			
3705	C	CD	CDEX	CDEX	CDX	CDX(4)	CDX(4)	CDX(4)	CDX(4)	CDX(4)	CDEX(4)	CDEX(4)	CDX	CDX		CDX	CDEX	CDX	CDX			
3735			CDX	CDX												CDX	CD					
3741 **			CDX	CDX												CDX	CDX					
3747 **			CDX	CDX												CDX	CDX					
3767			CDX(4)	CDX(4)												CDX	CDX	DX	DX			
3771			CDX(4)	CDX(4)												CDX	CDX					
3773			CDX(4)	CDX(4)												CDX	CDX					
3774			CDX(4)	CDX(4)												CDX	CDX					
3775			CDX(4)	CDX(4)												CDX	CDX					
3776			CDEX(4)	CDEX(4)												CDX	CDX					
3777			CDEX(4)	CDEX(4)												CDX	CDX					
3780			CDX	CDX									CDX			CDX	CD					
3791			CDX	CDX												CDX	CDX					
3842																					D	D
3845, 3846	C		CDX	CDX	CDX	CDX	CDX	CDX	CDX	CDX	CDX	CDX	CDX	CDX					CDX	CDX		
4331			CDEX	CDEX	CD	CDX	CDX	CDX	CDX	CDX	CDX	CDX	CD	CDX					CDX	CDX		
4953,4955**			CDEX	CDEX															CDEX			
5010 **			CDEX	CDEX												CDX	CDX					
5110 **			CDX	CDX															CDX			
5231-2 **			CDX	CDX															CDX			
5320 **			CDX	CDX												CDX	CDX					
5340 **			CDX	CDX															CDX			
5381 **				CDX															CDX			
5404 **			CDX	CDX															CDX			
5406 **			CDX	CDX												CDX	CDX					
5408 **			CDEX	CDEX	CDX											CDX	CDX					
5410 **			CDEX	CDEX	CDX											CDX	CDX					
5412 **			CDEX	CDEX	CDX											CDX	CDX					
5415 **			CDEX	CDEX	CDX											CDX	CDX					
8101			CDX	CDX		DX									D	CDX	CDX	DX	DX	DX		
8130, 8140			CDX	CDX		DX									D	CDX	CDX	DX	DX	DX		
8775-11,12																			DX	DX		

** Refer to the M 2700 pages in the GSD manual for the applicable facilities and their associated feature/specify #s.

CHART 3

Parallel Tone Data Terminal Equipment Intercommunication Capability Chart

	026	1001	7770
026		H	
1001	H		H
7770		H	

Notes for CHART 1, 2 and 3

- [1] The TTY terminals referred to are Telephone Company 83B2/83B3 or Western Union Plan 115A terminals.
- [2] The 2715 mdl 2, 3271 mdl 1, 2, 3275 mdl 2, 3735, 3780, System/3, System/32, System/34, S/360 mdl 20 or BSC equipped 3771s, 3773s, 3774s, 3775s, 3776s or 3777 mdl 1s can be intermixed as tributary stations on a multipoint non-switched line. The control station must be one of the following:
- a S/370 mdl 115, 125, 135 or 138 with an Integrated Communications Adapter and the appropriate BSC features.
 - a S/370 with an attached, appropriately configured, 2701, 2703, 3704 or 3705 ... see the M 2701, 2703, 3704 and 3705 pages for the CPU models to which these multiplexers may be attached.
- See SRL GA27-3004 for information on which BSC terminals may communicate with each other over point-to-point non-switched lines.
- See SRLs GC30-1005, GC30-2004 and GC30-5001 for the limitations and restrictions on these types of operations.
- [3] Appropriately configured 2701s, 2703s, 2715 mdl 2s, 3684s, 3704s, 3705s, 3735s, 3741s, 3747s, 3771s, 3773s, 3774s, 3775s, 3776s, 3777s, 3780s, System/3s, System/32s, System/34s, and S/370 mdl 115s, 125s, 135s and 138s may communicate over the public telephone network to the same BSC line appearance on a S/370 mdl 115, 125 or 135 or a S/370 with an attached, appropriately configured 2701, 2703, 3704 or 3705.
- See SRLs GC30-1005, GC30-2004 and GC30-5001 for the limitations and restrictions on this type of operation.
- [4] The 3271 mdls 11 and 12, 3274, 3275 mdl 12, 3276, 3601, 3602, 3614, 3624., 3631, 3632, 3651 mdl 50, 3684, 3767, 3771, 3773, 3774, 3775, 3776, 3777 (except 3777-2), 3791, System/32 and System/34 may communicate over a non-switched voice grade line with a 3704 or 3705 using Synchronous Data Link Control. This communications uses the Synchronous Data Link Control, in which the control station may be receiving from one tributary station while it is transmitting to a second tributary station. For this mode of operation, a duplex communications facility and a duplex line set at the 3704/3705 is required. Normal half-duplex or duplex communications facilities is also supported.
- The 3604 and 3614 can be featured with a loop integrated modem (#8001) for attachment to the 3600 System Controller via communication facilities. The 3604 and 3614 can provide a remote subloop for 3600 System terminals. The 3603 also provides a remote subloop and the interface to communication facilities.
- [5] See the SCP Programming pages for information on which intercommunications capability is supported by the 3704/3705 Emulation and Network Control Programs.
- [6] Appropriately configured 3271 mdl 11s and 12s, 3275 mdl 12s, 3601s, 3602s, 3631s, 3632s., 3651 mdl 50s, 3767s, 3771s, 3773s, 3774s, 3775s, 3776s, 3777 mdl 1s, 3791s, System/32s and System/34s may be intermixed as tributary stations on a multipoint non-switched line. All such intermixed stations and the control station must be operating with the same clocking source (either modem or business machine) and at the same transmission speed. The control station must be a S/370 with an attached 3704 or 3705.
- [7] Appropriately configured 3601s; 3602s, 3631s, 3632s, 3651 mdl 50s, 3684s, 3767s, 3771s, 3773s, 3774s, 3775s, 3776s, 3777s, 3791s, System/32s and System/34s may communicate over the public switched telephone network to the same SDLC line appearance on a 3704 or 3705 attached to a S/370. All DTEs so communicating must be operating with the same clocking source (either modem or business machine) and at the same transmission speed.
- [8] Communications between a 3767 (Start/Stop Mode) and 3704 or 3705 utilizing 1200 bps Integrated Modems is supported in VS using the appropriate level of EP and/or NCP. The same 3767 Start/Stop configurations are also supported in non VS systems except 2741 on two-wire facilities.
- [9] The 3276 mdl 12 may be attached as tributary stations on a multipoint or point-to-point non-switched line where the control station is a 3791 equipped with a Data Link Adapter (#3210 and/or #3211). All stations on such a line must operate at the same speed and use the same type clocking source, i.e., either modem or business machine clock.



CHART A

COMMON CARRIER PRIVATE LINE (NON-SWITCHED) TELEGRAPH CHANNELS

FACILITY A1 - Point-to-point or Multipoint Start-stop Operation @ 45.5 bps on a Type 1002 Channel (or equivalent). (1)

IBM Machine Type	2701	2702	2703	3115	3704
				3125	3705
Telegraph Line	7860	7911	7911	7881	4721
Adapter		9680	4873	9733	9601
		7895	7876	(2)	
			7897		
			(3)		

FACILITY A2 - Point-to-point or Multipoint Start-stop Operation @ 56.9 bps on a Type 1002 Channel (or equivalent). (1)

IBM Machine Type	2701	2702	2703	3115	3704
				3125	3705
Telegraph Line	7861	7911	7911	7881	4721
Adapter		9681	4874	9734	9602
		7895	7876	(2)	
			7897		
			(3)		

FACILITY A3 - Point-to-point or Multipoint Start-stop Operation @ 74.2 bps on a Type 1002 Channel (or equivalent). (1)

IBM Machine Type	2701	2702	2703	3115	3704
				3125	3705
Telegraph Line	7862	7911	7911	7881	4721
Adapter		9682	4875	9735	9603
		7895	7876	(2)	
			7897		
			(3)		

FACILITY A4 - Point-to-point or Multipoint Start-stop Operation @ 75 bps on a Type 1005 Channel (or equivalent).

IBM Machine Type	2702	2703	M2	2740	3115	3704
				3125	3705	
Telegraph Line	4615	4696	7807	7881	4721	
Adapter	9683	4876		9736	9604	
	7895	7876		(2)		
		7897				
		(3)				

NOTES FOR CHART A

1. The terminals on the A1 through A3 Facilities are Telephone Company Type 83B2 or 83B3 or Western Union Plan 115A terminals.
2. The 3115 and 3125 feature codes are for the attachment of the first communications line. See the M 3115 and M 3125 pages for additional line attachment feature codes.
3. The 2703 Line Set feature code (#7897) is for the attachment of up to eight communications lines. See the M 2703 pages for additional line attachment feature codes. When two 2703s are operated in series on the same telegraph channel, RPQ (no charge) must be installed on one 2703 and RPQ (no charge) must be installed on the other 2703. These RPQs are not required to operate two telegraph line appearances on the same 2703 in series on the same telegraph channel.

CHART C

PUBLIC SWITCHED NETWORKS (see Note 13)

FACILITY C1 - Start-stop Operation @ 300 bps on the Public Switched Telephone Network.

	3704	
IBM Machine Type	3705 3767	
1200 bps Integrated Modem	4782 7111	
	9612 or	
	7113,	
	9540	
	5502	
1200 bps Integrated Modem with Interrupt	4786 7113	
	9612 9540	
	5506	

FACILITY C1M - Start-stop Operation @ 134.5 bps or 300 bps on the Public Switched Telephone Network via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

			2740			3115			3704			3845		
IBM Machine Type	2701	2702	2703	M1	2741	3125	3135	3138	3705	3767	3792	3846	4331	CMCST
Interface to Stand-alone DCE	4640	4615	4696	3255	3255	1231	4640	4640	4711	7111	3701	(16)	1601	(4)
	9581	9684	4878	9114	9114	9739	9625	9721	or	or			4696	
		3233	3205					9721	(2)	4714,	7113,		3701	
			(3)			1241	(2)			9606	9540		968X	(19)
						9738				or	3719			
						(2,				9612	(15)			
						15)				(15)				
Interface to Stand-alone ACE (5)	1302	1290	1340			1291	1290	4715						
			(3)			(2)	9777							
							(2)							

FACILITY C2 - Start-stop Operation @ 110 bps, 134.5 bps or 150 bps on the TWX Network.

			2740			3115	3135	3704	3845	
IBM Machine Type	2701	2702	2703	M1	2741	3125	3138	3705	3846	CMCST
Interface to CPT-TWX Service @ 110 bps (6)	7885	7912	7912			1241	4640	4711	(16)	
		3233	4877			9737	9785	or		
			3205			(2)	(2)	4714,		
			(3)					9605		
Interface to CE-TWX Service @ 134.5 bps (6)	4640	4615	4696	3255	3255	1241		4711	(16)	(4)
	9581	9684	4878	9114	9114	9738		or		
		3233	3205			(2)		4714,		
			(3)					9606		
Interface to CPT-TWX Service @ 150 bps (6)								4711	(16)	
								or		
								4714,		
								9611		
Interface to Stand-alone ACE on the CE-TWX or CPT-TWX Services (5)	1302	1290	1340			1291		4715		
			(3)			(2)				

FACILITY C3 - Synchronous Operation @ 600 bps on the Public Switched Telephone Network.

	3704	
IBM Machine Type	3705 3767 4331	
1200 bps Integrated Modem	4782 9531 4782	
	9607 5502 or	
	(9)	4783,
		967X
		or
		969X,
		1601
		4696
		(19)

FACILITY C3M - Synchronous Operation @ 600 bps on the Public Switched Telephone Network via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

				3275				3845	
IBM Machine Type	3115	3135	3138	M2	3704	3705	3767	3846	4331
Interface to Stand-alone DCE	7141	4640	4640	3440	4714	4714	3719	(16,	1601
	(2)	9601	9649		9607	9607	9531	17)	4696
		9625	(2)		(9)	or	9619		3701
		9649				9615			967X
		(2)				(9)			or
									969X
									(19)
Interface to Stand-alone ACE (5)	1295	1290	1290		4715				
	(2)	9777	9777						
		(2)	(2)						



CHART C (cont'd)

FACILITY C4 - Synchronous Operation @ 1200 bps on the Public Switched Telephone Network.

IBM Machine Type	2701	3115 3275		3276		3661	3684	3704	3705	3735	3767	3771	3774	3791	8101
		3125	M2	M11-14	M11-14											8130
1200 bps Integrated Modem	4782	4782	5500 or 5501	5502 or 9490	5501	5530	4782 (9)	4782 (9)	5501	5502 9532	5501 or 5502	5501 or 6301	5501 or 6301	5501 or 6301	1601, 5501 (12)
1200 bps Integrated Modem with ACO Feature (7)	4782	4791						4709	4791						

FACILITY C4M - Synchronous Operation @ 1200 bps on the Public Switched Telephone Network via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	2701	2715		3115 3125		3275		3276		3601	3631	3661	3684	3704	3705	3735	8101
		2703	M2	M11-14	M11-14	M2	M11-14	M2	M11-14									8130
Interface to Stand-alone DCE	7698	7705	7705	7141 (2)	7141 (2)	4640	3440	3701	3701	3701	3701	3701	3701	4714	4714	7705	
	7692	7710 (8)	(3)			9625 (2)	9649	6301	6301	6301	9490			9608 (9)	9608 or 9615 (9)		
Interface to Stand-alone ACE (5)	1314	1340 (3)		1295 (2)	1295 (2)	1290	9777 (2)							4715	4715		
IBM Machine Type	3767	3771	3774	3780	3791	3845	8130										8140
Interface to Stand-alone DCE	3719	1482	1482	7705	3701	(16,	1601,										
	9532	3701	3701	9123	6301	17)	3701										
	9619			9402	(12)												
Interface to Stand-alone ACE (5)																	

FACILITY C5 - Synchronous Operation @ 2400 bps on the Public Switched Telephone Network.

IBM Machine Type	2701	2703	2715		3115 3125		3135		3276		3601	3631	3651	3651	3651	3669	3684	3704	8101
			M2	M11-14	M11-14	M11-14	M11-14	M11-14	M11-14	M11-14										8130
2400 bps Integrated Modem																(11)		4761 or 4771 (9,10)	
Interface to IBM 3872 Modem or IBM 3863 Modem	7698	7710	(4)	7151 (2)	7131 9758	4640 9609	4640 9609	3701 6302	4502 or	4502 or	9120	9120	9120				3701	4714 (9)	
	(8)	(3)			or 7151 (2)	9625 9649 (2)	9649 (2)	9490 (2)	6302, 9822	6302, 3701			6185						
Interface to ACO Feature (#1091) on IBM 3872 (7)	1314	1340 (2)		1295 (2)	1295 (2)	1290	1290	9777 (2)										4715	
IBM Machine Type	3705	3735	3767	3771	3776	3777	3777	3780	3791	3845								8101	
				M1,2	M3,4	M3	M1,2	M1,2	M1,2	3846	4331	8140						8130	
2400 bps Integrated Modem	4761	5610			5610		5610												
Interface to IBM 3872 Modem or IBM 3863 Modem	4714	(4)	3718	1481	1481	3701	1481	9120	3701	(16,	1601	1602,							
	(9)		9533	3701	3701		3701	9402	6302	17)	4695	3701							
			9619						or 6303 (12)		3701 967X or 969X (19)								
Interface to ACO Feature (#1091) on IBM 3872 (7)	4715																		



CHART C (cont'd)

FACILITY C5M - Synchronous Operation @ 2000 or 2400 bps on the Public Switched Telephone Network via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	2701 2703		2715		3115 3125		3135 3138		3276		3601 3631		3704		(cont'd below)
			M2	M2	3125	3135	3138	M11-	3602	3632	3684	3705	3735		
Interface to Stand-alone DCE	7698 (8)	7710 (3)	(4)	7151 (2)	7131 9758	4640 9609	4640 9609	9821 or 9625	4502 or 9649	4502 or 9822	3701 (18)	4714 (9)			
				7151 (2)	9649 (2)	9649 (2)	9821 (2)	3701	3701	6302, 6302, 6302					
Interface to Stand-alone ACE (5)	1314	1340 (3)		1295 (2)	1295 (2)	1290 9777	1290 9777						4715		

IBM Machine Type	3774, 3775, 3776 3776		M1,2 M3,4		3791 3845		8101					
	3767	3773	3777	3777	M1,2	M3	3780	M1,2	3846	4331	8140	8130
Interface to Stand-alone DCE	3718 9533 9619	1481 3701	1481 3701	3701	9120 9402	3701 6302	(16, 17)	1601 4695	1602, 3701			
					6303 (12)	967X or 969X (19)						

Interface to Stand-alone ACE (5)

FACILITY C6 - Synchronous Operation @ 4800 bps on the Public Switched Telephone Network.

IBM Machine Type	2701 2703		2715 3115		3135 3138		3276		3651		3704		3771, 3773		3776		(cont'd below)	
			M2	M2	3125	3135	3138	M11-	3602	3632	M50, M75	3684	3705	3735	3775	M1,2		M3	M1,2
4800 bps Integrated Modem															5710 (14)			
Interface to IBM 3874 Modem or IBM 3864 Modem	7698 (8)	7710 (3)	(4)	7151 (2)	4640 9609	4640 9609	3701 6302	4502 or 9625	4502 or 9649	9126 9490	3701 6302, 6302, 6302	4714 (9)	(4)	1481 3701	1481 3701	3701	1481	3701
Interface to ACO Feature (#1091) on IBM 3874	1314	1340 (3)		1295 (2)	1290 9777	1290 9777												

IBM Machine Type	3780 3791		3845		8101	
	3780	3791	3846	4331	8140	8130
4800 bps Integrated Modem						
Interface to IBM 3874 Modem or IBM 3864 Modem	9128 9402	3701 6303	(16, 17)	1601 4695	1602, 3701	
		(12)		3701 967X or 969X (19)		

Interface to ACO Feature (#1091) on IBM 3874

FACILITY C6M - Synchronous Operation @ 4800 bps on the Public Switched Telephone Network via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	2701 2703		2715 3115		3135 3138		3276		3601 3631		3704		3771, 3773, 3775, 3776, 3777		3776		(cont'd below)	
			M2	M2	3125	3135	3138	M11-	3602	3632	3684	3705	3735	3775	M1,2	M3		3780	3791
Interface to Stand-alone DCE	7698 (8)	7710 (3)	(4)	7151 (2)	4640 9609	4640 9609	3701 6302	4502 or 9625	4502 or 9649	3701 9490	4714 (9)	(4)	1481 3701	1481 3701	3701	9128 9402	3701	6303 (12)
Interface to Stand-alone ACE (5)	1314	1340 (3)		1295 (2)	1290 9777	1290 9777												

CHART C cont'd

	3845	8101	
		8130	
IBM Machine Type	3846	4331	8140
Interface to Stand-alone DCE	(16, 17)	1601 4695	1602 3701
		3701 967X	
		or	
		969X	
		(19)	
Interface to Stand-alone ACE (5)			

FACILITY C7 - Synchronous Operation @ 50 Kbps on the Switched Wideband Service.

IBM Machine Type	3704	3705
Interface to Stand-alone DCE	4717 (9)	4717 or 4725 (9)

NOTES FOR CHART C

2. The 3115, 3125, 3135 and 3138 feature codes listed are for the attachment of the first communications line. See the M 3115, M 3125 and M 3135 pages for additional line attachment feature codes.
3. The 2703 Line Set feature codes (#3205, #7710) and Autocall feature code (#1340) are for the attachment of up to eight start-stop communications lines, up to four synchronous communications lines or up to eight stand-alone ACEs. See the M 2703 pages for additional line attachment and additional ACE attachment feature codes.
4. No special feature is required to attach this DTE to this facility.
5. "ACE", Automatic Calling Equipment, refers to the unit which accepts dial digits from the DTE and presents them to the telephone central office.
6. CE-TWX (Customer Equipment - TWX) is a Service on which IBM DTEs may communicate with each other over the TWX network. CPT-TWX (Customer Provided Terminal - TWX) is a Service in which IBM multiplexers or CPU integrated communications adapters may communicate with common carrier provided TWX 33/35 or TWX 37 terminals over the TWX network.
7. "ACO", Automatic Call Originate, refers to the feature on the IBM 3872 and 3874 Modems and on the 1200 bps and 2400 bps Integrated Modems which permits automatic dialing (under program control) of a remote terminal. When this feature is installed, stand-alone ACEs are not required.
8. The 2701 feature code listed is for the attachment of a single synchronous communications line. See the description of the Dual Communication Interface feature in the M 2701 pages for the conditions under which a second synchronous communications line may be attached.
9. When a 3704 or 3705 is equipped with the Remote Program Loader feature (#6260), it may serve as a "Remote" and communicate with a "Local" 3704/3705. The primary communications link between them must be a non-switched facility. A secondary (alternate path) link may be employed, and may be either switched or non-switched. Therefore, communications between a 3704/3705 "Remote" and a 3704/3705 "Local" over this Facility is allowed only as a secondary (alternate path) link.
10. Feature code #4761 on the 3704 and 3705 provides one 2400 bps Integrated Modem for use on the Public Switched Telephone Network. Feature code #4771 on the 3704 and #4707 on the 3705 provide one 2400 bps Integrated Modem with an Automatic Call Originate feature for automatic dialing and communications over the Public Switched Telephone network.
11. The 2400 bps Integrated Modem is included as part of the basic 3669.
12. 3791 switched network operation is supported at the 3704/3705 by non-switched programming. Special procedures are required to establish and disconnect the links. Refer to the VTAM and 3790 operation instructions for the appropriate procedures.
13. Satisfactory data transmission cannot be achieved with all switched network voice services, specifically with those on which proper conditioning of the local loop is not available. For example, off-premise PBX extensions, tandem tie line networks, foreign exchange lines and WATS lines may present characteristics which are not suitable for data transmission. It is recommended that the installation of such a communications system be carefully planned with the common carrier.
14. The 4800 bps Integrated Modem (#5710) is line compatible and suitable for communications over this Facility with an IBM 3874 Modem equipped with feature code #7941, #7951 or #7952.
15. The 3767 terminal will communicate at 300 bps over this Facility with a 3115, 3125, 3704 or 3705. The speed specifies for this type operation are:
 - #9739 on the 3115 and 3125
 - #9612 on the 3704 and 3705
 - #9540 on the 3767.
16. No special feature is required to attach to this facility. Modems must satisfy EIA-RS-232C recommendations. The 3845 and 3846 will operate with DTEs operating at speeds of 110 bps or greater.
17. Feature #9110 required for BSC operation. Feature #9155 required for BSC with Business Machine Clock. The 3845 and 3846 will not operate with NRZI coded facilities.
18. The 3684 does not support 2000 bps operation.
19. Specify Codes #967X, #968X and #969X on the 4331 stipulate which protocol the 4331 is to communicate in, and which line position on the 4331 that protocol is to be applied to, with the "X" in each case being the line position.



CHART D

COMMON CARRIER PRIVATE LINE (NON-SWITCHED) SUB-VOICE OR VOICE GRADE CHANNELS

FACILITY D1 - Point-to-point or Multipoint Start-stop Operation @ 134.5 bps or 300 bps on a Half-duplex Type 3002 (or equivalent) Channel.

IBM Machine Type	2740	2741	3115	3704	3125	3705	3767	3792	3845	3846
Shared Line Adapter Ty 1A (Half-duplex) (1)	4641	4641							(27)	
	thru	thru								
	4644	4644								
Shared Line Adapter Ty 1B (Duplex) (1)	4691	4691							(27)	
	thru	thru								
	4694	4694								
Leased Line Adapter Ty 1A (Half-duplex) (1)	4639	4639	4743	4742				5400	(27)	
			(2)	9606				9652		
				(18)						
Leased Line Adapter Ty 1B (Duplex) (1)	4647	4647	4743	4743				5400	(27)	
			(2)	9606				9651		
				(18)						
1200 bps Integrated Modem (@ 300 bps) (1)			4781	4781	7111					
			1231	9612	or					
			9739		7113,					
			(2)		9540					
					5500					
1200 bps Integrated Modem w Interrupt (@ 300 bps) (1)			4785	7113						
			9612	9540						
				5505						

FACILITY D1M - Point-to-point or Multipoint Start-stop Operation @ 134.5 bps or 300 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	1071	2701	2702	2703	2740	2741	3115	3125	3135	3138	3704	3705	3767	3792	3845	3846	4331	8101	8130	8140
Interface to Telephone Co. Type 1006 Sub-voice Grade Service (3)		4640	4615	4696	9120	9120	1241				4711				(27)			1603,	3701	
		9581	9684	4878		(4)	9738				or									
			3233	3205			(2)				4714,									
				(5)							9606									
Interface to Western Union Type 1006 Sub-voice Grade Service (3)	9111	4640	4615	4696	9116	9116	1241				4711				(27)			1603,	3701	
		9581	9684	4878		(4)	9738				or									
			3233	3205			(2)				4714,									
				(5)							9606									
Interface to a Stand-alone DCE on a Voice Grade Channel	9110	4640	4615	4696	9115	9115	1231	4640	4640	4711	7111	3701	(27)	1601	1603,			1603,	3701	
		9581	9684	4878	or	or	9739	9721	9721	or	or			4696	3701					
			3233	3205	9120	9120	or	(2,	(2,	4714,	7113,			3701						
				(5)	(4)	(4)	1241	20)	20)	9606	9540			968X						
							9738			or	3719			(31)						
							(2,			9612	(20)									
							20)			(20)										

FACILITY D2 - Point-to-point or Multipoint Start-stop or Synchronous Operation @ 600 bps on a Half-duplex or Duplex Type 3002 (or equivalent) Channel.

IBM Machine Type	1031	2740	3115	3704	3845	8101	8130	8140
Leased Line Adapter Ty 1A, Start-stop (Half-duplex) (1)	1034	M2	3125	3705	3767	3846	4331	8140
		4639	4743	4742		(27,		
			(2)	9607		28)		
				(18)				
Leased Line Adapter Ty 1B, Start-stop (Duplex) (1)	4647	4647	4743	4743		(27,		
			(2)	9607		28)		
				(18)				
1200 bps Integrated Modem, Start-stop (1)			4781	4781	7112		1601	
			1231	9607	9541		4696	
			9739		5500		4781	
			(2)				968X	
							(31)	
1200 bps Integrated Modem, Synchronous (1)			4781	9531			1601	
			or	5500			or	
			4784,	(16)			1603,	
			9607				5500	
			(10,16)					



CHART D cont'd

FACILITY D2M - Point-to-point or Multipoint Start-stop or Synchronous Operation @ 600 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	1031		2740			3115			3845			8101			
	1034	1071	2701	2702	2703	M2	3125	3135	3138	3704	3705	3767	3846	4331	8140
Interface to Stand-alone DCE for Start-stop Operation (8)	2068	9110	4640 9582 or 4615	4616 or 4697	4696 or 4879	7106 9121	9739 or 9740	4640 9601 9721	4640 9721 (2)	4711 or 4714	4711 or 4714	7112 9541 3719	(27)	1601 4696 3701	1603 3701 968X (31)
Interface to Stand-alone DCE for Synchronous Operation (3)										4714 or 4718	4714 or 4718	9531 3719 (16)	(27, 28)	1601 4696 3701	1601 or 1603 3701 968X (31)

FACILITY D3 - Point-to-point or Multipoint Start-stop or Synchronous Operation @ 1200 bps on a Half-duplex or Duplex Type 3002 (or equivalent) Channel.

IBM Machine Type	3115		3275		3276		3601		3704			3771		3774		3791		(cont'd below)
	2701	3125	M2	M12	M1-4	M12	M1-4	3614	3603	3604	3684	3705	3735	3767	3773	3775	M1,2		4331
1200 bps Integrated Modem, Start-stop (1)			4781											7112				1601
		1231												9542				4696
		9739												5500				4781
		(2)																968X (31)
1200 bps Integrated Modem, Synchronous (1)	4781	4781	5500	5500	5500	5500	(15,	8001	5530	4781	5500	9532	5500	5500	5500	5500	1601	
		7141	7820	7820	9491	or	21)	or					5500	(16)	(16)	(16)	6301	
		(2)		(16)	9651	8001		8002		4784,		(16)				(16)	4781	
					or	(15,		(15)		(10,							967X	
					9652	16)				16)							3210	
					(16)												4781	
																	26)	
																	(31)	
IBM Machine Type	8101	8775																
	8130	M11,																
	8140	12																
1200 bps Integrated Modem, Start-stop (1)																		
1200 bps Integrated Modem, Synchronous (1)	1601	1488																
	or	5500																
	1603,																	
	5500																	

FACILITY D3M - Point-to-point or Multipoint Synchronous Operation @ 1200 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	2715		3115		3271			3271		3275		3275		3276		3601		3614		3631		(cont'd below)
	2701	2703	M2	3125	3135	3138	M1,2	12	M2	M12	M1-4	M1-4	3602	3624	3632	3684	3602	3624	3632	3684		
Interface to Stand-alone DCE for Synchronous Operation	7698	7705	7705	7141	4640	4640	7820	7820	7820	7820	3701	4501	3701	3701	3701	3701	6301	or	6301	6301	3701	
	7692	7710	(7)	(2)	9649	9649		(16)		(16)	6301	or	6301	6301	6301	6301	(16)	(16)	(16)	(16)		
	(2)	(7)	(5)		(2)	(2)					9491	6301,	(16)	3701	3701	3701	(16,	3701	3701	3701	3701	
											26)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	
IBM Machine Type	3704	3705	3735	3767	3771	3774	3791	3845	4331	8101	8775	8130	M11,									
Interface to Stand-alone DCE for Synchronous Operation	4714	4714	7705	9532	1482	1482	7705	3701	(27,	1601	1601	1488	or	3701	3701	1603,	3701	1603,	3701	1603,	3701	
	or	or	5010	3719	3701	3701	9122	6301	28)	4696	or	3701	3701	3701	3701	3701	3701	3701	3701	3701	3701	
	4718,	4718,		(16)	(16)	(16)		(16)		3701	1603,	3701	1603,	3701	1603,	3701	1603,	3701	1603,	3701	1603,	
	9608	9608						or	967X	3701	3701	3701	3701	3701	3701	3701	3701	3701	3701	3701	3701	
	(10,	or						3210														
	16)	9615						3703	968X													
		(10,16)						(26)	or													
									969X													
									(31)													



CHART D (cont'd)

FACILITY D4M - Point-to-point or Multipoint Synchronous Operation @ 2000 or 2400 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	2715					3271				3276							(cont'd below)
	2701	2703	M2	3115	3125	3135	M1,2	M11, 12	M1C	M2	M12	M11-4, 11-14	3601 3602	3603 M2	3614 3624		
Interface to Stand-alone DCE for Synchronous Operation	7698 (7)	7710 (5)	(6)	7151 (2)	7131 9758 or 7151 (2)	4640 9609 or 9649 (2)	(6)	(6, 16)	9821 or 9822, 3701 6302 (16)	(6)	(6, 16)	9821 or 9822, 3701 6302 (16)	4502 or 6302, 9491 (16, 26)	6352 or (21)	3701 6302 (16)		
IBM Machine Type	3631 3632	3684	3705	3735	3767	3773	3771 M1,2	3776 M3, 4	3777 M1,2	3780	3791 M1,2	3845 3846	4331	8101 8140	8775 M11, 12		
Interface to Stand-alone DCE for Synchronous Operation	4502 or 6302, 3701	3701 (30)	4714 or 4718 (10, 16, 32)	5010	9533 3718 (16)	1481 3701 (16)	1481 3701 (16)	3701 (32)	1481 3701 (16, 22)	9120	3701 or 6302 (27, 28)	3701 or 6303 (16)	3211 3703 (26)	1601 4695 or 3701 967X (31)	1602 or 1604, 3701	3701	

FACILITY D4SB - Point-to-point or Multipoint Synchronous Operation @ 2400 bps on a Type 3002 Channel (or equivalent) with Back-up @ 2400 bps or 1200 bps on the Public Switched Telephone Network.

IBM Machine Type	3271					3276							(cont'd below)	
	2701	2703	3115	3125	M1,2	M11, 12	M1C	M2	M12	M11-4, 11-14	3631 3632	3651 M50		3704 3684	3735
2400 bps Integrated Modem (11)														5600 or 5602, 7951 (24)
Interface to IBM 3872 Modem (9, 12) or IBM 3863 Modem (33)	7698 (7)	7710 (5)	7151 (2)	7131 9758 or 7151 (2)	(6)	(6, 16)	3701 6302 or 9822 (16)	(6)	(6, 16)	3701 6302 or 9491 9822 (16, 26)	4502 or 6302, 9121 9122 (16)	3701 or 6303 (16)	3701 4714 5010	
IBM Machine Type	3771 3773	3776 M1,2	3777 M3	3777 M1,2	3780	3791 M1,2	3842	3845 3846	4331	8101 8130 8140				
2400 bps Integrated Modem (11)														5600 or 1461 or 5602, 1462, 7951 (25)
Interface to IBM 3872 Modem (9, 12) or IBM 3863 Modem (33)	1461 or 1481 3701	1461 or 1481 3701	3701	1461 1481 3701 (22)	9125 9402 (26)	3211 3703 (26)	(27, 28)	1601 4695 or 3701 967X or 969X (31)	1602 or 3701					

FACILITY D5 - Point-to-point or Multipoint Synchronous Operation @ 4800 bps on a Duplex Type 3002 Channel (or equivalent) (C1 conditioning required for the IBM 3874 Modem).

IBM Machine Type	2715					3271				3276			(cont'd below)
	2701	2703	M2	3115	3125	3135	3138	M1,2	M11, 12	M1C	M2	M12		M11-4, 11-14
4800 bps Integrated Modem (19)													
Interface to IBM 3874 Modem (9) or IBM 3864 Modem	7698 (7)	7710 (5)	(6)	7151 (2)	7131 9758 or 7151 (2)	4640 9609 or 9649 (2)	4640 9649 (2)	7821	(6, 16)	3701 6302 or 9823 (16)	7821 (6, 16)	3701 or 6302, 9491 9823 (16, 26)	



CHART D (cont'd)

IBM Machine Type	3601 3602	3614 3624	3631 3632	3651 M25, M50,	3704 3705	3735	3771, 3773, 3774, 3776	3775	3776 M3,4	3777	3780	3791	3845 3846	4331	8101 8140	8775 M11, 12
4800 bps Integrated Modem (19)										5700 or 5702						
Interface to IBM 3874 Modem (9) or IBM 3864 Modem	4502 or 6302, 3701 (16)	3701 6302 (16)	4502 or 6302, 3701 (16)	9124 or 9125	3701 or 4718 (10, 16, 32)	4714 5010	1481 1481 3701 (16)	1481 3701 (16)	3701 (32)	1481 9124 3701 (16, 22)	9124 9402	3701 6303 (16)	(27, 28)	1601 4695 3701 967X 3211 3703 (26)	1602 or 1604, 3701 or 969X (31)	3701

FACILITY D5M - Point-to-point or Multipoint Synchronous Operation @ 4800 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	2701	2703	2715 M2	3115	3125	3135	3271 M1,2	3271 M11, 12	3274 M1C	3275 M2	3275 M12	3276 M1-4, 11-14 below)			
Interface to Stand-alone DCE	7698 (7)	7710 (5)	(6)	7151 (2)	7131 9758 or 7151 (2)	4640 9609 9649 (2)	7821 (6, 16)	3701 (16)	7821 9823 (16)	3701 (6)	3701 6302 (16)	3701 9491 9823 (16, 26)			
IBM Machine Type	3601 3602	3614 3624	3631 3632	3704 3705	3735	3771 3773	3774, 3776 3775, M3,4	3777	3777	3780	3791	3845 3846	4331	8101 8140	8775 M11, 12
Interface to Stand-alone DCE	4502 or 6302, 3701 (16)	3701 3602 (16)	4502 or 6302, 3701 (16)	4714 or 4718 (10, 16, 32)	5010	1481 (16)	1481 3701 (16)	3701 (32)	1481 3701 (16, 22)	9124	3701 6303 (16)	(27, 28)	1601 4695 3701 967X 3211 3703 (26)	1602 or 1604, 3701 or 969X (31)	3701

FACILITY D5SB - Point-to-point or Multipoint Synchronous Operation @ 4800 bps on a Duplex Type 3002 Channel (or equivalent) (C1 conditioning required for the IBM 3874 Modem) with Back-up @ 4800 bps or 2400 bps on the Public Switched Telephone Network.

IBM Machine Type	2701	2703	3115	3125	3271 M1,2	3271 M11, 12	3274 mdl 1C	3275 M2	3275 M12	3276 M1-4, 11-14	3631	3651 M50	3704 3684	3705	3735	3771 3773	3774 3775	(cont'd below)	
4800 bps Integrated Modem (26)																			
Interface to IBM 3874 Modem (9, 12) or IBM 3864 Modem (33)	7698 (7)	7710 (5)	7151 (2)	7131 9758 or 7151 (2)	7821 (6)	3701 6302 9823 (16)	7821 (6)	3701 6302 9491 9823 (16, 26)	3701 6302 (16)	4502 9124 3701 (16, 16)	9124 or	3631 or	3704 3701 967X 3211 3703 (26)	4714	5010	1461 or 1462, 1481 3701 (22)	1461 or 1462, 1481 3701 (22)	1461 or 1481 3701 (31)	
IBM Machine Type	3776 M1,2	3777 M3	3777 M1,2	3780	3791 M1,2	3845 3846	4331	8101 8130 8140											
4800 Integrated Modem (26)	5700 1461 or 5702 1462, 7951																		
Interface to IBM 3874 Modem (9, 12) or IBM 3864 Modem (33)	1461 or 1462, 1481 3701	3701	1461 or 1462, 1481 3701 (22)	9129 9402 (26)	3211 3703 (28)	(27, 28)	1601 4695 3701 967X or 969X (31)	1602 or 1604, 3701 or 969X (31)											



CHART D (cont'd)

FACILITY D6 - Point-to-point or Multipoint Synchronous Operation @ 7200 bps on a Duplex Type 3002 with C2 Conditioning (or equivalent) Channel.

IBM Machine Type	2701	3115	3125	3135	3138	3271					3276					3776			(cont'd below)		
						M1,2	M11,	M1C	M2	M12	M1-4,	3601	3631	3704	M3,4	3777	3777	M1,2		3780	
Interface to IBM	7898	7151	7131	4640	4640	7821	(6)	3701	7821	(6)	3701	3701	3701	4714	3701	1481	9126				
3875 Modem (9)	(7)	(2)	9759	9609	9649			6302			6302	4502	4502	or	(16,	3701	9402				
			7151	(2)				9824	(16)		9824	(16)	(16)	4718	(32)	(16,					
			(2)								(16,			(10,		16,					
											29)			32)							

IBM Machine Type	3791	3845		8101		8775	
		3846	4331	8130	M11,	8140	12
Interface to IBM	3701	(27,	1601	1602	3701		
3875 Modem (9)	6303	28)	4695	or			
			3701	1604,			
	3703		967X	3701			
	3211		or				
	(16,		969X				
	29)		(31)				

FACILITY D6M - Point-to-point or Multipoint Synchronous Operation @ 7200 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	2701	3115	3125	3135	3138	3271					3276					3776			(cont'd below)		
						M1,2	M11,	M1C	M2	M12	M1-4,	3601	3631	3704	M3,4	3777	3777	M1,2		3780	
Interface to Stand-alone DCE	7898	7151	7131	4640	4640	7821	(6)	3701	7821	(6)	3701	3701	3701	4714	3701	1481	9126				
	(7)	(2)	9759	9609	9649			6302			6302	4502	4502	or	(16,	3701	9402				
			7151	(2)				9824	(16)		9824	(16)	(16)	4718	(32)	(16,					
			(2)								(16,			(10,		16,					
											29)			32)							

IBM Machine Type	3791	3845		8101		8775	
		3846	4331	8130	M11,	8140	12
Interface to Stand-alone DCE	3701	(27,	1601	1602	3701		
	6303	28)	4695	or			
			3701	1604,			
	3703		967X	3701			
	3211		or				
	(16,		969X				
	29)		(31)				

FACILITY D6SB - Point-to-point or Multipoint Synchronous Operation @ 7200 bps on a Duplex Type 3002 with C2 Conditioning (or equivalent) Channel with Back-up @ 3600 bps on the Public Switched Telephone Network.

IBM Machine Type	2701	3115	3125	3271		3274	3275	3275	3276			3776			8101		
				M1,2	M11,				M1C	M2	M12	M1-4,	3631	3704	3777	3777	3845	8130
Interface to IBM	7898	7151	7131	7821	(6)	3701	7821	(6)	3701	3701	4714	3701	1461	9127	(27,	1601	1602
3875 Modem (9, 12)	(7)	(2)	9759			6302			6302	4502			or	9402	28)	4695	or
			7151			9824			9491	(16)			1462,			3701	1604,
			(2)			(16)			9824				1481			967X	3701
									(16)				3701			or	
													(22)			969X	
																(31)	

FACILITY D7 - Point-to-point or Multipoint Synchronous operation @ 9600 bps on a duplex Type 3002 Channel (or equivalent).

IBM Machine Type	3271		3275		3276		3601	3631	3704	3776		3791	8101	
	M11,	M1C	M11,	M1-4	M11-	M3,				M1,2	3845		8130	
Interface to IBM	(6,	6302	(6,	3701	3701	3701	3701	4714	3701	1481	3701	(28)	1602	
3865 Modem (34)	16)	or	16)	6302	6302	4502	4502	or	(16)	3701	6303		or	
		6303,		6315	9491	(16)	(16)	4718		(16)			1604,	
		3701		9491	9825			(10,			3703		3701	
		9825		9825	(16)			16)			3211,		(16)	
		(16)									(16,			
											27)			

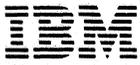


CHART D (cont'd)

FACILITY D7M - Point-to-point or Multipoint Synchronous Operation @ 9600 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	3271		3275		3276		3776		3777		3845		8101		8775		
	M11, 12	M1C	M12	M1-4	M11, 14	M11, 14	M3,4	M3	M1,2	3791	3846	4331	8130	M11, 12	8140	12	
Interface to Stand-alone DCE	(6, 16)	6302 or 6303, 3701 9825 (16)	(6, 16) 6302 6302, 6315 9491 9825 (16)	3701 3701 6302 6302, 6315 9491 9825 (16)	3701 3701 6302 6302, 6315 9491 9825 (16)	3701 3701 4502 4502 (16)	3701 3701 4714 4718 (16)	3701 3701 4714 4718 (16)	1481 (32)	3701 1481 (16, 22)	3701 6303 28)	1601 4695 3701 967X or 969X (31)	1602 1604, 3701				

FACILITY D7SB - Point-to-point or Multipoint synchronous operation @ 9600 bps on a duplex Type 3002 Channel (or equivalent) with Back-up on the Public Switched Telephone Network.

IBM Machine Type	3271		3275		3276		3776		3777		3845		8101	
	M11, 12	M1C	M12	M1-4	M11, 14	M11, 14	M3,4	M3	M1,2	3791	3846	8140	8130	8140
Interface to IBM 3865 Modem (33, 34)	(6, 16)	6302 or 6303, 3701 9825 (16)	(6, 16) 6302 6302, 6315 9491 9825 (16)	3701 3701 6302 6302, 6315 9491 9825 (16)	3701 3701 6302 6302, 6315 9491 9825 (16)	3701 3701 4714 4718 (16)	3701 3701 4714 4718 (16)	1481 (16)	3701 1481 (16)	3701 6303 (16)	1602 1604, 3701 (16)			

NOTES FOR CHART D

- IBM Line Adapters and Integrated modems perform the modulation/demodulation function on a communications facility at speeds up to 4800 bps. When they are used, stand-alone DCEs are not required. SRL GA24-3435 is your best source of information on the IBM Line Adapters and Integrated Modems.
- The 3115, 3125 and 3135 feature codes listed are for the attachment of the first communications line. See the M 3115, M 3125, 3135 and pages for additional line attachment feature codes.
- When used on a Voice Grade Channel, #9120 on the 2740 will operate in a point-to-point mode only. The 2741 terminal will operate in a point-to-point mode only on any facility.
- The 2703 Line Set feature codes (#3205, #7710) are for the attachment of up to eight start-stop or up to four synchronous communications lines. See the M 2703 pages for additional line attachment feature codes.
- No special feature code is required to attach this DTE to this Facility.
- The listed feature codes are for the attachment of a single synchronous communications line. See the description of the Dual Communication Interface feature in the M 2701 and M 2715 pages for the condition under which a second synchronous communications line may be attached.
- Refer to the M 3872, 3874 and 3875 pages for the DTE attachment feature codes required for each attaching DTE.
- 3704/3705 "Remotes" may communicate with 3704/3705 "Locals", point-to-point only, over this facility as their primary communications link. Feature codes #4714, #4751 and #4781 will support data-half-duplex operation over half-duplex or duplex communications facilities. Feature codes #4718, #4754 and #4784 will support data-full-duplex operation (i.e., simultaneous data transmission in both directions) over duplex facilities only.
- The 2400 bps Integrated Modem and the IBM 3659 Remote Communications Unit are line compatible and suitable for communications with the IBM 3872 Modem, properly equipped. #4751 or #5700 Integrated Modems require that the 3872 be equipped with #6101 or #6102. #4752 Integrated Modems require that the 3872 be equipped with #5101 or #5102. #5602 Integrated Modems are compatible with the basic (control station) 3872. The 3659 mdl 1 requires that the 3872 be equipped with #6101 or #6102. The 3659 mdl 2 requires that the 3872 be a basic control station (no special features) or equipped with #6302.
- The IBM 3872, 3874 and 3875 Modems must be equipped with #7951 or #7952 to operate on a switched network back-up link, except that the control station may operate over this type of link via separate ports, each of which is equipped with a 3872, 3874 or 3875 Modem.
- The 3604 (when equipped with #8001 or #8002), 3614 and 3624 (when equipped with #8001) and the 3603 will communicate with a 3601 or 3602 equipped with #8001 over a normal 3600 System "loop." When more than one 3603, 3604, 3614 or 3624 is on the loop, half-duplex, point-to-point, 2-wire terminated lines are required from the 3601 or 3602 to the first station on the loop, between successive stations on the loop and from the last station on the loop back to the 3601 or 3602. When only one station is on the loop, a duplex, point-to-point, 4-wire terminated line is required between it and the 3601 or 3602. The 3601, 3602, 3614 and 3624, when equipped with #5500, will communicate with a 3704 or 3705 over non-switched voice grade lines either point-to-point or multipoint. See Note 16 following.
- The 3271 mdls 11 and 12, 3274 mdl 1C, 3275 mdl 12, 3276, 3601, 3602, 3614, 3624, 3631, 3632, 3651 mdl 50, 3767, 3771, 3773, 3774, 3775, 3776, 3777, 3791, 5320, 5340 and Series/1 will communicate as tributary stations in a multipoint network with a control station 3704 or 3705 using Synchronous Data Link Control (SDLC). SDLC allows the control station to receive from one tributary station while it is transmitting to another tributary station. Operation in this mode requires that the 3704/3705 be equipped with one of the following:
 - #4784 for communications with a tributary station equipped with a 1200 bps Integrated Modem, or
 - #4755 for communications with a tributary station equipped with a 2400 bps Integrated Modem or attaching an IBM 3872 modem, or
 - #4718 for communications with a tributary station via stand-alone DCEs.
 Duplex communications facilities are required for this mode of operation. SDLC also supports the normal data-half-duplex mode of operation over half-duplex or duplex communications facilities.
- The 3651 Model 50 will communicate over this Facility with a 3704 or 3705 at the host System/370, or with a 3659 at a remote store site. Communications with the 3704/3705 requires #9121 or #9122. Communications with the 3659 requires #6111. The 3659 at the remote store site includes a 2400 bps Integrated Modem as part of the basic unit. Point-to-point remote communications loop requires the 3659 mdl 1. Multipoint remote communications loop requires the 3659 mdl 2.
- Leased Line Adapters are available as features on the 3704 or 3705 as noted. However, additional Leased Line Adapters may be attached via the 2711 Line Adapter Unit. The 3704/3705 feature code for each pair of lines so attached is either #4711 or #4714.



CHART D (cont'd)

19. The 4800 bps Integrated Modem, Point-to-point (#5700), is line compatible and suitable for communications with an IBM 3874 Modem equipped with the Point-to-point feature (#6101). The 4800 bps Integrated Modem, Multipoint (#5702), is line compatible and suitable for communications with an IBM 3874 Modem equipped with the Multipoint Control feature (#5100).
20. The 3767 terminal will communicate over this Facility at 300 bps with a 3115, 3125, 3135,, 3138 3704 or 3705. The speed specifies for this operation are:
 - #9739 on the 3115 and 3125
 - #9593 on the 3135
 - #9612 on the 3704 and 3705
 - #9540 on the 3767.
 - None on the 3138 where the speed is customer selectable.
21. The 3603 mdl 1 includes a 1200 bps Integrated Modem which is line compatible and suitable for communications with the 3601's or 3602's 1200 bps Loop Integrated Modem (#8001). The 3603 mdl 2 can provide an EIA/CCITT interface between a modem and a subloop of terminals or between a modem and a 3600 system controller. Special feature #6352 provides transmit signal element timing to a synchronous modem.
22. The 3777 mdl 2 operates in point-to-point mode only.
23. Features #4751 and #4754 on the 3705 require an RPQ.
24. Features #5600 and #5602 on the 3735 require an RPQ.
25. Features #5600 and #5602 on the 3780 require an RPQ.
26. Communication over this facility is between a 3276 operating as a multipoint or point-to-point tributary station and the 3791 (with #3210 and/or #3211 and/or #3703 and/or #4781) operating as a multipoint control station.
27. No special feature is required to attach to this facility. Modems must satisfy EIA-RS-232C recommendations. The 3845 and 3846 will operate with DTEs operating at speeds of 110 bps or greater.
28. Feature #9110 required for BSC operation. Feature #9115 required for BSC with Business Machine Clock. The 3845 and 3846 will not operate with NRZI coded facilities.
29. The 3276 may be attached as a tributary station on a multipoint non-switched line where the control station is a 3791 equipped with a Data Link Adapter (#3210 or #3211). All stations on such a line must operate at the same speed and use the same type clocking source, i.e., either modem or business machine clocking.
30. The 3684 does not support 2,000 bps operation.
31. Specify Codes #967X, #968X and #969X on the 4331 stipulate which protocol the 4331 is to communicate in, and which line position on the 4331 that protocol is to be applied to, with the 'X' in each case being the line position.
32. The 3705 using #4718 can communicate in duplex data communication mode (i.e., data transmission in both directions simultaneously) with the 3776-3,-4, 3777-3 over duplex communications facilities.
33. To operate on these switched network back-up facilities, the IBM 3863, 3864 and 3865 Modems must be equipped with feature #7953.
34. The IBM 3865 Modem will generally operate satisfactorily on a common carrier supplied unconditioned type 3002 non-switched voice band channel (or equivalent). However, in some cases the 3865 mdl 1 modem may require D1 conditioning on the channel and the 3865 mdl 2 modem may require either C1 or D2 conditioning on the channel. See M 3865 pages for details.



CHART E

COMMON CARRIER PRIVATE LINE (NON-SWITCHED) WIDEBAND CHANNELS

FACILITY E1 - Point-to-point Synchronous Operation @ 19.2 Kbps on a Wideband Channel.

IBM Machine Type	3115				3776	3777
	2701	3125	3704	3705	M3	M1,2
Interface to Type	7697	7121	4717	4717	4501	1481
5703 Service	(2)	(3)	(4)	or	4501	
				4725		(5)
				(4, 5)		
Interface to Type	7697	7121	4717	4717	4501	1481
8803 Service	(2)	(3)	(4)	or	4501	
				4725		(5)
				(4, 5)		

FACILITY E2 - Point-to-point Synchronous Operation @ 40.8 Kbps on a Wideband Channel.

IBM Machine Type	3115			
	2701	3125	3704	3705
Interface to Type	7697	7121	4717	4717
5701 Service	(2)	(3)	(4)	or
				4725
				(4)
Interface to Type	7697	7121	4717	4717
8801 Service	(2)	(3)	(4)	or
				4725
				(4)

FACILITY E3 - Point-to-point Synchronous Operation @ 50 Kbps on a Wideband Channel.

IBM Machine Type	3115			
	2701	3125	3704	3705
Interface to Type	7697	7121	4717	4717
5701 Service	(2)	(3)	(4)	or
				4725
				(4)
Interface to Type	7697	7121	4717	4717
8801 Service	(2)	(3)	(4)	or
				4725
				(4)

FACILITY E4 - Point-to-point Synchronous Operation @ 230.4 Kbps on a Wideband Channel.

IBM Machine Type	2701	3705
	Interface to Type	7697	4722
5751 Service	(2)	or
		4723
		(4)

NOTES FOR CHART E

2. This feature code is for the attachment of a single synchronous communications line. See the Dual Communications Interface feature description in the M 2701 pages for the conditions under which a second synchronous communications line may be attached.
3. A communications line attached to the ICA via this feature will present a 100% load factor to the ICA, and must not be operated simultaneously with any other line on the ICA.
4. 3704/3705 "Remotes" may communicate over this facility with 3704/3705 "Locals" point-to-point only as their primary communications link. #4717 or #4722 will support data half-duplex operation over half-duplex facilities, while #4725 or #4723 will support data full-duplex (i.e., simultaneous data transmission in both directions) over duplex facilities.
5. The 3705 using #4725 can communicate in duplex data communication mode (i.e., data transmission in both directions simultaneously) with the 3776-3,-4, 3777-3 over duplex communications facilities.



CHART G

CUSTOMER OWNED AND MAINTAINED (COAM) LIMITED DISTANCE FACILITIES

FACILITY G1 - Point-to-point or Multipoint Start-stop Operation @ 134.5 bps on a Customer Owned and Maintained Line up to 4.75 wire miles in length.

IBM Machine Type	2702	2703	2740	2741	3704	3705	3845	3846
Limited Distance	4634	4686	4634	4634	4731	(7)		
Line Adapter, Ty 1A, Half-duplex	9684	4878		(5)	9606			
Limited Distance	4635	4687	4635	4635	4732	(7)		
Line Adapter, Ty 1B, Duplex	9684	4878		(5)	9606			

FACILITY G2 - Point-to-point or Multipoint Start-stop Operation @ 134.5 bps or 600 bps on a Customer Owned and Maintained Line up to 8 wire miles in length.

IBM Machine Type	1031A1071	2701	2702	2703	2740	2741	3704	3705	3845	3846
Limited Distance		4792	4636	4612	4688	4790	4790	4741	(7)	
Line Adapter, Ty 2A @ 134.5 bps		9112		9684	4878	(3)	(1,3)	(5)	9606	(3)
Limited Distance	(4)	4792	4637	4613	4688	4790		4741	(7)	
Line Adapter, Ty 2A @ 600 bps		9112		9685	4879	(3)	(1,3)	(6)	9607	(3)

NOTES FOR CHART G

1. The 2703 feature codes listed are for the attachment of up to eight communications lines. See the M 2703 pages for additional line attachment feature codes.
3. Type 2 Limited Distance Line Adapters are available as features on the 2702, 2703, 3704 and 3705. However, when the maximum number of line adapters is reached on these machines, additional line adapters may be attached via the 2711 Line Adapter Unit. The 2702 feature code required for each line so attached is #3233. The 2703 feature code required for each group of up to eight lines so attached is #3205 or #3206. The 3704 and 3705 feature code required for each pair of lines so attached is #4711 or #4714.
4. The Limited Distance Line Adapter, Type 2, is included as part of the basic 1031A, unless the IBM Line Adapter, #4647, is ordered.
5. This DTE will operate on this Facility in point-to-point mode only.
6. This entry applies to the 2740 Model 2 only.
7. No special feature is required to attach to this facility. Modems must satisfy EIA-RS-232C recommendations. The 3845 and 3846 will operate with DTEs operating at speeds of 110 bps or greater.

CHART H

PARALLEL TRANSMISSION

FACILITY H1 - Parallel Transmission @13 cps on the Public Switched Telephone Network or on a Non-switched Voice Grade Line via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	1001	7770
Interface to Stand-alone DCE	(2)	(2)

NOTES FOR CHART H

2. No special feature is required to attach this DTE to this Facility.



CHART X (cont'd)

FACILITY X3 - Point-to-point or Multipoint Synchronous Operation @ 9600 bps.

IBM Machine Type	3276		3776		8101	8775
	3274 M1C	M11-14	M3-3777	4331	8130 M11, 8140	M11, 12
Interface to AT&T Dataphone *	5650	5650	5650	1601	1602	5650
Digital Data Service	5651	5651	5651	5650	1604, 5651	
	6302	6302	9825	967X	5660	9825
		or 9825	(15)	or		
	6303	(5)		969X		
	9825			(13)		

FACILITY X3M - Point-to-point or Multipoint Synchronous Operation @ 9600 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	3276		3776		3776		3776		3845		8101	8775
	3274 M1C	3276 M1-4	M11-14	3601 3602	3631 3632	3704 3705	3777 M1,2	M3 3777	3791 3846	4331	8130 M11, 8140	M11, 12
Interface to Stand-alone DCE	6302	3701	3701	3701	3701	4714	1481	3701	3701 (10, 11)	1601	1602	3701
	or 6302, 6303, 3701, 9825	6302, 6315, 9491, 9825	4502, 9491, (5)	4502, (5)	4718 (5,8)	or 3701 (14), (5,6), 14)	3703	3703	6303 (11), or 3701, 3701	4695	or 1604, 3701	967X
	9825 (5)	9825 (5)	(5, 12)				3211 (5,	or 969X				12), (13)

FACILITY X4 - Synchronous operation at 56,000 bps on public non-switched data network via integrated DCEs.

IBM Machine Type	4331	8101 8140
Interface to Stand-alone DCE	1601	1602
	4695	5660
	5650	
	9444	
	967X	
	or	
	969X	
	(13)	

FACILITY X4M - Point-to-point Synchronous Operation @ 56 Kbps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type	3705	4331	8101 8140
Interface to Stand-alone DCE	4720	1601	1602,
	or 4726	4695	1550
	(6)	967X	
		or	
		969X	
		(13)	

NOTES FOR CHART X

- The listed feature codes are for the attachment of a single synchronous communications line. See the description of the Dual Communication Interface feature in the M 2701 pages for the conditions under which a second synchronous communications line may be attached.
- No special feature is required to attach this DTE to this Facility.
- The 3115, 3125, 3135 and 3138 feature codes listed are for the attachment of the first communications line. See the M 3115, M 3125 and M 3135 pages for additional line attachment feature codes.
- The 3271 mdls 11 and 12, 3274 mdl 1C, 3275 mdl 12, 3276, 3601, 3602, 3614, 3624, 3631, 3632, 3767, 3771, 3773, 3774, 3775, 3776, 3777, 3791, 5320, 5340 and Series/1 will communicate as tributary stations in a multipoint network with a control station 3704 or 3705 using Synchronous Data Link Control (SDLC). SDLC allows the control station to receive from one tributary station while it is transmitting to another tributary station. Operation in this mode requires that the 3704/3705 be equipped with feature #4718. SDLC also supports the normal data-half-duplex mode of operation.
- 3704/3705 "Remotes" may communicate over this Facility with 3704/3705 "Locals" point-to-point only as their primary communications link. Feature code #4714 will support data-half-duplex operation over half-duplex or duplex facilities, while feature code #4718 will support data-full-duplex (i.e., simultaneous data transmission in both directions) over duplex facilities.
- The 3777 mdl 2 operates in point-to-point mode only.
- Communication over this facility is between a 3276 operating as a multipoint or point-to-point tributary station and a 3791 (with #3211 and #3703) operating as a multipoint control station.
- No special feature is required to attach to this facility. Modems must satisfy EIA-RS-232C recommendations. The 3845 and 3846 will operate with DTEs operating at speeds of 110 bps or greater.
- Feature #9110 required for BSC operation. Feature #9115 required for BSC with Business Machine Clock. The 3845 and 3846 will not operate with NRZI coded facilities.

* Trademark of AT&T.

**CHART X** (cont'd)

12. The 3276 may be attached as a tributary station on a multipoint non-switched line where the control station is a 3791 equipped with a Data Link Adapter (#3211). All stations on such a line must operate at the same speed.
13. Specify Codes #967X, #968X and #969X on the 4331 stipulate which protocol the 4331 is to communicate in, and which line position that protocol is to be applied to, with the "X" in each case being the line position.
14. The 3705 using #4718 can communicate in duplex data communication mode (i.e., data transmission in both directions simultaneously) with the 3776-3,-4, 3777-3 over duplex communications facilities.
15. The 3776-3,-4, 3777-3 can communicate in duplex data communication mode (i.e., data transmission in both directions simultaneously) over duplex communications facilities.



DP Machines

**OPD COMMUNICATING MAG CARD
"SELECTRIC" TYPEWRITER**

M 2700.99
Jul 79

Note: The byte structure of the standard "Selectric" character set differs from that for PTTC/BCD or PTTC/EBCD character sets.

Purpose: A communicating version of the OPD Mag Card "Selectric" to satisfy the need for incidental communications in the power typing environment. May be used to communicate with another like machine or as a terminal.

Highlights: The Mag Card "Selectric" uses a new I/O, a read/write unit and a Mag Card console housing the electronics. The mag card itself consists of 50 tracks of 100 characters each. The line expansion feature permits recording of 30-35 characters beyond the normal writing line of 65-70 characters. All functional controls and code keys for local and communications mode are provided on the keyboard of the "Selectric" I/O. The communications control includes a "Start" key for initiating transmission to a like machine, "Attention" key, a "CPU" key for initiating transmission to a computer, and a "Line Hold" key for maintaining communications when not transmitting or receiving.

Includes character format checking, dual velocity printing, send and receive indicator lights and a choice of a fabric or film ribbon. Print quality is exactly equivalent to that of a Mag Card "Selectric" Typewriter.

Magnetic cards prepared offline on any Mag Card "Selectric" may be transmitted at 135 baud. Sending and receiving may also take place directly from the keyboard.

The Standard Communicating Mag Card "Selectric" Typewriter is functionally equivalent online to a 2741 Communications Terminal equipped with the following features: Dial Up (#3255), Switched Network Attachment (#9114), Receive Interrupt (#4708), Typematic Keys (#8341) and Transmit Interrupt (#7900).

Code and systems compatibility provide for transmission to or from a suitably equipped S/360 mdl 22 thru 85 and 195, or a S/370 mdl 125 thru 195. See *Prerequisites* below.

Communications Facilities: The unit operates in half-duplex data, full duplex control mode over Common Carrier Public Switched Facilities (C1) at 134.5 bps.

PREREQUISITES: Communicates with a S/360 mdl 22 thru 85 and 195, or any S/370 Processor except 3115. The data processing system requires a 2701 Data Adapter Unit or a 2702 or 2703 Transmission Control.

Via 2701 The 2701 requires an IBM Terminal Adapter Type I (#4640) and Speed Selection (#9581). *Limitation:* The Receive and Transmit Interrupt features on this unit will not be recognized when communication is via a 2701.

Via 2702 The 2702 requires IBM Terminal Control Base (#9696), IBM Terminal Control-Type I (#4615), Selective Speed (#9684), and Data Set Line Adapter (#3233). *Note:* Type I Terminal Interrupt (#8200), when installed on the 2702, will allow the Transmit and Receive Interrupt features of this unit to be recognized. The 2741 Break (#8055) on the 2702 will allow only the Transmit Interrupt feature of this unit to be recognized.

Via 2703 The 2703 requires either Start-Stop Base Type I (#7505) or Type II (#7506), IBM Terminal Control Base (#4619), IBM Terminal Control Type I (#4696), Line Speed Option (#4878), and Data Line Set (#3205). *Note:* Type I Terminal Interrupt (#8200) will allow the Transmit and Receive Interrupt capability of this unit to be recognized. 2741 Break (#8055) will allow only the Transmit Interrupt feature of this unit to be recognized.

Customer Responsibilities: The customer must be advised that: [1] He is responsible for making arrangements for price quotations, installation and cost (initial and recurring) of common carrier communications facilities/services ... [2] Toll charges, if required for installation and maintenance of the IBM equipment, are to be paid by the customer ... [3] The customer must be prepared to relinquish the data processing system for service in those cases in which servicing aids or available error message printouts do not permit localization of a malfunction of the communications facility or terminal location.

Manuals: Communicating Mag Card Reference Manual, G543-0608 ... Communicating Mag Card Users Guide, G543-0609 ... Communicating Mag Card Program Supplement Sheets, G543-0610.

Specify: [1] Voltage ... 115 VAC, 60 Hz, 15 amps, 3-wire cord only.

[2] Typing Element ... available only in standard correspondence "Selectric" code. One OPD "Selectric" 72 element in correspondence keyboard configuration 101 is furnished with the unit. See #9811 on page 23 in "Type Catalog." Additional elements may be ordered

[3] Character Spacing ... 10 characters/inch or 12 characters/inch may be specified.

[4] Line Feeding ... 6 lines/inch, unless otherwise specified. Pin feed platens are available on an SER (RPQ) basis only.

SPECIAL FEATURES

ACOUSTICAL FILTER HOOD. [Plant or field installable] This feature significantly reduces the amount of noise produced when printing output.

PARAGRAPH INDENT. [Plant or field installable] Designed for a maximum level of efficiency when preparing and revising indented material in the local mode. This feature is inoperative when receiving from a computer.

AUTO TERMINAL ID. [Plant or field installable] The four character identification sequence is permanently assigned by IBM. The plant will assign a different combination of characters to each Mag Card "Selectric" Typewriter equipped with this feature. The first character will specify terminal type and the last three will be assigned to that unit. If field installation of a new number or change to an existing number is desired.

COMMUNICATE MODE KEYLOCK. [Plant or field installable] The Keylock which inhibits the communicate mode will be furnished by IBM. Two keys will be furnished with each lock and additional keys may be purchased.

[reverse side is blank]

**2701 DATA ADAPTER UNIT**

Purpose: Attaches to a S/360 mdl 22 thru 85, 195 or any S/370 or 4300 Processor for communications with remote and local I/O devices operating via various customer or common carrier facilities.

Highlights: A modular unit which greatly expands the data communications and data acquisition I/O capabilities of S/360 and S/370. Provides for attachment of up to four half-duplex start/stop communications lines with speeds up to 600 bps ... or up to four (maximum of two operating simultaneously) half-duplex synchronous communications lines with line speeds up to 230,400 bps† ... or up to four parallel data acquisition devices (word width -- 16 to 48 bits). Various combinations of the terminal devices are possible with any 2701.

Communications Facilities: The 2701 operates in half-duplex mode ... for information concerning applicable communications facilities, see M 2700 pages, this section. The alphameric communications facility references indicated below correspond to those shown on the charts on those pages.

Terminal Devices: The 2701 can communicate with the following terminals over the facilities and in the modes and speeds indicated ... for further information about the adapters required on the 2701, see "Special Features" below.

START/STOP TERMINALS

Terminals	Speed (bps)	Facilities (1) (2)	2701 Adapter Required
1030 Systems	600.0	D2,G2	4648
1060 Systems	134.5	D1,G2	4640 w 9581
1070 Systems	134.5	D1,G2	4640 w 9581
	600.0	D2,G2	4640 w 9582
2740 mdl 1s, 2741s, or 5010 mdl As (3)	134.5	D1,G1,G2	4640 w 9581
2740 mdl 2s, or 5010 mdl As	134.5	D1,G2	4640 w 9581
	600.0	D2,G2	4640 w 9582
2845/2265s,2848/2260s	1200	D3	4656
	2400	D4	4657
3767 (as a 2740-2)	600	D2	4640 w 9582
AT&T 83B2/83B3s	45.5	A1	7860
WU 115As	56.9	A2	7861
	74.2	A3	7862
TWX - 33/35s (3)	110.0	C2	7885

FIXED 4-out-of-8 CODE TERMINALS

Note: Orders for Synchronous Data Adapter Type I (#7695,7696) are on an "as available" basis ... customer initiated deferrals of orders on 2701s which include either feature will subject the 2701 to an "as available" basis.

Terminals	Speed (bps)	Facilities (16)	2701 Adp'r Req'd (15)	Second Interface
1009,1013,7701,7702, 7710,7711,7740,7750, S/360 mdl 20 w 2703, 1130 w 7690	1200	Public Switched Telephone Network at 1200 or 2000 bps. Wide-band Service at 19.2 or 40.8 Kbps	7696	3462
1009,1013,7702,7710, 7711, 7740,S/360 mdl 20 w 2073, 1130 w 7690	2000		7696	3462
1009,1013,7702,7710, 7711,7740,S/360 mdl 20 w 2073, 1130 w 7690	2400		7696	3462
7710,7711	19.2K		7695	3461
	40.8K		7695	3461

PARALLEL DATA SERVICES

For each data path a Parallel Data Adapter (#5500) is required.

- (1) Or equivalent privately owned facility.
- (2) On appropriate facilities, an IBM Line Adapter (#4636, 4637) may be used in lieu of a data set.
- (3) On facility C1 or C2, Autocall (#1302) can be used
- (4) Appropriate transmission code, (#9060) for EBCDIC, (#9061) for ASCII, or (#9062) for 6-bit Transcode, must be specified.
- (5) Appropriate transmission code, (#9060) for EBCDIC, or (#9061) for ASCII, must be specified.
- (6) On facility C4, C5 or C6, Autocall (#1314) can be used ...
- (7) If #7698 is to operate at 1200 bps or 2400 bps, a Synchronous Clock (#7692, 7693) may be required ... see Chart 3 on M 2700 pages. When operating at 2400 bps, there

† The number and speeds of attachable lines is also a function of the attached processor, the channels assigned, and the characteristics of other devices attached to those channels.

are additional restrictions and limitations to the facility and operations ... for details, see SRE GA27-3004.

- (8) Transparency (#8029) is also required.
- (9) Specify 4-wire communications channel.
- (10) EBCDIC (#9060) must be specified on 2701.
- (12) 7200 bps operation on the 2703 is by RPQ only.
- (13) The half-speed (1200 bps) of the 3872 mdl 1 cannot be used with #4657.
- (14) Communications with the 3735 and 3275 at 1200 bps may utilize the IBM 1200 bps Line Adapter ... see Chart 2 on M 2700 pages.
- (15) When #7695 or #7696 is to operate one or two lines at 1200 bps, 2000 bps or 2400 bps, an Internal Clock may be required ... see #4703 under "Special Features."
- (16) Autocall (#1303) can be used on the Public Switched Telephone Network
- (17) Specify IBM 1200 bps Line Adapter.

BINARY SYNCHRONOUS TERMINALS

TERMINALS	SPEED (bps)	FACILITIES (1)	2701 ADAPTER REQUIRED (7)	SECOND INTERFACE
Another S/360 or S/370 via a 2701 with #7698, a 2703 with #7710, or 3704/3705 (12)	1200 2000 2400 4800 7200	C4, D3 (6) C5M, D4M (6) D4, D4SB C6, D5, D5SB D6, D6SB	7698 (4) 7698 (4) 7698 (4) 7698 (4) 7698 (5)	3464 3464 3464 3464 3464
2701 w #7697, or 3705 w #4717 (except for 230.4 Kbps which is not available on the 3705)	19.2K 40.8K 50.0K 230.4K	E3 E1 E2 E4	7697 (4) 7697 (4) 7697 (4) 7697 (4)	3463 3463 3463 3463
2701	2400 4800	X1M X2M	7698 (5) 7698 (5)	3464 3464
Series/1 w #2094 or #2074	1200 2000 2400 4800 7200 9600	C4M, D3M C5M, D4M C5M, D4M, X1M C6M, D5M, X2M D6M D7M, X3M	7698 7698 7698 7698 7698 7698	3464 3464 3464 3464 3464 3464
Series/1 w #2075	19.2K 40.8K 50.0K	E3 E1 E2	7698 7698 7698	3463 3463 3463
System/3 w #2074	1200 2000 2400 4800 4800 7200 19.2K 40.8K 50.0K	C4, D3 (6) C5M, D4M (6) D4, D4SB, X1M C6, D5, D5SB X2M D6, D6SB E3 E1 E2	7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7697 (5) 7697 (5) 7697 (5)	3464 3464 3464 3464 3464 3464 3463 3463 3463
System/7 w #2074	1200 2000 2400 4800 7200 19.2K 40.8K 50.0K	C4, D3 (6) C5M, D4M (6) D4, X1M C6, D5, X2M D6 E3 E1 E2	7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7697 (5) 7697 (5) 7697 (5)	3464 3464 3464 3464 3464 3463 3463 3463
System/32 w #2074	600 1200 2000 2400 4800 7200 19.2K 40.8K 50.0K	C3 C4, D3 (6) C5M, D4M (6) D4, D4SB, X1M C6, D5, D5SB X2M D6, D6SB	7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7697 (5) 7697 (5) 7697 (5)	3464 3464 3464 3464 3464 3464 3463 3463 3463
System/34 w #2500	600 1200	C3, D2 C4, C4M, D3, D3M	7698 (5) 7698 (5)	3464 3464
S/360 mdl 20 w #2074	2000 2400 4800 4800 7200 19.2K 40.8K 50.0K	C5M, D4M C5, D4, D4M, D4SB, A1M C6, C6M, D5, D5M, X2M D6, D6M C4, D3 (6) C5M, D4M (6) D4, D4SB, X1M C6, D5, D5SB X2M D6, D6SB E3 E1 E2	7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7697 (5) 7697 (5) 7697 (5)	3464 3464 3464 3464 3464 3464 3463 3463 3463
S/360 mdl 25 w #4580 and #7551 or #7552	1200 2000 2400 4800	C4, D3 (6) C5M, D4M (6) D4 C6, D5	7698 (5) 7698 (5) 7698 (5) 7698 (5)	3464 3464 3464 3464
S/370 mdl 115, 125 w #4640 and appropriate BSC features	1200 2000 2400 4800 4800 7200 19.2K 40.8K 50.0K	C4, D3 (6) C5M, D4M (6) D4, D4SB, X1M C6, D5, D5SB X2M D6, D6SB E3 E1 E2	7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7698 (5) 7697 (5) 7697 (5) 7697 (5)	3464 3464 3464 3464 3464 3464 3463 3463 3463
S/370 mdl 135, 135-3, 138 w #4640	1200 2000	C4, D3 C5M	7698 (5) 7698 (5)	3464 3464



2701 Data Adapter Unit (cont'd)			
and #9649-9656	2400	D4, X1M	7698 (5) 3464
	4800	C6, D5, X2M	7698 (5) 3464
	7200	D6	7698 (5) 3464
1130 System w #7690	1200	C4, D3 (6)	7698 (4) 3464
	2000	C5M, D4M (6)	7698 (4) 3464
	2400	D4	7698 (4) 3464
	4800	C6, D5	7698 (4) 3464
1131	2400	X1M	7698 (4) 3464
	4800	X2M	7698 (4) 3464
1800 System w #7550	1200	C4, D3 (6)	7698 (5) 3464
	2000	C5M, D4M (6)	7698 (5) 3464
	2400	D4	7698 (5) 3464
	4800	C6, D5	7698 (5) 3464
1826	2400	X1M	7698 (5) 3464
	4800	X2M	7698 (5) 3464
2715 mdl 2	1200	C4, D3 (6)	7698 (5) (8) 3464
	2000	C5M, D4M (6)	7698 (5) (8) 3464
	2400	D4	7698 (5) (8) 3464
	4800	C6, D5	7698 (5) (8) 3464
2770 System	1200	C4, D3 (6)	7698 (5) 3464
	2000	C5M, D4M (6)	7698 (5) 3464
	2400	D4, D4SB	7698 (5) 3464
	4800	D5, D5SB	7698 (5) 3464
	7200	D6, D6SB	7698 (5) 3464
2772	2400	X1M	7698 (5) 3464
	4800	X2M	7698 (5) 3464
2780	1200	C4, D3 (6)	7698 (4) 3464
	2000	C5M, D4M (6)	7698 (4) 3464
	2400	D4, X1M	7698 (4) 3464
	4800	D5, D5SB, X2M	7698 (4) 3464
3271/3277	1200	D3	7698 (5) 3464
	2000	D4M	7698 (5) 3464
	2400	D4, D4SB	7698 (5) 3464
	4800	D5, D5SB	7698 (5) 3464
	7200	D6, D6SB	7698 (5) 3464
3271 mdls 1, 2	2400	X1M	7698 (5) 3464
	4800	X2M	7698 (5) 3464
3275	600	C3	7698 (5) 3464
	1200	C4, D3 (14)	7698 (5) 3464
	2000	D4M	7698 (5) 3464
	2400	D4, D4SB	7698 (5) 3464
	4800	D5, D5SB	7698 (5) 3464
	7200	D6, D6SB	7698 (5) 3464
3275 Mdls 1, 2	2400	X1M	7698 (5) 3464
	4800	X2M	7698 (5) 3464
3704	2400	X1M	7698 (5) 3464
	4300	X2M	7698 (5) 3464
3705	2400	X1M	7698 (5) 3464
	4800	X2M	7698 (5) 3464
3735	1200	C4, D3	7698 (5)(14) 3464
	2000	C5M, D4M	7698 (5) 3464
	2400	D4, X1M	7698 (5) 3464
	4800	C6, D5, D5SB	7698 (5) 3464
	4800	X2M	7698 (5) 3464
3741 mdl 2	1200	C4, D3 (6)	7698 (5) 3464
3747	2000	C5M, D4M (6)	7698 (5) 3464
	2400	C5, D4, X1M	7698 (5) 3464
3771,3773,3774,3775	1200	C4, D3 (6)	7698 (5) 3464
3771,3773,3774,3775	2000	C5M, D4M (6)	7698 (5) 3464
(w #1460, 1461 or 1462)	2400	D4, D4SB, X1M	7698 (5) 3464
	4800	C6, D5, D5SB	7698 (5) 3464
	4800	X2M	7698 (5) 3464
3776	2000	C5M, D4M (6)	7698 (5) 3464
(w #1460, 1461 or 1462)	2400	D4, D4SB, X1M	7698 (5) 3464
	4800	C6, D5, D5SB	7698 (5) 3464
	4800	X2M	7698 (5) 3464
3777 mdl 1	2400	X1M	7698 (5) 3464
(w #1460, 1461 or 1462)	4800	C6, D5, D5SB	7698 (5) 3464
	4800	X2M	7698 (5) 3464
	7200	D6, D6SB	7698 (5) 3464
3777 mdl 2	2400	X1M	7698 (5) 3464
	4800	C6, D5, D5SB	7698 (5) 3464
	4800	X2M	7698 (5) 3464
	7200	D6, D6SB	7698 (5) 3464
3780	1200	C4, D3 (6)	7698 (5) 3464
	2000	C5M, D4M (6)	7698 (5) 3464
	2400	D4, D4SB, X1M	7698 (5) 3464
	4800	D5, X2M	7698 (5) 3464
	7200	D6, D6SB	7698 (5) 3464
5231 mdl 2	1200	C4, D3 (6)	7698 (10) 3464
	2000	C5, D4M (6)	7698 (10) 3464
	2400	C5, D5 (6)	7698 (10) 3464

MODEMS ... up to two of the following IBM Modems may be attached to the 2701.

MODEM	SPEED (bps)	2701 ADAPTER REQUIRED
3863 mdl 1 or 2	2400	7698 (5)
3872 mdl 1	2400	7698 (5) 4657
3864 mdl 1 or 2	4800	7698 (5)
3874 mdl 1	4800	7698 (5)
3875 mdl 1	7200	7698 (5)
3865 mdl 1 or 2	9600	7698 (5)

Customer Responsibilities: See M 2700 pages. The customer is also responsible for furnishing signal levels and impedance matching in accordance with specifications outlined in OEMI Manual GA22-6844 for the Parallel Data Adapter (#5500) or any of the synchronous or start/stop adapters if he provides the data sets, telegraph terminations, or privately owned communications facilities.

PREREQUISITES: The 2701 requires a control unit position on a system channel.

S/360 mdl 22 -- multiplexer channel (standard) ... see 2022.

S/360 mdl 25 -- Multiplexer Channel (special feature) ... see 2025.

S/360 mdl 30, 40, 50 -- multiplexer channel (standard), or Selector Channels (special features) ... see 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, or Add'l High Speed Multiplexer Subchannels ... see 2044.

S/360 mdl 65, 75 -- selector channel of 2860, basic multiplexer channel of 2870, or Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 67 -- selector channel of 2860, or basic multiplexer channel of 2870 ... see 2860, 2870.

S/360 mdl 85, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, or shared subchannel of 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channels (special features) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) -- see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel, selector channels (standard) ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channel ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- byte multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158. **Limitations:** Each SD-II attached to a block multiplexer channel operating in block multiplexing mode must be assigned to a unique shared subchannel and if the 2701 is to be field installed, it must be at EC level 309060 or above.

S/370 mdl 165, 168, 195 -- selector channel of 2860, multiplexer channel of 2870, Selector Subchannels (special features) of 2870, shared subchannel of 2880 ... see 2860, 2870, 2880.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032. See "3031, 3032, 3033 Limitations" below.

3033 Processor -- byte multiplexer channels (2 are standard), block multiplexer channels (10 are standard) ... see 3033. See "3031, 3032, 3033 Limitations" below.

3031, 3032, 3033 Limitations: Each SD-II attached to a block multiplexer channel operating in block multiplexing mode must be assigned to a unique shared subchannel and, if the 2701 is to be field installed, it must be at EC level 309060 or above.

4331 Processor -- byte multiplexer channel (special feature), block multiplexer channel (special feature) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channel (two are standard) ... see 4341.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60Hz): #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Specification Sheet: A completed 2701 Specification Sheet, must be submitted at time of order ...

2701 Data Adapter Unit (cont'd)

- [4] Isolation, Control Unit: May be required on units shipped prior to December 29, 1967 ... see #4700 under "Special Features."
- [5] A Cable Order must be submitted for: (1) Each new machine order, (2) Each order where the added feature requires external cable ... see S/370 Installation Manual, Physical Planning, SRL GC22-7004, for cabling instructions.

PRICES:	Mdl	MAC/ MRC	Purchase	MMM
2701	1	\$ 234	\$ 7,915	\$ 23

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Warranty: B Purchase Option: 50%
 Machine Group: B Per Call: 3
 Metering: Assignable Unit

SPECIAL FEATURES

Before ordering special features, consult feature descriptions and "Maximum Configuration" below. A completed, revised 2701 Specification Sheet, and copy of the latest preceding specifications sheet must be submitted with each special features.

AUTOCALL (#1302, 1303, 1314). Provides automatic dialing capabilities on Public Switched Networks. One of these features is required for each line equipped to automatically originate calls on switched networks. For the appropriate Automatic Calling Units, see Chart 3B on M 2700 pages.

#1302 -- requires either an IBM Terminal Adapter Type I, Mod II (#4640) with speed selection #9581, or Telegraph Adapter Type II (#7885). **Note:** When ordering #1302 for field installation, a new #4640 with #9581 must be ordered to replace an installed #4640/9581 [or the superseded IBM Terminal Adapter Type I (#4645)].

#1303 -- requires Synchronous Adapter Type I (#7696) and Internal Clock (#4703).

#1314 -- requires Synchronous Adapter Type II (#7698).

Maximum: One per adapter ... two #1302s or one #1303 or #1314 per 2701 without Expanded Capability (#3815) ... four #1302s, two #1303s or #1314s, or two #1302s and one #1303 or #1314 if #3815 is installed.

CHANNEL INTERFACE, SECOND (#1860). Provides the ability to attach the adapter(s) housed in the Expanded Capability (#3815) gate to a channel interface other than the one provided with the basic 2701. **Maximum:** One. **Prerequisites:** Expanded Capability (#3815) and an Expansion Feature (#3855).

DUAL CODE (#3455). Permits a second code type, optional under program controlled selection, for the Synchronous Data Adapter Type II (#7697, 7698). **Specify:** #9070 for EBCDIC, #9071 for ASCII, or #9072 for 6-bit Transcode. **Prerequisite:** A Synchronous Data Adapter Type II (#7697, 7698) ... also see Station Selection (#7477) and Transparency (#8029) for applicability.

DUAL COMMUNICATION INTERFACE (#3461-3464). Provides the Synchronous Data Adapter Type I (#7695, 7696) or Type II (#7697, 7698) with capability to interface with an additional facility ... determination of which interface is operational is under program control.

For #7695 or #7696

#3461 -- for operation on Common Carrier Type 5701, 5703, 8801 or 8803 Wideband Services.

#3462 -- for operation on the Public Switched Telephone Network or a Non-switched Voice Grade Line.

Limitation: Autocall (#1303) is not operational on the Dual Communication Interface.

For #7697 or #7698

#3463 -- for operation with facility E1, E2 or E3.

#3464 -- for operation with facility C4, C5, C6, D3, D4, D5 or D6.

Limitation: Autocall (#1314) is not operable on the Dual Communication Interface.

Restriction: The 2701 does not permit simultaneous operation of two lines attached to the same Synchronous Data Adapter. **Prerequisite:** An appropriate Synchronous Data Adapter Type I (#7695, 7696) or Type II (#7697, 7698) ... also see Internal Clock (#4703) or Synchronous Clock (#7692, 7693) for applicability.

EXPANDED CAPABILITY (#3815). Provides an additional gate that allows additional combinations of adapters ... allows for one additional adapter from Category II, or up to two adapters from Category I ... see "Maximum Configuration" below. Specify this feature if: [1] Channel Interface, Second (#1860) is ordered ... [2] Adapters from two different categories are required ... [3] More

than two adapters from Category I or more than one from Category II are required. **Maximum:** One.

EXPANSION FEATURE (#3855). Provides the 2701 with the capability of operating with an add'l adapter. The number required per 2701 equals one less than the number of adapters specified ... see "Maximum Configuration" below. **Maximum:** One per 2701 without Expanded Capability (#3815) ... three per 2701 with #3815.

†**IBM LINE ADAPTER (#4636, 4637).** A modem for 2-wire limited distance use up to 8 wire-miles ... see Limited Distance Line Adapter Type 2 in SRL GA24-3435†† for specifications and restrictions. For operation of 1030/1050/1060/1070/2740/2741/5010 over facilities which conform to the specifications in the manual referenced above.

#4636 -- for operation at 134.5 bps over facility G2.

#4637 -- for operation at 600 bps over facility G2.

Prerequisites: Each #4636 requires an IBM Terminal Adapter Type I, Mod II (#4640) with speed selection #9581 [or the replaced IBM Terminal Adapter Type I (#4645)] ... each #4637 requires a #4640 with speed selection #9582 [or the replaced #4646], or an IBM Terminal Adapter Type II (#4648).

†**IBM TERMINAL ADAPTER TYPE I, MOD II (#4640).** Controls data transfers between S/360 or S/370 and 1060/1070/2740/2741/5010 over facility C1, C2, D1, D2 or G2. Includes vertical and longitudinal redundancy checking for 1050/1060/1070 terminals and 2740s equipped with Record Checking (#6114). **Speed Selection:** One of the following must be specified -- #9581, for operation at 134.5 bps to 1060/1070/2740/2741/5010 ... #9582, for operation at 600 bps to 1070/5010/2740 mdl 2s. #9581 can be changed in the field to #9582, or vice versa. **Note:** A 2740 may be attached with any combination of its Record Checking (#6114) and Station Control (#7479) features, or with neither.

If the facility is G2 conforming to the line requirements for Limited Distance Line Adapter Type 2 in SRL GA24-3435††, #4640 may be used with an appropriate IBM Line Adapter (#4636, 4637) in lieu of a data set. **Maximum:** One per 2701 without Expansion Feature (#3855) ... two with one #3855 ... three with two #3855s and Expanded Capability (#3815) ... four with three #3855s and #3815. **Limitation:** See "Maximum Configuration" below. **Special Requirements:** See Autocall (#1302) for applicability.

Note: #4640 with #9581 or #9582 replaces the withdrawn IBM Terminal Adapter Type I (#4645, 4646)

†**IBM TERMINAL ADAPTER TYPE II (#4648).** Controls data transfers between S/360 or S/370 and 1030 terminals operating at 600 bps over facility G2, if the facility conforms to the line requirements for Limited Distance Line Adapter Type 2 in SRL GA24-3435††, #4648 may be used with an IBM Line Adapter (#4637) in lieu of a data set. **Maximum:** One per 2701 without Expansion Feature (#3855) ... two with one #3855 ... three with two #3855s and Expanded Capability (#3815) ... four with three #3855s and #3815. **Limitations:** See "Maximum Configuration" below.

†**IBM TERMINAL ADAPTER TYPE III (#4656, 4657).**

#4656 -- control data transfers between a S/360 or S/370 and either remote 2845 Display Controls and/or 2848 Display Controls operating at 1200 bps over facility D3.

#4657 -- permits operation with 2845s and/or 2848s at 2400 bps over facility D4, if the data set provides clock pulses.

Maximum: One per 2701 without Expanded Capability (#3815) ... two with #3815 and an Expansion Feature (#3855). **Limitations:** See "Maximum Configuration" below. **Prerequisite:** This feature requires a CPU with 16K bytes of core storage or larger.

INTERNAL CLOCK (#4703). Required for Synchronous Data Adapter Type I (#7696) or Dual Communication Interface (#3462) if at least one data set does not provide clock pulses. Provides clocking, under program selection, for 1200 bps, 2000 bps or 2400 bps operation. **Maximum:** One per #7695 or #7696.

ISOLATION, CONTROL UNIT (#4700). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2701 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements.

IBM LINE ADAPTER BASE (#4708). Provides for mounting of up to two IBM 1200 bps Line Adapters and their associated Automatic Call Origination features. **Limitation:** Cannot be installed when

† For further information, see M 2700 pages.

†† SRL GA24-3435-2, or subsequent revisions.

**2701 Data Adapter Unit (cont'd)**

any one of the following features is installed: IBM Line Adapter (#4636 or #4637), Telegraph Adapter, Type I (#7860, 7861 or 7862). **Maximum:** One per 2701. **Field Installation:** Yes. **Prerequisites:** Synchronous Data Adapter, Type II (#7698), with a Synchronous Clock (#7692).

IBM 1200 BPS LINE ADAPTER, LEASED (#4781). Provides one IBM 1200 bps Line Adapter which is suitable for communications over facility D3 with a similar line adapter. **Maximum:** Two per 2701. **Field Installation:** Yes. **Prerequisite:** IBM Line Adapter Base (#4708).

IBM 1200 BPS LINE ADAPTER, SWITCHED (#4782). Provides one IBM 1200 bps Line Adapter which is suitable for communications over facility C4 with a similar line adapter. Attachment of this line adapter to the switched telephone network requires the use of a Type CBS Data Access Arrangement. This line adapter includes the automatic answering capability. **Maximum:** Two per 2701. **Field Installation:** Yes. **Prerequisite:** IBM Line Adapter Base (#4708).

AUTOMATIC CALL ORIENTATION (#4791). Provides the capability of automatically (under program control) dialing over the switched telephone network to a remote terminal. **Limitations:** This feature can be used on rotary dial systems only. Cannot be installed with Selectable Synchronous Clock (#7401). **Maximum:** One per IBM 1200 BPS Line Adapter, Switched (#4782). **Prerequisites:** IBM Line Adapter, Switched (#4782) and Autocall (#1314).

PARALLEL DATA ADAPTER (#5500). Provides a 16-bit wide path to customer devices ... odd parity and redundancy checking ... can be expanded to 48 bits [see Parallel Data Expansion (#5505) below] Mode of operation is half-duplex at speeds limited only by channel and system configuration. A maximum of eight customer devices can be connected to the interface. However, there is but one data path shared by all devices. **Maximum:** One per 2701 without Expansion Feature (#3855) ... two per 2701 with one #3855 [neither #5500 can have more than two Parallel Data Expansions (#5505)] ... two per 2701 with one #3855 and Expanded Capability (#3815) [either or both #5500s may have more than two #5505s] ... three per 2701 with two #3855s and #3815 [only one of the three #5500s may have more than two #5505s] ... four per 2701 with three #3855s and #3815 [none of the #5500s may have more than two #5505s]. **Limitations:** See "Maximum Configuration" below.

PARALLEL DATA TIMEOUT (#5501). Provides a 2-second timeout of the external device responses to data transfer requests from a Parallel Data Adapter (#5500). **Maximum:** One per #5500.

PARALLEL DATA EXTENSION (#5505). Provides an add'l 8 data bit extension to the parallel data customer interface. **Maximum:** Four per Parallel Data Adapter (#5500). **Limitations:** See #5500 above and "Maximum Configuration" below.

SECOND CHANNEL ENABLE/DISABLE SWITCH (#6301). Provides ability to disable 2701 functions to either CPU when the Second Channel Interface (#1860) is being used with two CPUs ... for field installation on units with #1860 installed prior to December 29, 1967 ... standard on #1860s shipped after that. **Prerequisites:** Second Channel Interface (#1860) ... 2701 must be at EC level 306675.

SELECTABLE SYNCHRONOUS CLOCK (#7401). Provides a synchronous clock which is capable of operation at 600 bps or at 1200 bps and provides a manual switch to allow the operator to select one of these two speeds. **Maximum:** One per Synchronous Data Adapter, Type II (#7698). **Limitations:** Cannot be installed with any other synchronous clock or with Automatic Call Origination (#4791) ... when the Dual Communication Interface is installed, and this clock is to operate on both the basic and dual interface, both interfaces must operate at the same speed. **Prerequisite:** Synchronous Data Adapter, Type II (#7698).

+++SYNCHRONOUS DATA ADAPTER TYPE I (#7695, 7696). [Plant Installation only] Provides control of data transfers between S/360 or S/370 and 4-out-of-8 code synchronous terminals [1009s, 1013s, 7701s, 7702s, 7710, 7711, 7740s, 7750s, S/360 mdl 20s with #2073s, 1130s with #7690s].

#7695 -- permits operation on common carrier Type 5701, 5703, 8801 or 8803 Wideband Services.

#7696 -- permits operation on the Public Switched Telephone Network or a Non-switched Voice Grade Line.

Maximum: One per 2701 without Expanded Capability (#3815) ... two with #3815 and one Expansion Feature (#3855). **Limitations:** See "Maximum Configuration" below. **Special Requirements:** See Autocall (#1303) and Internal Clock (#4703) for applicability.

†SYNCHRONOUS DATA ADAPTER TYPE II (#7697, 7698). Pro-

vides control of data transfers between S/360 or S/370 and binary synchronous terminals ... see "Terminal Devices" above.

#7697 -- permits operation with *high speed digital facilities*.

#7698 -- permits operation with *voice grade facilities*.

Specify: For each adapter one of the following is required -- #9060 for EBCDIC code, #9061 for ASCII code, or #9062 for 6-bit Transcode. **Limitations:** #9062 cannot be used to communicate with a System/32 with #2074, a S/360 mdl 20 with #2074, a S/360 mdl 25 with #4580, a 2703 with #7703 or #7706, an 1800 system with #7550, a 2770 system, a 3735, 3741 mdl 2 or 4, 3747, 3780 or 2715 mdl 2 ... also see "Maximum Configuration" below. Neither #9061 nor #9062 can be used to communicate with a 3671 Shared Terminal Control Unit or a 5231 mdl 2. **Maximum:** One per 2701 without Expanded Capability (#3815) ... two with #3815 and one Expansion Feature (#3855) ... for added line capability per adapter, see Dual Communication Interface (#3463, 3464).

Special Requirements: See Autocall (#1314), Dual Code (#3455), Station Selection (#7477), Synchronous Clock (#7692, 7693) and Transparency (#8029) for applicability. **Note:** When ordering #7697 or #7698 for field installation in adapter position No. 1, all features in position No. 1 and No. 2 must be removed ... for field installation in position No. 3, all adapter features in position No. 3 and all features in position No. 4 must be removed.

SYNCHRONOUS CLOCK (#7692, 7693).

#7692 -- required for a Synchronous Data Adapter Type II (#7698) or Dual Communication Interface (#3464) if at least one data set attached requires external clocking at 1200 bps.

#7693 -- required for the same combinations above if at least one data set attached requires external clocking at 2400 bps.

Maximum: One per #7697 or #7698. **Limitation:** If #7692 or #7693 is required for both lines when using Dual Communication Interface (#3464), both lines must operate at the same speed.

STATION SELECTION (#7477). Required when a Synchronous Data Adapter Type II (#7697, 7698) and/or Dual Code (#3455) is functioning on a leased communications line as a tributary (terminal) station. **Maximum:** One per #7697 or #7698.

†TELEGRAPH ADAPTER TYPE I (#7860-7862). Controls data transfers between S/360 or S/370 and various teletypewriter terminals ... line control must be identical to AT&T Selective Calling Terminals Type 83B2/83B3 or WU Plan 115A Terminals ... a 62.6 milliampere neutral DC Loop is required ... both types of terminals cannot be mixed on the same line.

#7860 -- for operation at 45.5 bps with facility A1.

#7861 -- for operation at 56.9 bps with facility A2.

#7862 -- for operation at 74.2 bps with facility A3.

Maximum: One per 2701 without Expansion Feature (#3855) ... two with one #3855 ... three with two #3855s and Expanded Capability (#3815) ... four with three #3855s and #3815. **Limitations:** See "Maximum Configuration" below.

†TELEGRAPH ADAPTER TYPE II (#7885). Controls data transfers between S/360 or S/370 and Mdl 33/35 TTY Terminals (8 level code at 110 bps only) with facility C2. **Maximum:** One per 2701 without Expansion Feature (#3855) ... two with one #3855 ... three with two #3855s and Expanded Capability (#3815) ... four with three #3855s and #3815. **Limitations:** See "Maximum Configuration" below. **Special Requirements:** See Autocall (#1302) for applicability.

TRANSPARENCY (#8029). Provides a Synchronous Data Adapter Type II (#7697, 7698) and/or Dual Code (#3455) with the ability to transmit and receive 8-bit binary data as well as EBCDIC or ASCII codes ... or 6-bit binary data as well as 6-bit Transcode. Transparency for ASCII modifies VRC/LRC checking to VRC/CRC checking. **Limitation:** ASCII code transparency is not available on the 2780 Data Transmission Terminal, 2770 Data Communication System, 3780 Data Communications Terminal, 3735 Programmable Buffered Terminal, or a System/3 or System/32. Therefore a 2780, 3735 or System/3 with ASCII code will not operate with a 2701 equipped with #8029 when the #8029 is assigned to the ASCII code. To communicate with a 2701 in transparent mode, the 2780 must be equipped with EBCDIC Transparency (#8030), the 2770 with EBCDIC Transparency (#3650), the 3780 with EBCDIC Transparency (#3601), or the System/3 with Text Transparency (#7850). The 3735 will operate in EBCDIC with a 2701 with or without #8029 assigned to EBCDIC. On System/32, ASCII, EBCDIC and EBCDIC Transparency are standard and one is selected by programming. The 5231 mdl 2 does not support transparent mode. **Specify:** Either or both of the following -- #9700 for use with #9060, 9061 or 9062 on Synchronous Data Adapter Type II (#7697, 7698) ... or #9701 for use with #9070, 9071 or 9072 on Dual Code (#3455). **Maximum:** One per #7697 or #7698. **Prerequisites:** A Synchronous Data Adapter Type II

† For further information, see M 2700 pages.

†† Orders for #7695 or #7696 are on an "as available" basis ... customer initiated deferrals or orders for 2701s which include either feature will subject the 2701 orders to an "as available" basis.



2701 Data Adapter Unit (cont'd)

(#7697, 7698) ... when this feature is ordered there are additional restrictions and limitations to the facility and operation. For details, see SRL GA27-3004.

MAXIMUM CONFIGURATION

As an aid in determining allowable and maximum adapter configurations, the adapters have been categorized as belonging to Category I or Category II.

If more than two adapters from Category I, more than one adapter from Category II, or at least one adapter from each of the two Categories are to be installed, Expanded Capability (#3815) is required.

Category I

- IBM Terminal Adapter Type I, Mod II (#4640)
- IBM Terminal Adapter Type II (#4648)
- Telegraph Adapter Type I (#7860, 7861, 7862)
- Telegraph Adapter Type II (#7885)
- Parallel Data Adapter (#5500), with two or less Parallel Data Extensions (#5505)

Category II

- Parallel Data Adapter (#5500), with more than two Parallel Data Extensions (#5505)
- Synchronous Data Adapter Type I (#7695, 7696)
- Synchronous Data Adapter Type II (#7697, 7698)
- IBM Terminal Adapter Type III (#4656, 4657)

Maximum Basic 2701 (w/o Expanded Capability, #3815)

Two adapters from Category I ... or one from Category II.

Maximum 2701 w #3815

Four adapters from Category I ... or two from Category II ... or two from Category I and one from Category II.

Notes: [1] An Expansion Feature (#3855) is required for each adapter after the first.

[2] Channel Interface, Second (#1860) requires Expanded Capability (#3815).

[3] Unless otherwise stated, an adapter as listed in the above Categories includes the adapter and all its associated features.

SPECIAL FEATURE PRICES: Before ordering, consult individual feature descriptions and "Maximum Configuration" above.

	MAC/ MRC	Purchase	MMMC	FIC	
Autocall	#1302	\$ 38	\$ 1,325	\$ 3.50	\$193
	1303	38	1,325	3.50	193
	1314	54	1,675	1.00	166
Channel Interface, 2nd	1860	38	1,325	1.50	295
Dual Code	3455	42	1,090	1.00	39
Dual Commun Interface	3461	21	824	1.50	116
	3462	21	824	1.50	116
	3463	48	1,505	1.00	166
	3464	48	1,505	1.00	166
Expanded Capability	3815	28	1,005	NC	423
Expansion Feature	3855	89	3,060	9.00	397
IBM Line Adapter					
134.5 bps	4636	10	434	2.50	193
600 bps	4637	10	434	2.50	193
IBM Terminal Adapter					
Type I	4640	84	2,850	9.50	270
Type II	4648	84	2,850	9.50	270
Type III-1200 bps	4656	140	4,565	12.00	321
Type III-2400 bps	4657	140	4,565	12.00	321
Internal Clock	4703	49	1,785	3.00	142
Isolation, Control Unit	4700	NC	NC	NC	NC
IBM Line Adapter Base	4708	49	1,360	1.50	95
IBM 1200 BPS Line Adapter					
Leased	4781	16	535	3.50	NC
Switched	4782	21	714	4.00	NC
Auto Call Origination	4791	72	1,970	14.00	135
Parallel Data Adapter	5500	145	4,235	14.00	473
Parallel Data Timeout	5501	10	260	1.00	116
Parallel Data Extension	5505	10	260	3.00	270
2nd Channel Enable/ Disable Switch	6301	NC	NC	NC	NC
Selectable Sync Clock	7401	50	1,555	1.00	226
Station Selection	7477	42	1,090	1.00	142
Synchronous Clock	7692	48	1,505	1.00	91
	7693	48	1,505	1.00	91
††† Sync Data Adptr Ty	17695	336	11,730	28.50	PO
	7696	336	11,730	28.50	PO
Sync Data Adptr Ty II	7697	336	11,730	28.50	729*
	7698	336	11,730	28.50	729*
Telegraph Adapter Type I					
45.5 bps	7860	84	2,850	9.50	270
56.9 bps	7861	84	2,850	9.50	270
74.2 bps	7862	84	2,850	9.50	270
Telegraph Adptr Ty II	7885	84	2,850	9.50	270
Transparency	8029	81	2,840	1.00	54

* The FIC for conversion from #7697 to #7698 or vice versa is \$127.

††† Orders for #7695 or #7696 are on an "as available" basis ... customer initiated deferrals or orders for 2701s which include either feature will subject the 2701 orders to an "as available" basis.

**2702 TRANSMISSION CONTROL**

[no longer available]

Specify: Communication Cable Order. A Cable Order must be submitted for each order where the added feature requires external cable. See S/370 Installation Manual - Physical Planning, SRL GC22-7004, for cabling information.

SPECIAL FEATURES

The following special features are on an "As Available" basis for field installation.

Limitations:

- [1] Up to three of the four available terminal controls #4615, #4616, #7911, #7912 can be installed.
- [2] Up to four selective speeds can be specified.
 - (a) With either #4615 or #7911, one selective speed must be specified.
 - (b) With each Add'l Selective Speed (#1065), another selective speed other than that specified for #4615 or #7911 must be specified.
- [3] The combined total of terminal controls [maximum, three], Add'l Selective Speeds (#1065) [maximum, two], 2741 Break (#8055) [maximum, one], and Type I Terminal Interrupt (#8200) [maximum, one] cannot exceed four.
- [4] #4616 cannot be used when 2741 Break (#8055) is installed.

ADDITIONAL SELECTIVE SPEED (#1065). To add an additional different selective speed with IBM Terminal Control-Type I (#4615) or Telegraph Terminal Control-Type I (#7911). Permits attachment of terminals/facilities of more than one speed to the same terminal control. **Maximum:** Two ... one with #4615, the other with #7911 ... also see "Limitations" above. **Specify:** With #4615 -- #9683 for 75 bps, #9684 for 134.5 bps, or #9685 for 600 bps. With #7911 -- #9680 for 45.5 bps, #9681 for 56.9 bps, or #9682 for 74.2 bps. **Prerequisites:** IBM Terminal Control-Type I (#4615) or Telegraph Terminal Control-Type I (#7911) ... Selective Speed (#9685) requires Speed Extension (#7387).

AUTOCALL ADAPTER (#1290). For attachment to an automatic calling unit. **Maximum:** Eight ... with Autocall Expansion (#1311), sixteen. **Prerequisites:** Autocall Feature (#1310), and, for each line, a Data Set Adapter (#3233).

AUTOCALL FEATURE (#1310). Provides automatic dialing capabilities on facilities C1 and C2 for up to eight lines. **Maximum:** One.

AUTOCALL EXPANSION (#1311). Expands the automatic dialing capability to sixteen line attachments. **Maximum:** One. **Prerequisite:** Autocall Feature (#1310).

AUTO POLL (#1319). Operates in conjunction with IBM Terminal Control-Type I (#4615) and/or IBM Terminal Control-Type II (#4616) to allow continuation of polling after negative responses on all of the lines served by those terminal controls without having program interruptions. **Maximum:** One. **Prerequisite:** IBM Terminal Control-Type I (#4615) or Type II (#4616).

† **DATA SET LINE ADAPTER (#3233).** To attach an external data set for operation -- at 110 bps over facility C2 -- at 134.5 bps over facility C1, C2 or D1 -- at 600 bps over facility D2. Or to attach a line to a 2711 Line Adapter Unit. **Maximum:** Fifteen ... with 31 Line Expansion (#7955), thirteenth.

EXPANSION BASE (#3853). Required if an IBM Line Adapter (#4634, 4635) is to be installed. **Maximum:** One.

† **IBM LINE ADAPTER (#4612, 4613).** A modem for 2-wire, limited distance use up to 8 wire-miles. See "Limited Distance Line Adapter, Type 2" in SRL GA24-3435** for specifications and restrictions.

#4612 -- for use with 1060 or 1070 systems, or 2740/2741 terminals or 5010 operating at 134.5 bps over facility G2.

#4613 -- for use with 1030, 1070 systems, or 2740 mdl 2 terminals or 5010 operating at 600 bps over facility G2.

Maximum: #4612 and #4613 are assigned a weight of three (3) each, where the total weight of IBM Line Adapters (#4612, 4613, 4634 and 4635) may not exceed fifty (50). **Limitations:** #4612 and #4613 may not be installed if both 1032 Attachment (#7918) and IBM Line Adapters (#4634 or #4635) are to be installed. Only fifteen #4612s/4613s may be installed if #7918 is installed. If maximums are exceeded, investigate possible use of a 2711 Line Adapter Unit. **Prerequisites:** For either -- IBM Terminal Control-Type I or II (#4615, 4616) ... For #4613 -- Speed Extension (#7387) ... for more than fifteen #4612s -- 31 Line Expansion (#7955).

† **IBM LINE ADAPTER (#4634, 4635).** A modem for local use up to

† For further information, see M 2700 pages.

** SRL GA24-3435-2, or subsequent releases.

4.75 wire-miles over facility G1. See "Limited Distance Line Adapter, Type I," in SRL manual GA22-3435** for specifications and restrictions. **Maximum:** #4634 and #4635 are assigned a weight of two (2) each, where the total weight of IBM Line Adapters (#4612, 4634, 4635) may not exceed fifty (50). **Limitations:** #4634 and #4635 may not be installed if both 1032 Attachment (#7918) and IBM Line Adapters (#4612, 4613) are to be installed. Only twenty-one #4634/4635s may be installed if #7918 is installed. **Prerequisites:** IBM Terminal Control-Type I (#4615) and Expansion Base (#3853) and, for more than fifteen, 31 Line Expansion (#7955).

IBM TERMINAL CONTROL-TYPE I (#4615). Controls for attachment of 1060s/1070s/2740s/2741s/5010. Includes vertical and horizontal redundancy checking for 1060s/1070s/5010 ... the same checking is provided for 2740s if they are equipped with Record Checking (#6114). 2740s can be attached when equipped with any combination of their Record Checking (#6114) and Station Control (#7479) features, or with neither. **Maximum:** One ... also see "Limitations" above. **Specify:** Selective Speed -- #9683 for 75 bps operation, #9684 for 134.5 bps, or #9685 for 600 bps ... for more than one speed, see Add'l Selective Speed (#1065). **Prerequisites:** Terminal Control Base (#9696) ... see "Specify". Selective Speed (#9685) also requires Speed Extension (#7387).

IBM TERMINAL CONTROL-TYPE II (#4616). Controls for attachment of 1031 Input Station mdl As ... includes vertical redundancy checking. **Maximum:** One ... also see "Limitations" above. **Limitation:** Not available if 2741 Break (#8055) is installed. **Prerequisite:** Speed Extension (#7387) ... Terminal Control Base (#9696) [see "Specify"].

ISOLATION, CONTROL UNIT (4700). [For field installation only on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2702 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements.

REMOTE SWITCH ATTACHMENT (#6148). Provides partitioning and the ability to attach the Two Processor Switch (#8110) to a S/360 mdl 65 MP which has the Configuration Control Panel (#1505) installed or to a 2167 Configuration Unit ... for use in a multiprocessor S/360 mdl 65 or a S/360 mdl 67-2 only.

SPEED EXTENSION (#7387). Increase line speed capability to 600 bps on all fifteen lines of the basic 2702. **Limitation:** Cannot be installed with 31 Line Expansion (#7955). **Maximum:** One.

† **TELEGRAPH LINE ADAPTER (#7895).** For attachment to the A1 facility at 45.5 bps, the A2 facility at 56.9 bps or the A3 facility at 74.2 bps. A 62.5ma neutral DC Loop is required. **Maximum:** Fifteen ... with 31 Line Expansion (#7955), thirteenth.

TELEGRAPH TERMINAL CONTROL-TYPE I (#7911). Controls for attachment of AT&T 83B2/83B3 or WU Plan 115A terminals. **Maximum:** One ... also see "Limitations" above. **Specify:** Selective Speed -- #9680 for 45.5 bps operation, #9681 for 56.9 bps, or #9682 for 74.2 bps ... for more than one speed, see Add'l Selective Speed (#1065). Automatic Downshift on Space Character -- #9100. When specified, it governs for all lines using #7911 ... used with this type terminal control only. **Prerequisite:** Terminal Control Base (#9697) ... see "Specify".

TELEGRAPH TERMINAL CONTROL-TYPE II (#7912). Controls for attachment of TWX stations using 8 level code at 110 bps. **Maximum:** One ... also see "Limitations" above. **Prerequisite:** Terminal Control Base (#9697) ... see "Specify".

1032 ATTACHMENT (#7918). To attach a 1032 Digital Time Unit via a 20' cable supplied with the 1032. **Limitations:** Must go on Line Address No. 1 ... unavailable if more than fifteen IBM Line Adapters (#4634, 4635) are installed, or if both an IBM Line Adapter (#4612, 4613) and an IBM Line Adapter (#4634, 4635) are installed. **Maximum:** One. [Note: Other 1030 terminals may operate remotely on the same line.] **Prerequisites:** IBM Terminal Control-Type II (#4616) and Speed Extension (#7387) ... if not to be attached to a line previously specified for Line Address No. 1, a Data Set Line Adapter (#3233) or IBM Line Adapter (#4613) specified for Line Address No. 1 is also required. Digital Time Read-out Control, 2702 (#3273) is required on the 1032.

TERMINAL CONTROL EXPANSION (#7935). Required if both IBM and telegraph terminals are to be attached to the same 2702. **Maximum:** One. **Prerequisites:** Terminal Control Base (#9696) and (#9697) ... see "Specify".

31 LINE EXPANSION (#7955). Increase line attachment capability to thirty-one half-duplex communications lines operating at speed up to 200 bps. **Limitation:** Cannot be installed with Speed Extension (#7387). **Maximum:** One.

2741 BREAK (#8055). Allows the IBM Terminal Control-Type I (#4615) to operate with a 2741 with Receive Interrupt (#4708). #4615 may be used independently of this feature even though



2702 Communication Control (cont'd)

#8055 is installed. **Limitation:** Not available if Terminal Control-Type II (#4616) or Type I Terminal Interrupt (#8200) is installed. **Maximum:** One. **Prerequisites:** IBM Terminal Control-Type I (#4615) with Selective Speed (#9684) ... If IBM Line Adapters are used they must be 4-wire version ... If the #4615 is to control other, non-interrupt 134.5 bps terminals, two #9684s are required, one associated solely with the interrupt terminals, the other solely with the non-interrupt terminals.

TWO PROCESSOR SWITCH (#8110). For switching the 2702 between two S/360 or S/370 multiplexer channels. **Maximum:** One. **Prerequisite:** In a S/360 mdl 87-2, Remote Switch Attachment (#6148) is required. If the Two Processor Switch is routed through the Configuration Control Panel (#1505) of a multiprocessor S/360 mdl 65 system, Remote Switch Attachment (#6148) is required.

TYPE I TERMINAL INTERRUPT (#8200). Allows the IBM Terminal Control-Type I (#4615) to operate in a bi-directional interrupt mode capability with a 2741 with Transmit Interrupt (#7900) and Receive Interrupt (#4708 on 2741). #4615 may be used with non-interrupt equipped terminals even though #8200 is installed. **Limitation:** Not available if Terminal Control-Type II (#4616) or 2741 Break (#8055) is installed. **Maximum:** One. **Prerequisites:** IBM Terminal Control Type I (#4615) with Selective Speed (#9684) ... If the #4615 is to communicate with 2741s with Transmit Interrupt and any other 134.5 bps terminal, two #9684s are required, one associated solely with the 2741s, and the other solely with the other terminals.

verify compatibility when #8200 is to be added to a 2702 with an installed RPQ.

Special Feature Prices: Before ordering features, consult "Limitations" and individual feature descriptions above. A completed, revised 2702 Specification Sheet, and a copy of the latest preceding specification sheet must be submitted with each order for special features.

	MAC/ MRC	Purchase	MMMC	FIC
Add'l Selective Speed #1065	\$ 16	\$ 786	\$1.00	\$ 39
Autocall Adapter 1290	16	786	1.00	91
Autocall Feature 1310	67	2,960	3.00	321
Autocall Expansion 1311	16	786	1.00	166
Auto Poll 1319	56	2,535	4.00	166
Data Set Line Adapter 3233	21	1,065	3.00	91
Expansion Base 3853	NC	NC	NC	NC
IBM Line Adapter				
134.5 bps 4612	33	1,505	1.00	116
600 bps 4613	33	1,505	1.00	116
IBM Terminal Control -				
Type I 4615	38	1,715	1.00	142
Type II 4616	38	1,715	1.00	142
IBM Line Adapter -				
2-wire 4634	24	1,175	1.00	116
4-wire 4635	24	1,175	1.00	116
Isolation, Control Unit 4700	NC	NC	NC	NC
Remote Switch Attach 6148	NC	NC	NC	NC
Speed Extension 7387	84	3,795	4.00	270
Telegraph Line Adapter 7895	21	1,010	4.00	193
Telegraph Terminal Control -				
Type I 7911	38	1,715	1.00	142
Type II 7912	38	1,715	1.00	142
1032 Attachment 7918	43	1,750	1.00	91
Terminal Control Expans 7935	21	1,065	1.25	91
31 Line Expansion 7955	112	4,965	4.00	321
2741 Break 8055	10	506	1.00	91
Two Processor Switch 8110	84	3,795	3.50	423
Type I Terminal Interrupt 8200	33	1,345	NC	236

2703 TRANSMISSION CONTROL

[No longer available]

Specify: A Cable Order must be submitted for each order where the added feature requires external cable. See S/370 Installation Manual - Physical Planning, SRL GC22-7004 for cabling information.

SPECIAL FEATURES

The following special features are on an "As Available" basis for field installation.

● **LINEBASE FEATURES**

START-STOP BASE TYPE I (#7505). To attach up to 88 half-duplex line appearances (11 Line Set Features) operating up to 165 bps. May be intermixed with Start-Stop Base Type II (#7506) and/or Synchronous Bases Type 1A (#7703), Type 1B (#7704), or Type 2A (#7706). **Maximum:** three ... but total half-duplex line appearances per 2703 cannot exceed 176. **Prerequisite:** The second #7505 installed requires Base Expansion (#1440).

START-STOP BASE TYPE II (#7506). To attach up to 24 half-duplex line appearances (3 Line Set Features) operating up to 600 bps. May be intermixed with Start-Stop Base Type Is (#7505) and/or Synchronous Bases Type 1A (#7703), Type 1B (#7704), or Type 2A (#7706). **Maximum:** Three. [Note: A #7506 may be used to attach features normally attached via #7505, although the limitations for #7506 remain unchanged.] **Prerequisite:** The second #7506 installed requires Base Expansion (#1440).

SYNCHRONOUS ATTACHMENT (#7702). To attach any synchronous lines to a 2703. **Maximum:** One. **Prerequisite:** Base Expansion (#1440).

● **SYNCHRONOUS BASE TYPE 1A (#7703), TYPE 1B (#7704), TYPE 2A (7706).**

#7703 -- to attach up to 24 half-duplex lines (6 Synchronous Line Sets) at bit rates up to 2400 bps using Synchronous Terminal Control (#7715 for EBCDIC or #7716 for ASCII).

#7704 -- to attach up to 16 half-duplex lines (4 Synchronous Line Sets) at bit rates up to 2400 bps using Synchronous Terminal Control (#7717 for 6-bit Transcode), either by itself, or in combination with #7715 or #7716.

#7706 -- to attach up to 12 half-duplex lines (3 Synchronous Line Sets) at bit rates up to 4800 bps using Synchronous Terminal Control (#7715 for EBCDIC, or #7716 for ASCII).

May be intermixed with Start-Stop Base Type I (#7505) and/or Type II (#7506). **Maximum:** Two. **Limitation:** No more than two Synchronous Terminal Controls can be associated with one Synchronous Base. **Prerequisite:** Synchronous Attachment (#7702).

BASE EXPANSION (#1440). Required to attach a Synchronous Attachment (#7702), or more than one Start-Stop Base Type I (#7505) or Type II (#7506). **Maximum:** One.

● **TERMINAL CONTROL FEATURES**

IBM TERMINAL CONTROL BASE (#4619). To attach an IBM Terminal Control Type I (#4696) and/or Type II (#4697). **Maximum:** One. **Prerequisite:** A Start-Stop Base Type I (#7505) or Type II (#7506).

IBM TERMINAL CONTROL TYPE I (#4696). To communicate with 1060s, 1070s, 2740, 2741s, and 5010. Includes vertical and longitudinal checking for 1060/1070/5010 ... the same checking is provided for 2740s if they are equipped with Record Checking (#6114). [Note: 2740s may be attached when equipped with any combination of #6114 and Station Control (#7479), or with neither.] **Maximum:** One. **Prerequisite:** IBM Terminal Control Base (#4619).

2741 BREAK (#8055). Allows the IBM Terminal Control Type I (#4696) to operate with a 2741 equipped with Receive Interrupt (#4708). #4696 may be used independently of this feature even though #8055 is installed. **Note:** All lines on any Line Set Expander to which this feature is applied must operate with this feature. **Maximum:** One. **Limitation:** Not available if Type I Terminal Interrupt (#8200) is installed. **Prerequisites:** IBM Terminal Control Type I (#4696) ... If IBM Line Adapters are used, they must be the 4-wire version.

TYPE I TERMINAL INTERRUPT (#8200). Allows IBM Terminal Control Type I (#4696) to operate in a bi-directional interrupt mode capability with a 2741 equipped with Transmit Interrupt (#7900) and Receive Interrupt (#4708 on 2741). #4696 may be used with non-interrupt equipped terminals even though #8200 is installed. **Maximum:** One. **Limitation:** Not available if 2741 Break (#8055) is installed. **Prerequisites:** IBM Terminal Control Type I (#4696) ... if IBM Line Adapters are used they must be the 4-wire version. verify compatibility when #8200 is to be added to a 2703 with an installed or on-order RPQ.

**2703 Transmission Control (cont'd)**

IBM TERMINAL CONTROL TYPE II (#4697). To communicate with 1030 systems. **Maximum:** One. **Prerequisite:** IBM Terminal Control Base (#4619).

TELEGRAPH TERMINAL CONTROL BASE (#7905). To attach a Telegraph Terminal Control, Type I (#7911) and/or Type II (#7912). **Maximum:** One.

TELEGRAPH TERMINAL CONTROL TYPE I (#7911). To communicate with AT&T 83B2/83B3 or WU 115A terminals. **Maximum:** One. **Specify:** #9129 for downshift on space, if desired. **Prerequisite:** Telegraph Terminal Control Base (#7905).

TELEGRAPH TERMINAL CONTROL TYPE II (#7912). To communicate with TWX Model 33/35 terminals. **Maximum:** One. **Prerequisite:** Telegraph Terminal Control Base (#7905).

TELEGRAPH ATTACHMENT (#7876). To attach Telegraph Line Sets (#7897) ... required when one or more 83B2/83B3, 115A, 2740 mdl 2 lines are attached via Telegraph Line Sets (#7897) ... **NOT** required when 83B2/83B3 and 115A lines are attached via 2712 Remote Multiplexer mdl 2s. **Maximum:** One.

SYNCHRONOUS TERMINAL CONTROL (#7715, 7716, 7717). To communicate with synchronous terminals.

#7715 -- for terminals communicating in EBCDIC code.

#7717 -- for terminals communicating in 6-bit Transcode.

#7716 -- for terminals communicating in non-transparent ASCII code.

#7716/9100 -- for terminals communicating in transparent ASCII code.

Note: Transparency (#9100) modifies the VRC/LRC check to a CRC check, making the #7716/9100 a fourth synchronous terminal control type. Transparency capability is included in the #7715 and #7717 Synchronous Terminal Controls. When transparency is used with any of these codes, there are additional restrictions and limitations which are covered in SRL GA27-3004. **Maximum:** One of each ... three if no IBM Terminal Control Type I (#4696) or Type II (#4697), Telegraph Terminal Control Type I (#7911) or Type II (#7912) is installed ... otherwise, only two. **Prerequisites:** For #7715 or #7716 -- Synchronous Base Type 1A (#7703), Type 1B (#7704) or Type 2A (#7706). For #7717 -- Synchronous Base Type 1B (#7704). Station Selection (#7473) may also be required ... see below.

STATION SELECTION (#7473). Required when one or more lines are assigned to a Synchronous Terminal Control (#7715, 7716, 7717) which is functioning on a leased communications line as a tributary (terminal) station. **Maximum:** One per #7715, 7716, 7717. **Prerequisite:** Synchronous Terminal Control (#7715, 7716, 7717).

● **LINE SET FEATURES** -- All lines in a given line set or line set expander must operate at the same speed (unless clocking is supplied by the data set) over the same type communications facilities with terminals employing the same type of line control; with either business machine or data set clocking, but not a combination.

† **DATA LINE SET (#3205).** For attachment of up to eight line appearances of asynchronous terminals (1030, 1060, 1070, 2740, 2741, 5010 and TWX Model 33/35 type) over facilities C1, C2, D1 or D2 ... or for attachment of up to eight line appearances to a 2711 Line Adapter Unit. **Maximum:** Twelve. **Prerequisites:** Start-Stop Base Type I (#7505) or Type II (#7506) ... Line Speed Option (#4877, 4878 or 4879) as appropriate ... either IBM Terminal Control Base (#4619), or for TWX, Telegraph Terminal Control Base (#7905) ... one of the following: IBM Terminal Control Type I (#4696) or Type II (#4697), or for TWX, Telegraph Terminal Control Type II (#7912).

† **DATA LINE SET EXPANDER (#3206).** Permits attachment of up to eight add'l lines to a Data Line Set (#3205). **Maximum:** One per #3205 ... ten per 2703. **Prerequisite:** One #3205 per #3206.

† **IBM LINE SET 1A (#4686).** Eight limited distance IBM line adapters for 2-wire local use up to 4.75 wire-miles each over facility G1. See Limited Distance Line Adapter Type I in SRL GA24-3435†† for specifications and restrictions. To attach up to eight half-duplex line appearances accommodating 2740/2741 terminals. **Limitation:** Cannot be installed if any IBM Line Set 2s (#4688) are installed. **Maximum:** Total number of #4686s and IBM Line Adapter 1Bs (#4687) cannot exceed twelve. **Prerequisites:** Start-Stop Base Type I (#7505) or Type II (#7506) ... Line Speed Option (#4878) for 134.5 bps ... IBM Terminal Control Base (#4619) ... IBM Terminal Control Type I (#4696) ... for more than nine #4686s, an add'l #7505 or #7506 and its prerequisites.

† **IBM LINE SET 1B (#4687).** Eight limited distance line adapters for 4-wire local use (up to 4.75 wire-miles) over facility G1. See Limited Distance Line Adapter Type I in SRL GA24-3435†† for specifications and restrictions. To attach up to eight line appearan-

ces accommodating 2740/2741 terminals. **Limitation:** Cannot be installed if any IBM Line Set 2s (#4688) are installed. **Maximum:** Total number of #4687s and IBM Line Set 1As (#4686) installed cannot exceed twelve. **Prerequisites:** Same as for #4686.

†† **IBM LINE SET 2 (#4688).** Eight limited distance line adapters for 2-wire local use (up to 8 wire-miles each) over facility G2. See Limited Distance Line Adapter Type 2 in SRL GA24-3435†† for specifications and restrictions. To attach up to eight half-duplex line appearances accommodating 1030/1060/1070/2740/2741/5010 systems and terminals. **Limitation:** Cannot be installed if any IBM Line Set 1As (#4686) or 1Bs (#4687) are installed. **Maximum:** Four. **Prerequisites:** Start-Stop Base Type I (#7505) or Type II (#7506) ... Line Speed Option (#4878 for 134.5 bps, or #4879 for 600 bps) ... IBM Terminal Control Base (#4619) ... IBM Terminal Control Type I (#4696) or Type II (#4697).

† **TELEGRAPH LINE SET (#7897).** For attachment of up to eight line appearances via facilities A1, A2 or A3 ... interfaces AT&T 83B2/83B3 and WU Plan 115A terminals, or at 75 bps, 1050 or 2740 mdl 2 terminals. **Maximum:** Twelve. **Caution:** When operating TWO 2703s with #7897s in series on the same telegraph current loop, RPQ - must be applied to one 2703 and RPQ must be applied to the other 2703. These RPQs are **NOT** required for a single 2703 operating two telegraph line appearances on the same telegraph current loop. **Prerequisites:** Start-Stop Base Type I (#7505) or Type II (#7506) ... Line Speed Option (#4873, 4874, 4875 or 4876) as appropriate ... Telegraph Terminal Control Base (#7905) ... Telegraph Terminal Control Type I (#7911) ... Telegraph Attachment (#7876).

† **TELEGRAPH LINE SET EXPANDER (#7898).** For attachment of up to eight add'l lines to a Telegraph Line Set (#7897). **Maximum:** One #7898 per #7897 ... ten per 2703. **Prerequisite:** A Telegraph Line Set (#7897) for each #7898.

† **SYNCHRONOUS LINE SET (#7710).** For attachment of up to four synchronous line appearances via facilities C4, C5, C6, D3, D4, D4SB, D5 or D5SB ... accommodates 2701s and 2703s with S/360/370s, System/3s with #2074, S/360 mdl 20s with #2074, S/360 mdl 25s with #4580 and #7551 or #7552, 1130s with #7690, 2715 mdl 2s, 2770s, 1800s with #7550, 2780s and 3780s. **Maximum:** Six per Synchronous Base Type 1A (#7703) ... four per Type 1B (#7704) ... three per Type 2A (#7706) ... twelve per 2703. **Limitation:** See Synchronous Clock (#7705). **Prerequisites:** Base Expansion (#1440) ... Synchronous Attachment (#7702) ... Synchronous Base Type 1A (#7703), Type 1B (#7704) or Type 2A (#7706) ... Synchronous Terminal Control (#7715, 7716 or 7717). Synchronous Clock (#7705) may be required.

SYNCHRONOUS CLOCK (#7705). Required for attachment of facilities C4, D3 ... each #7705 permits attachment of up to four such facilities. **Limitation:** The maximum number of Synchronous Line Sets (#7710) is reduced when any #7705s are installed ... see "General Limitation" below. **Maximum:** One per each #7710 ... three per Synchronous Base Type 1A (#7703), Type 1B (#7704) or Type 2A (#7706) ... six per 2703. **Prerequisites:** Synchronous Line Set (#7710) ... Synchronous Line Speed Option (#7711).

● **SPEED OPTIONS**● **ASYNCHRONOUS DEVICES**

LINE SPEED OPTION (#4873-4879). Defines the line speed available for asynchronous features on the 2703. **Maximum:** Seven, one of each of the following:

#4873 -- 45.5 bps for common carrier half-duplex

#4874 -- 56.9 bps telegraph service

#4875 -- 74.2 bps

#4876 -- 75 bps for 2740 mdl 2s connected via telegraph channels

#4877 -- 110 bps for TWX

#4878 -- 134.5 bps for 1060 systems, 2740/2741 terminals, 1070 systems or 5010 not requiring 600 bps

#4879 -- 600 bps for 1030 systems, and 2740 mdl 2s, 1070 systems or 5010 requiring 600 bps.

● **SYNCHRONOUS DEVICES**

SYNCHRONOUS LINE SPEED OPTION (#7711). Defines the 1200 bps synchronous line speed for Synchronous Clock(s) (#7705). **Note:** This option may not be used with any Synchronous Line Set on which a data set clocked line appears. **Maximum:** One per 2703

● **AUTOCALL FEATURES**

AUTOCALL (#1340 for first, #1341 for second). Each provides

† For further information, see M 2700 pages.

†† SRL GA24-3435-2, or subsequent revisions.



2703 Transmission Control (cont'd)

up to eight line appearances of a given Data Line Set (#3205) or Data Line Set Expander (#3206), or two Synchronous Line Sets (#7710), with automatic calling capability. For attachment to facilities C4, C5 or C6.

When using #1340 or #1341 with a Synchronous Line Set, a first or second autocall feature may be associated with two Synchronous Line Sets (eight binary synchronous communications lines) if both #7710s are on the same Synchronous Base, have consecutive addresses, and the first begins on a base address boundary which is a multiple of eight. **Maximum:** One of each. **Prerequisites:** One Data Line Set (#3205) or Data Line Set Expander (#3206) for each #1340 or #1341 ... or one or two Synchronous Line Sets (#7710) for each #1340 or #1341 ... #1341 requires #1340.

●TWO PROCESSOR ATTACHMENT FEATURE

TWO PROCESSOR SWITCH (#8110). For switching the 2703 channel interface between two S/360 or S/370 multiplexer channels. **Maximum:** One. **Prerequisite:** Emergency Power-Off Control on attached processing units.

●ISOLATION FEATURE

ISOLATION, CONTROL UNIT (#4700). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2703 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements.

GENERAL LIMITATION

Combinations of the following features may not exceed a total assigned weight of nine (9) per Start-Stop Base Type I (#7505) or Type II (#7506) and six (6) per Synchronous Base Type 1A (#7703), Type 1B (#7704) or Type 2A (#7706). Due to this limitation, it may be necessary to order three Start-Stop Base Type Is (#7505) with some unusual configurations.

Feature	Assigned Weight
Data Line Set (#3205)	1
Data Line Set Expander (#3206)	0
Telegraph Line Set (#7897)	1
Telegraph Line Set Expander (#7898)	0
IBM Line Set 1A (#4686)	1
IBM Line Set 1B (#4687)	1
IBM Line Set 2 (#4688)	2
Synchronous Line Set (#7710)	1
Synchronous Clock (#7705)	1

● **Special Feature Prices:** Before ordering, consult individual feature description and "General Limitation" above. A completed, revised 2703 Specification Sheet, (or later), and a copy of the latest preceding specification sheet must be submitted with each order for special features.

MAC/
MRC Purchase MMMC FIC

●LINE BASE FEATURES

Start-Stop Base Type I	#7505	\$ 81	\$ 3,795	\$ 4.50	\$ 805
Start-Stop Base Type II	7506	81	3,795	4.50	805
Synchronous Attachment	7702	524	21,710	10.00	1,110
Synch Base Type 1A	7703	156	6,530	4.50	789
Synch Base Type 1B	7705	156	6,530	5.00	789
Synch Base Type 2A	7706	288	13,000	4.50	239
Base Expansion	1440	81	3,795	4.00	318

●TERMINAL CONTROL FEATURES

IBM Term Control Base	4619	21	1,065	1.25	348
IBM Term Control Type I	4696	37	1,715	1.00	87
2741 Break	8055	10	506	1.00	44
Type I Terminal Interrupt	8200	65	2,615	NC	159
IBM Term Cntrl Type II	4697	37	1,715	1.00	80
Tele Term Cntrl Base	7905	21	1,065	1.25	278
Tele Term Cntrl Type I	7911	37	1,715	1.00	95
Tele Term Cntrl Type II	7912	37	1,715	1.00	87
Telegraph Attachment	7876	48	2,270	4.50	111
Synchronous Terminal Control					
EBCDIC code	7715	104	4,345	3.00	420
ASCII code	7716	104	4,345	3.00	474**
6-Bit Transcode	7717	104	4,345	3.00	420
Station Selection	7473	52	1,680	.50	106

●LINE SET FEATURES

Data Line Set	3205	81	3,510	12.00	589
Data Line Set Expander	3206	59	2,475	8.50	143
IBM Line Set 1A	4686	101	4,275	4.00	425
IBM Line Set 1B	4687	101	4,275	4.00	441
IBM Line Set 2	4688	156	7,280	5.50	640
Telegraph Line Set	7897	90	3,940	16.50	455
Tele Line Set Expander	7898	70	2,905	13.50	148
Synchronous Line Set	7710	421	17,410	4.50	445
Synchronous Clock	7705	63	2,605	2.50	280

●SPEED OPTIONS

Line Speed Option (asynchronous)					
45.5 bps	4873	10	533	1.00	34
56.9 bps	4874	10	533	1.00	34
74.2 bps	4875	10	533	1.00	34
75 bps	4876	10	533	1.00	34
110 bps	4877	10	533	1.00	34
134.5 bps	4878	10	533	1.00	34
600 bps	4879	10	533	1.00	34
Synch Line Speed Option	7711	16	674	.50	30

●AUTOCALL FEATURES

Autocall -- first	1340	129	6,080	7.00	511
Autocall -- second	1341	129	6,080	7.00	425

●TWO PROCESSOR ATTACHMENT FEATURE

Two Processor Switch	8110	81	3,795	3.50	830
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●ISOLATION FEATURE

Isolation, Control Unit	4700	NC	NC	NC	NC
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** Add \$189 when Full Transparency (#9100) is specified.



2711 LINE ADAPTER UNIT

Purpose: Unit for attachment to 2025 Processing unit(s) equipped with an Integrated Communications Attachment, 3135, 3135-3, 3138 Processing Unit(s) equipped with an Integrated Communications Adapter and/or 2702/2703 Transmission Control(s), and/or 3704/3705 Communications Controller. It provides for the addition of IBM Line Adapters for a 2025 or 3135, 3135-3, 3138 using an ICA feature and attachment of additional IBM Line Adapters for 2702s/2703s/3704s/3705s. The IBM Line Adapters serve as modems for use on appropriate communications facilities, permitting communications with similarly equipped IBM terminals.

Highlights: A modular unit ... provides for installation of up to thirty-two IBM Line Adapters. See "Special Features" below. These adapters are for use by the attached 2702/2703/3704/3705(s). They provide for modulating and demodulating signals over communications facilities in a manner similar to common carrier data sets that would otherwise be required for those functions. Thus, when IBM Line Adapters are used, common carrier data sets are not required.

Three types of IBM Line Adapters can be installed to provide for: limited distance (8 wire-miles) communications ... communications over privately owned or leased common carrier facilities, and/or ... the equivalent of up to four independent low speed channels from a single voice grade channel (each low speed channel may be operated point-to-point or multipoint).

The basic 2711 accommodates up to four IBM Line Adapters, in any combination ... for more than four, Line Adapter Modules (#4794) are required. Each #4794 permits attachment of up to four additional IBM Line Adapters, in any combination. A maximum of seven #4794s can be installed, for a total of thirty-two IBM Line Adapters per 2711 ... see "Special Features" below.

Communications Facilities: The 2711, when equipped with appropriate IBM Line Adapter(s), can attach to common carrier leased private line telephone channels or privately owned communications facilities conforming to the specifications described in SRL GA24-3435* under: Limited Distance Line Adapter, Type 2 ... Leased Line Adapter, or ... Shared Line Adapter.

Attachment to Communications Lines: Attachment to communications facilities conforming to the specifications above is via the appropriate IBM Line Adapter(s) for the type(s) of communications service being used ... see "Special Features" below.

Customer Responsibilities: See M 2700 pages.

PREREQUISITES:

Attachment to 2025 -- attachment is made via the Integrated Communications Attachment (#4580) on a per line basis to EIA Start/Stop Data Adapters ... see 2025. NOTE: In a S/360 mdl 25, attachment can also be made via a 2702 or 2703 ... see below.

Attachment to 3135, 3135-3, 3138 -- attachment is made via the Integrated Communications Adapter (#4640) on a per line basis, to a Terminal Adapter Type I Model I (#9721-9728) ... see 3135, 3135-3, 3138. LIMITATION: Only IBM Line Adapter (#4647) is supported ... see "Special Features". NOTE: In a S/370 mdl 135, 135-3, 138, attachment can also be made via a 2702 or 2703 ... see below.

Attachment to 2702 -- attachment is made on a per line basis to the Data Set Line Adapter (#3233) on the 2702 ... see 2702.

Attachment to 2703 -- attachment is made on a per line basis for up to eight lines to each Data Line Set (#3205) or Data Line Set Expander (#3206) ... see 2703.

Attachment to 3704/3705 -- attachment is made on a per line basis to Line Set Type 1A or 1D (#4711 or #4714).

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Line Assignments: Must be specified on 2711 Line Assignment Form (120-1468).

[4] A Cable Order must be submitted for: (a) Each new machine order ... (b) Each order where the added feature requires external cable. See S/370 Installation Manual - Physical Planning, GC22-7004, for cabling information.

Table with 5 columns: Prices, Mdl, MAC/MRC, Purchase, MMMC. Row 1: 2711, 1, \$ 145, \$ 6,610, \$24.00

Plan Offering: Plan B Purchase Option: 50% Maintenance: B Warranty: B Per Call: 3

Limitations: Up to thirty-two of the IBM Line Adapters below, in

any combination, can be installed ... operation with 1030 or 2741 [with Interrupt (#4708)] is limited to the 4-wire versions of the leased line adapter (#4647) or shared line adapters (#4691, 4692, 4693 or 4694).

SPECIAL FEATURES

† IBM LINE ADAPTER (#4790). A modem for 2-wire limited distance use (up to 8 wire-miles). Line turnaround time is approximately 12 ms ... see Limited Distance Line Adapter, Type 2 in SRL GA24-3435* for specifications and restrictions. For operation with similarly equipped 1030/1050/1060/1070 systems and 2740/2741 terminals at speeds up to 600 bps. Limitations: See below. Prerequisite: An available position in the basic unit or in a Line Adapter Module (#4794).

† IBM LINE ADAPTER (#4639 for 2-wire, #4647 for 4-wire). A modem for leased common carrier or privately owned voice grade facilities. Line turnaround time is approximately 200 ms for #4639 and 20 ms for #4647, both plus line propagation time ... see Leased Line Adapter in SRL GA24-3435* for specifications and restrictions. For operation with similarly equipped 1030/1060 systems and 2740/2741 terminals at speeds up to 600 bps, as applicable. There is no limitation on the length of the communications line that can be served, if it conforms to the specifications in SRL GA24-3435*. Limitations: See above. Prerequisite: An available position in the basic unit or in a Line Adapter Module (#4794).

† IBM LINE ADAPTER (#4641-4644 for 2-wire, #4691-4694 for 4-wire). A modem for shared use of a leased common carrier or privately owned voice grade facility. Line turnaround time is approximately 200 ms for #4641-4644 and 20 ms for #4691-4694, both plus line propagation time ... see Shared Line Adapter in SRL GA24-3435* for specifications and restrictions. For operation with similarly equipped 1060 systems and 2740/2741 terminals at speeds up to 134.5 bps. When used, a single leased telephone line can provide up to four independent 134.5 bps "subchannels" ... the equivalent of up to four low-speed lines from a single voice grade channel. Each "subchannel" is obtained through use of one of the four shared line adapters. Thus, to operate four "subchannels" on a single telephone channel, four line adapters (#4641 thru #4644) for a 2-wire channel, or (#4691 thru #4694) for a 4-wire channel are required. Limitations: See above. Prerequisite: Each line adapter requires an available position in the basic unit or in a Line Adapter Module (#4794). Ordering: The terminal with which each "subchannel" on the 2711 is to communicate must be equipped with the same shared line adapter, i.e., the same feature #. Line adapters for use with each different leased telephone channel must be ordered in sequence, as follows:

Table with 3 columns: 2-wire, 4-wire. Rows: For subchannel 1, 2, 3, 4 with corresponding part numbers.

** Subchannel 1 is prerequisite for installation of higher numbered subchannels, unless Shared Line Adapter 4/1 Terminator (#6350) is ordered.

LINE ADAPTER MODULE (#4794). For attachment of up to four additional IBM Line Adapters ... any of those above, in any combination. Maximum: Seven.

SHARED LINE ADAPTER 4/1 TERMINATOR (#6350). A pluggable device for physically attaching up to four different 2-wire IBM shared line adapters (#4641-4644) or up to four different 4-wire IBM shared line adapters (#4691-4694) to a single 404B Telephone Co. line terminating jack ... see Shared Line Adapter installation practices in SRL GA24-3435*. Prerequisite: The appropriate IBM Line Adapters (#4641-4644) or (#4691-4694).

Table with 6 columns: Special Feature Prices, MAC/MRC, Purchase, MMMC, FIC. Rows include IBM Line Adapter (Limited Distance, Leased Line, Shared Line) and Line Adapter Module 4/1 Terminator.

* SRL GA24-3435-2, or subsequent revisions.

† For further information on IBM Line Adapters, see M 2700 pages.



2715 TRANSMISSION CONTROL UNIT

[no longer available]

The following specifications can be changed in the field.

- Specify:** [1] Voltage (AC, 3-phase, 4-wire, 60 Hz, locking plug): #9884 for 208 V, or #9886 for 230 V.
- [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- [3] Cabling: #9080 for below floor, or #9081 for on floor.
- [4] When Extended Distance Repeater, Receive or Send (#3874, 3875) is ordered, #9486 must be specified for 2715s having serial no. 10071 or below.
- [5] If any Extended Distance Repeater, Receive or Send (#3874, 3875) features are used in the 2790 system, #9548 (oscillator change) must be specified on each 2791 mdl 1 or 2 or 2793 in the system. See feature description under 2791 or 2793 for prerequisites.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
2715	1	\$1,740	\$67,240	\$221
	2	1,740	67,240	221

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Maintenance: B Per Call: 2 Purchase Option: 50%
 Metering: I/O Unit (Online/Offline)
 Warranty: B Useful Life Category: 2

SPECIAL FEATURES

The following special features are on an "as available" basis for field installation.

DUAL COMMUNICATIONS INTERFACE (#3460). [Model 2 only] Provides a switched interface which allows the BSC adapter to be manually switched between two types of communications lines for back-up purposes. **Maximum:** One. **Limitation:** This feature does not provide the capability to operate two lines simultaneously.

EXPANDED CAPABILITY (#3801). Provides the system with an additional 16K of control storage for a system total of 32K. Required for a maximum device configuration on a 2715, for control of the External Alarm Contacts (#3690) feature on attached 2791/2793 Area Stations, 2798 Guidance Display Units, or 2792 Remote Communications Controllers, and for message routing independent of host CPU intervention. **Maximum:** One.

EXTENDED DISTANCE REPEATER, RECEIVE (#3874). Provides for operation with a 2791 or 2793 Area Station equipped with Extended Distance Repeater, Send (#3875) located up to 6,000 wire-feet away. See Physical Planning Manual, GA27-3017, for cable specifications. **Maximum:** Four. **Limitations:** See "Limitations" for Extended Distance Repeater, Send (#3875) below. **Prerequisites:** Extended Distance Repeater, Send (#3875) on the "up-line" 2791/2793. Also see "Specify" [4] and [5].

EXTENDED DISTANCE REPEATER, SEND (#3875). Provides for operation with a 2791/2793 Area Station equipped with Extended Distance Repeater, Receive (#3874) located up to 6,000 wire-feet away. See Physical Planning Manual, GA27-3017, for cable specifications. **Maximum:** Four. **Limitations:** [1] The use of two pairs of Extended Distance Repeaters, Receive/Send (#3874, 3875) in tandem is not recommended. If the Area Station having both Receive and Send Repeater features should fail, the entire segment would be inactive. [2] Maximum of eight pairs per transmission line attached to the 2715. Maximum of two pairs may be used on a secondary loop attached to a 2792. [3] In the 2715, each of the four segments may include (a) EDR, Send (#3875) only, or, (b) EDR, Send (#3875) and EDR, Receive (#3874); EDR, Receive (#3874) only is not available. **Prerequisites:** Extended Distance Repeater, Receive (#3874) on the "down-line" 2791/2793. Also see "Specify" [4] and [5].

LINE TRANSFER SWITCH (#4750). To manually switch the 2790 transmission lines between two adjacent 2715s acting as back-up for each other. All terminals must be defined identically in the user tables of both 2715s affected. **Limitation:** When switching from one system to another, the total number of terminals allowed cannot exceed the maximum number allowable on one 2715. **Maximum:** One. **Note:** This feature is required on only one of the two 2715s.

LINE TRANSFER SWITCH - THIRD UNIT (#4751). To use a third 2715 as back-up for either of two other 2715s. All terminals must be defined identically in the user tables of both 2715s affected. **Limitation:** When switching from one system to another, the total number of terminals allowed cannot exceed the maximum number allowable on one 2715. **Maximum:** One. **Prerequisites:** The two primary 2715s must each be equipped with Line Transfer Switch (#4750) ... the third (back-up) 2715 requires only #4751.

LOCAL 2740 ADAPTER (#4850). [Model 1 only ... standard on

Model 2] For local attachment of a 2740 Communications Terminal mdl 1 ... 2740 must be located within 40 wire-feet of the 2715. **Maximum:** One. **Prerequisites:** the 2740 must be equipped with 2715 Attachment (#9715), Dial Up (#3255), and Print Element (#9592) ... no other special features may be installed on the 2740. No data set is required.

SYNCHRONOUS CLOCK (#7705). [Model 2 only] An internal clock for use with data sets which do not provide clocks. See M 2700 pages for facilities that require this feature. **Maximum:** One.

TWO PROCESSOR SWITCH (#8110). [Model 1 only] To switch the 2715 mdl 1 between two S/360 or S/370 multiplexer channels. **Maximum:** One.

MODEMS -- one IBM Modem can be attached to a 2715 mdl 2 only. Two IBM Modems can be attached with Dual Communications Interface (#3460) installed.

Modem	Speed (bps)
3872 mdl 1	2400
3874	4800

Note: For communications capabilities, product utilization and special features, see M 2700, 3872 and 3874 pages.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC	
Dual Commun Interface #3460	\$ 37	\$ 1,470	\$.50	\$283	
Expanded Capability 3801	325	12,580	12.50	319	
Extended Distance Repeater, Receive	3874	13	520	2.50	49
Send	3875	14	520	2.50	49
Line Transfer Switch	4750	16	650	.50	114
Line Trans Sw - 3rd Unit	4751	16	650	.50	114
Local 2740 Adapter	4850	102	3,995	4.00	332
Synchronous Clock	7705	42	1,675	.50	211
Two Processor Switch	8110	91	3,570	8.50	241

2740 COMMUNICATIONS TERMINAL

Purpose: A Selectric® typewriter terminal (printer/keyboard) for transmission of data or text to or from another terminal or data processing system.

NOTE: For possible use with Series/1, see GSD manual.

- Model 1** Keyboard/printer terminal for transmission to or from another 2740 mdl 1, or to or from a S/360 mdl 22 thru 85, 195, or any S/370 or 4300 Processor ... see "Communications Facilities" and "Prerequisites" below. Also attaches directly to a 2715 Transmission Control for keyboard input or printed output ... see "Prerequisites" below.
- Model 2** Buffered keyboard/printer terminal for transmission to or from a S/360 mdl 22 thru 85, 195, or any S/370 or 4300 Processor ... see "Communication Facilities" and "Prerequisites" below.

Model Changes: Cannot be made in the field.

Highlights: The unit's Selectric typewriter provides the optimum in operator/machine relationship. Special features available permit tailoring of terminals to the requirements of a specific work station.

System control keys and indicator lights, located conveniently alongside the keyboard, make it a compact console-like unit. When not used for data transmission, the typewriter may be used for office typing. [NOTE: There are basic design differences in the 2740 which will result in a different printing output than the Selectric typewriter. Customers with applications requiring critical printing must be directed to evaluate 2740 output capability in light of their own needs.

Model 1 -- code and system capability permit transmission to or from other 2740 mdl 1s, or to or from a suitably equipped S/360, S/370 or 4300 Processor ... see *System Application*, under "Specify" below.

Model 2 -- code and system application permit transmission to or from a suitably equipped S/360, S/370 or 4300 Processor. The basic unit has a 120-position magnetic core buffer. Data entered from the keyboard can be stored and visually verified before transmission to the S/360, S/370 or 4300 Processor. Data from the S/360, S/370 or 4300 Processor is received directly by the printer, except when the unit is equipped with Buffer Receive (#1499) ... see "Special Features." This model also includes the functions provided by Station Control (#7479) on the model 1.

Communication Facilities: Either model operates in half duplex mode over the following facilities at the speeds indicated. For information concerning the facilities, see the M 2700 pages.

- Model 1** At 134.5 bps via facility C1, C2, D1, G1 or G2.
- Model 2** At 75 bps via facility A4.
At 134.5 bps via facility D1, G1 or G2.
At 600 bps via facility D2 or G2.

Note: For attachment to facility A4, the channels must be capable of 75 bps operation, use non-code sensitive regenerators and a 9-bit character code, and be terminated in a 62.5 ma neutral DC loop of the terminal.

Also see Data Set Attachment under "Specify" for required facility specification code. On appropriate lines, IBM Line Adapters may be used in lieu of data sets ... see "Special Features." IBM Line Adapters and line sets cannot be mixed on the same circuit.

PREREQUISITES:

Attachment to a 2715 Transmission Control Unit (mdl 1 only) -- requires a 2715 mdl 2, or a 2715 mdl 1 equipped with a Local 2740 Adapter (#4850) ... 2715 Attachment (#9715) is also required on the 2740 mdl 1 itself. See "Specify" below.

Communication with another 2740 (mdl 1 only) -- System Application (#9701) is required on each 2740 ... in addition, the same Data Attachment is required on each 2740. See "Specify" below.

Communication with a S/360 mdl 25 -- via the Integrated Communications Attachment (#4580) with appropriate features on the 2025 ... see "Special Features" under 2025. **NOTE:** Communication with a S/360 mdl 25 may also be via a 2701, 2702 or 2703.

Communication with a S/370 mdl 115, 125, 135, 135-3, 138 -- via the Integrated Communications Adapter (#4640) on the 3115, 3125, 3135, 3135-3, 3138. Also, a 2701, 2702, 2703, 3704 or 3705 can be used ... see below.

Communication with a S/360 mdl 22 thru 85, 195 or any S/370 Processor -- via a 2701 Data Adapter Unit or 2702/2703 Transmission Control equipped with appropriate features ... see 2701, 2702, 2703.

Communication with a S/360 mdl 30 thru 195 (except mdl 44, 67 in TSS Mode, 85 or 91), or any S/370 Processor -- via a 3704 or 3705 Communications Controller. **NOTE:** See 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

Communication with a 4300 Processor -- via a 2701, 3704 or 3705 to all 4300 Processors and via the Communications Adapter feature on the 4331. See 2701, 3704, 3705, 4331 and 4341 pages for details and prerequisites.

Customer Responsibilities: See M 2700 pages.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V. If a 2740 is to be installed on a raised floor, specify Moisture Proof Plug -- #9902 for 208 V, or #9904 for 230 V. [NOTE: Consideration of voltage must be made independently of CPU voltage and should be specified only after checking available voltage at terminal location.]

[2] Printing Element: One element is supplied .. see "Type Catalog," page TC 21, etc., for available PTTC/BCD, PTTC/EBCD and standard OPD Selectric elements available, feature #s, and prices of additional elements. The element specified determines the keyboard arrangement. [NOTE: The byte structure of the standard OPD Selectric character set differs from that for PTTC/BCD or PTTC/EBCD character sets. The 2740 mdl 1 or 2 is not Type I programming supported on S/360 with any standard OPD Selectric elements. Standard OPD Selectric elements are not available for the 2740 mdl 2.]

[3] Character Spacing: #9104 for 10 characters/inch, or #9105 for 12 characters/inch. [NOTE: #9105 is not recommended unless a 12-pitch element is specified ... intermixing of character spacing on terminals in any one system should be avoided ... character spacing cannot be changed in the field.]

[4] Line Feeding: #9435 for 6 lines/inch, or #9436 for 8 lines/inch. If a Pin Feed Platen is desired in lieu of the standard friction feed platen, see "Special Features" below. #9435 or #9436 must be specified even though a Pin Feed Platen is ordered.

[5] Data Set Attachment: Unless an IBM Line Adapter, Telegraph Line Attachment (#7807), or 2715 Attachment (#9715) is specified, one of the following must be specified, depending upon the facility to be used.

#9114 -- [mdl 1 only] for facility C1 or C2. **PREREQUISITE:** Dial Up (#3255) ... see "Special Features."

#9115, #9116 or #9120 for facility D1M. See this facility in the M 2700 pages for applicability of these codes.

#9121 -- for facility D2. **PREREQUISITE:** Speed Base - 600 BPS (#7106) ... see "Special Features."

See M 2700 pages for information on these communication facilities.

[6] System Application (mdl 1 only): #9700 for terminal-to-multiplexer system (except 2715), or #9701 for terminal-to-terminal.

[7] 2715 Attachment (mdl 1 only): #9715 ... required for attachment to a 2715. **PREREQUISITE:** Dial Up (#3255) and Print Element (#9592). Cable for the 2740 must be ordered on the 2715 Cable Order Form. **LIMITATION:** When attached to a 2715, Dial Up (#3255) is the only special feature that can be installed on the 2740.

PRICES:	Mdl	MAC/ MRC	Purchase	MMM
	2740	1	\$ 105	\$3,400
		2	162	\$5,210
				\$39.00

Plan Offering: Plan B Purchase Option: 40% Maintenance: B
Warranty: B Per Call: 1

SPECIAL FEATURES

• For Either Model

† **IBM LINE ADAPTER (#4634 for 2-wire, #4635 for 4-wire).** A modem for local use up to 4.75 wire-miles over facility G1. See Limited Distance Line Adapter, Type 1 in SRL GA24-3435** for specifications and restrictions. **Note:** Operation with a 2712 Remote Multiplexer requires #4635.

† **IBM LINE ADAPTER (#4639 for 2-wire, #4647 for 4-wire).** A modem for leased or privately owned voice grade use (facility D1 or D2). See Leased Line Adapter in SRL GA24-3435** for speci-

* or equivalent.

** SRL GA24-3435-2 or subsequent revisions.

† For further information, see M 2700 pages.



2740 Communications Terminal (cont'd)

fications and restrictions. **Limitation:** For point-to-point terminal-to-multiplexer operation, #4647 cannot be used on the 2740 mdl 1 when the multiplexer is operated in continuous carrier mode.

† **IBM LINE ADAPTER (#4641-4644 for 2-wire, #4691-4694 for 4-wire).** A modem for shared use of a type 3002 Private Line Service* or privately owned voice grade facility (facility D1). See Shared Line Adapter in SRL GA24-3435** for specifications, use and restrictions. When used, a single voice grade line can provide up to four independent "subchannels" ... the equivalent of up to four independent low-speed lines from a single voice grade line. Each "subchannel" operates on a separate frequency and simultaneous data flow is possible on all four "subchannels", either on a point-to-point or multipoint basis.

- 2-wire** #4641 -- for subchannel 1 #4643 -- for subchannel 3
#4642 -- for subchannel 2 #4644 -- for subchannel 4
- 4-wire** #4691 -- for subchannel 1 #4693 -- for subchannel 3
#4692 -- for subchannel 2 #4694 -- for subchannel 4

Maximum: One per 2740. **Prerequisite:** All units expected to communicate directly with each other must be on the same "subchannel", i.e., must be equipped with the same shared line adapter (same feature #) ... it is recommended that that if no more than two "subchannels" are required on a line facility, that #4641 and #4642, or #4691 and #4692 be used. **Limitation:** For point-to-point terminal-to-multiplexer operation, #4691-#4694 cannot be used on the 2740 mdl 1 when the multiplexer is operated in continuous carrier mode.

† **IBM LINE ADAPTER (#4790).** A modem for 2-wire limited distance use up to 8 wire-miles at speeds up to 600 bps over facility G2. See Limited Distance Line Adapter, Type 2B, in SRL GA24-3435** for specifications and restrictions.

PIN FEED PLATEN (#9509). [Purchase only] For Plant Installation -- specify #9509 ... maximum one, in lieu of standard friction feed platen. See "Pin Feed Platens" on M 10000 pages for available options, feature #s to be specified and price. For Field Installation -- to order add'l platens or order one for field installation. **Limitation:** Cannot be used if Document Insertion (#3401 or #3402) is installed.

RECORD CHECKING (#6114). Provides a combination of characters (parity) checking and block (longitudinal redundancy) checking.

• **For Model 1 Only**

AUTOMATIC EOB (#1313). Provides an automatic EOB (End Of Block) code following the carriage return code upon depression of the carriage return key. **Prerequisite:** Record Checking (#6114).

DIAL UP (#3255). Required when a dial data set is used, i.e., when Data Set Attachment (#9114) is specified. **Limitation:** Cannot be used with Station Control (#7479).

STATION CONTROL (#7479). Gives the terminals the ability to react to a poll or address from a multiplexer. The polling scheme employs a "character + space" poll or address. The addressing sequence is identified by the "start of address" (comma) character. **Limitation:** Cannot be used with Dial Up (#3255) or 2760 Attachment (#8301). [Note: The functions provided by this feature on a mdl 1 are standard on the mdl 2.]

TRANSMIT CONTROL (#8028). Gives the terminal the ability to respond to a 2-character control code sequence from a multiplexer and to switch from a standby condition to a transmit condition. **Limitation:** Cannot be used with a 2760 Attachment (#8301). **Prerequisite:** Dial Up (#3255).

2760 ATTACHMENT (#8301). To attach a 2760 Optical Image Unit. A PTTC/BCD or PTTC/EBCD Data 1 or Data 2 type font printing element must be specified with this feature. See "Type Catalog", page 23, for feature #s. **Limitations:** Can be field installed only on units serial No. 15000 or above ... cannot be installed with Station Control (#7479) or Transmit Control (#8028). **Prerequisite:** Record Checking (#6114).

• **For Model 2 Only**

BUFFER EXPANSION (#1495, 1496). To increase the capacity of the basic 120-position magnetic core buffer. #1495 -- for positions 121 to 248 ... #1496 -- for positions 249 to 440. **Prerequisite:** #1496 requires #1495.

BUFFER RECEIVE (#1499). Permits data to enter the buffer from the communication line in lieu of going directly to the printer. Incoming data is stored until an EOT is received ... terminal then automatically goes to a receive buffer print state and prints out the contents of the buffer.

DOCUMENT INSERTION (#3401, 3402). [Plant installation only] For insertion of single part ledger cards in front of the typewriter platen without using the platen knobs. See SRL GA24-3403 for details on portions of ledger cards which cannot be used for printing. Manual positioning is required for each new print line. Includes controls and lights necessary for a Split Friction Feed Platen (#9600). **Maximum:** One, #3401 or #3402. **Limitation:**

Pin Feed Platen (#9509) cannot be used if this feature is installed.

#3401 -- accepts a ledger card 6" wide (maximum), with a minus 1/32" tolerance, and length of at least 5". With a 10-pitch printing element, 25 characters may be printed before printing on the ledger begins ... with a 12-pitch element, 30 characters. The 26th character (10-pitch) and 31st (12-pitch) are not printable on the ledger card. The 27th (10-pitch) and 32nd (12-pitch) will be the first printable character and the 85th (10-pitch) and 102nd (12-pitch) last printable character on the ledger card.

#3402 -- accepts a ledger card 7-3/8" wide (maximum), with minus 1/32" tolerance, and a length of at least 5". With a 10-pitch printing element, 55 characters may be printed before printing on the ledger begins ... with a 12-pitch element, 66 characters. The 56th character (10-pitch) and 67th (12-pitch) are not printable on the ledger card. The 57th (10-pitch) and 68th (12-pitch) will be the first printable character and the 129th (10-pitch) and 155th (12-pitch) the last printable character on the ledger card.

EDIT (#3600). Helps in error correction of keyboard-entered data. Provides two additional keys, Line Return and Line Type, for operator use in making corrections.

HEADER CONTROL (#4510). Permits customer designation of the first 28 positions of the buffer (in groups of 4 positions) for repetitive header information. Under switch control, keyed data may be entered into the header area and played back for verification. Header is transmitted each time the buffer is read out of the line. The header size (4, 8, 12, 16, 20, 24 or 28 positions) is specified by the customer at installation time.

SPEED BASE - 600 BPS (#7106). To transmit and receive data over common carrier leased or privately owned facilities at 600 bps ... transmission character rate is 66.7 characters/second. **Note:** Buffer print will be at normal 14.8 cps rate. **Limitations:** Cannot be used when 2740 is connected to a 2712 Remote Multiplexer ... cannot be used with Data Set Attachments (#9115, #9116 or #9120) or with IBM Line Adapters (#4634, #4635, #4641-4644 or #4691-4694). **Prerequisite:** Buffer Receive (#1499).

SPLIT FRICTION FEED PLATEN (#9600). [Plant installation only] One 2-section platen with the split located to provide a 5-1/2" printing line on the left and 7-1/2" printing line on the right can be purchased in lieu of the standard friction feed platen ... with this platen and Document Insertion (#3401, 3402), two separate forms, in addition to printing on a ledger card, can be inserted and individually controlled. For purchase price, see "Split Friction Feed Platen" on M 10000 pages. **Maximum:** One. **Prerequisites:** Document Insertion (#3401 or #3402) and Line Feeding (#9435) (6 lines/inch).

† **TELEGRAPH LINE ATTACHMENT (#7807).** For operation with 75 baud common carrier leased private line telegraph service, or privately owned equivalent, only. With this feature, transmission rate is 8.33 characters/second. [Note: If Buffer Receive (#1499) is also installed, buffer print will be at normal 14.8 cps.] **Limitation:** Cannot be used when 2740 is connected to a 2712 Remote Multiplexer.

** SRL GA24-3435-2 or subsequent revisions.
† For further information, see M 2700 pages.



2740 Communications Terminal (cont'd)

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
• For Either Model				
IBM Line Adapter (Limited Distance, Type 1)				
2-wire	#4634	\$ 3.00	\$ 116	NC 57
4-wire	4635	3.00	116	NC 57
IBM Line Adapter (Leased Line)				
2-wire	4639	10.00	347	\$1.50 96
4-wire	4647	10.00	347	1.50 96
IBM Line Adapter (Shared Line) - 2-wire				
subchannel 1	4641	21.00	694	2.00 96
subchannel 2	4642	21.00	694	2.00 96
subchannel 3	4643	21.00	694	2.00 96
subchannel 4	4644	21.00	694	2.00 96
(Shared Line) - 4-wire				
subchannel 1	4691	21.00	694	2.00 96
subchannel 2	4692	21.00	694	2.00 96
subchannel 3	4693	21.00	694	2.00 96
subchannel 4	4694	21.00	694	2.00 96
IBM Line Adapter (Limited Distance, Type 2B)				
Record Checking	4790	10.00	390	1.00 29
	6114	17.00	645	NC 32
• For Model 1 Only				
Automatic EOB	1313	3.50	139	NC 29
Dial Up	3255	3.00	116	NC 40
Station Control	7479	16.00	585	NC 37
Transmit Control	8028	5.00	195	NC 48
2760 Attachment	8301	10.00	390	NC 35
• For Model 2 Only				
Buffer Expansion				
positions 121-248	1495	10.00	360	1.00 29
positions 249-440	1496	16.00	537	1.00 29
Buffer Receive	1499	5.00	178	NC 21
Document Insertion				
6" wide cards	3401	6.00	217	2.00 PO
7-3/8" wide cards	3402	6.00	217	2.00 PO
Edit	3600	10.00	360	NC 23
Header Control	4510	5.00	178	NC 21
Speed Base - 600 BPS	7106	10.00	360	NC 5
Teletype Line Attach	7807	3.00	112	1.50 49

Roll Paper Holder for 2740 or 2741 An accessory that provides for mounting rolls of paper or continuous forms. Includes a tear bar and forms guide. Available for field installation only. For details and prices, see M 10000 (Accessories) pages.

2741 COMMUNICATIONS TERMINAL

Purpose: A Selectric® typewriter terminal to satisfy special system applications that require one-terminal-per-line operation.

Highlights: Looks like and includes the optimum operator/machine relationship of the standard Selectric typewriter. The only terminal controls located in the keyboard area are the "On/Off" switch and "Attention" key. Mounted on a stand similar to that of the 2740. The typewriter may be used for office typing when not used for data transmission. [NOTE: There are basic design differences in the 2741 which will result in different printing output than the Selectric typewriter. Customers with applications requiring critical printing must be directed to evaluate 2741 output capability in light of their own needs.

Code and systems compatibility provide for transmission to and from a suitably equipped S/360 mdl 22 thru 85, 195, any S/370 Processor except the 3115, or any 4300 Processor. The 2741 can attach to a 3790 system via a 3792 Auxiliary Control Unit. The 2741 can attach to an 8100 Information System via the communications capability of the 8101, 8130 or 8140. See "Prerequisites" below.

Communications Facilities: The 2741 operates in half-duplex mode over the following facilities. For information concerning these facilities, see M 2700 pages.

At 134.5 bps via facilities C1, C2, D1, G1 or G2.

Also see Data Set Attachment under "Specify" for required facility specification code. On appropriate lines, IBM Line Adapters may be used in lieu of data sets ... see "Special Features." IBM Line Adapters and data sets cannot be mixed on the same circuit.

PREREQUISITES:

Communication with a S/360 mdl 25 -- via the Integrated Communications Attachment (#4580) with appropriate features on the 2025. Communication with the S/360 mdl 25 may also be via a 2701, 2702 or 2703.

Communication with a S/370 mdl 115, 125, 135, 135-3, 138 -- via the Integrated Communications Adapter (#4640) on the 3115, 3125, 3135, 3135-3 or 3138. Also a 2701, 2702, 2703, 3704 or 3705 can be used ... see below.

Communication with a S/360 mdl 22 thru 85, 195, or any S/370 Processor -- via a 2701 Data Adapter Unit, or 2702/2703 Transmission Control equipped with appropriate features ... see 2701, 2702, 2703.

Communication with a S/360 mdl 30 thru 195 (except mdl 44, 67 in TSS Mode, 85 or 91), or any S/370 Processor -- via a 3704 or 3705 Communications Controller. NOTE: See the 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

Communication with a 4300 Processor -- via a 2701, 3704 or 3705 to all 4300 Processors and via the Communications Adapter on the 4331. See 2701, 3704, 3705, 4331 and 4341 pages for details and prerequisites.

Communication with a 3792 Auxiliary Control Unit -- via an IBM Leased Line Adapter (#5400) or EIA Interface (#3701) on the 3792.

Communication with an 8100 Information System -- via Communications Adapter with Clock - BSC/SS (#1603) and EIA Interface (#3701) in the 8101, 8130 or 8140.

Customer Responsibilities: See M 2700 pages.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage †† (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V. If a 2741 is to be installed on a raised floor, specify Moisture Proof Plug -- #9902 for 208 V, or #9904 for 230 V. [NOTE: Consideration of voltage must be made independently of CPU voltage and should be specified only after checking available voltage at terminal location.]

[2] Printing Element: One element is supplied ... see "Type Catalog" page TC 21 etc. for available PTTC/BCD, PTTC/EBCD and standard OPD Selectric elements available, feature #s, and prices of additional elements. The element specified determines the keyboard arrangement. [NOTE: The

* or equivalent.

** SRL GA24-3435-2 or subsequent revisions.

† For further information, see M 2700 pages.

†† Only these specify codes and special features are supported by the 3790 system.

2741 Communications Terminal (cont'd)

byte structure of the standard OPD Selectric character set differs from that for PTTC/BCD or PTTC/EBCD character sets.]

[3] Character Spacing: #9104†† for 10 characters/inch, or #9105 for 12 characters/inch. [NOTE: #9105 is not recommended unless a 12-pitch element is specified ... intermixing of character spacing on terminals in any one system should be avoided ... character spacing cannot be changed in the field.]

[4] Line Feeding: #9435†† for 6 lines/inch, or #9436 for 8 lines/inch. If a Pin Feed Platen is desired in lieu of the standard friction feed platen, see "Special Features" below. #9435 or #9436 must be specified even though a Pin Feed Platen is ordered.

[5] Data Set Attachment††: Unless an IBM Line Adapter is specified, one of the following #s must be specified, depending upon the facility to be used.

#9114 -- for facility C1 or C2. *PREREQUISITE:* Dial Up (#3255) ... see "Special Features."

#9115, #9116 or #9120 -- for facility D1M.

See the D1M facility in the M 2700 pages for the applicability of these codes.

See M 2700 pages for information on these communication facilities.

PRICES:	Mdl	MAC MRC	Purchase	MMMC
2741	1	\$ 105	\$ 2,380	\$42.00

Plan Offering: Plan B Purchase Option: 40% Maintenance: B
Warranty: B Per Call: 1

SPECIAL FEATURES

†† **DIAL UP (#3255).** Required when a dial data set is used, i.e., when Data Set Attachment (#9114) is specified.

INTERRUPT, RECEIVE (#4708)††, TRANSMIT (#7900). Either can be used with any of the communication facilities listed above.

Receive Interrupt (#4708) -- used to interrupt transmission from the processor at the operator's convenience.

Transmit Interrupt (#7900) -- allows the processor to interrupt transmission from the 2741.

Limitation: Cannot be used when 2741 is connected to a 2701, or to a S/360 mdl 25 via the Integrated Communications Attachment (#4580). **Prerequisites:** For #4708, either 2741 Break (#8055) or Type I Terminal Interrupt (#8200) on a 2702 or 2703 or a S/370 mdl 125 Integrated Communications Adapter (#4640) or a S/370 mdl 135 Integrated Communications Adapter (#4640) with Write Interrupt (#9745-9752) ... For #7900, Type I Terminal Interrupt (#8200) on a 2702 or 2703 or a S/370 mdl 125 Integrated Communications Adapter (#4640) or a S/370 mdl 135 Integrated Communications Adapter (#4640) with Read Interrupt (#9737-9744) ... if an IBM Line Adapter is used, it must be a 4-wire version. *Both #4708 and #7900 are supported by the 4331 Communications Adapter without additional prerequisites.*

† **IBM LINE ADAPTER (#4634 for 2-wire, #4635 for 4-wire).** A modem for local use up to 4.75 wire-miles over facility G1. See Limited Distance Adapter, Type 1 in SRL GA24-3435** for specifications and restrictions. **Note:** Operation with a 2712 Remote Multiplexer requires #4635.

† **IBM LINE ADAPTER †† (#4639 for 2-wire, #4647 for 4-wire).** A modem for leased or privately owned voice grade use (facility D1). See Leased Line Adapter in SRL GA24-3435** for specifications and restrictions.

† **IBM LINE ADAPTER (#4641-4644 for 2-wire, #4691-4694 for 4-wire).** A modem for shared use of a type 3002 Private Line Service* or privately owned voice grade facility (facility D1). See Shared Line Adapter in SRL GA24-3435** for specifications, use and restrictions. When used, a single voice grade line can provide up to four independent "subchannels" ... the equivalent of up to four independent low-speed lines from a single voice grade line. Each "subchannel" operates on a separate frequency and simultaneous data flow is possible on all four "subchannels."

2-wire #4641 -- for subchannel 1 #4643 -- for subchannel 3
#4642 -- for subchannel 2 #4644 -- for subchannel 4

4-wire #4691 -- for subchannel 1 #4693 -- for subchannel 3
#4692 -- for subchannel 2 #4694 -- for subchannel 4

Maximum: One per 2741. **Prerequisites:** The multiplexer with which the 2741 is to communicate must be equipped with the same "subchannel", i.e., the same feature # ... it is recommended that if no more than two "subchannels" are required on a line facility, that #4641 and #4642, or #4691 and #4692, be used.

† **IBM LINE ADAPTER (#4790).** A modem for 2-wire limited distance use up to 8 wire-miles over facility G2. See Limited Distance Line Adapter, Type 2 in SRL GA24-3435** for specifications and restrictions.

†† **PIN FEED PLATEN (#9509).** [Purchase only] For Plant Installation -- specify #9509 ... maximum, one, in lieu of standard friction feed platen. See "Pin Feed Platens" on M 10000 pages for available options, feature #s to be specified and prices. For Field Installation -- to order add'l platens or to order one for field installation.

†† **PRINT INHIBIT (#5501).** Allows the processing unit to inhibit the 2741 from printing transmitted or received data.

†† **TYPAMATIC KEYS (#8341).** Allows repeat action when key level is depressed to a lower level ... operations included are Hyphen/Underscore/Space and Backspace.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC	
Dial Up	#3255	\$ 3.00	\$ 116	NC	\$ 34
Receive Interrupt	4708	2.50	99	NC	27
IBM Line Adapter					
Limited Distance, Type 1					
2-wire	4634	3.00	116	NC	57
4-wire	4635	3.00	116	NC	57
Leased Line					
2-wire	4639	10.00	347	\$1.50	96
4-wire	4647	10.00	347	1.50	96
Shared Line, 2-wire					
subchannel 1	4641	21.00	694	2.00	96
subchannel 2	4642	21.00	694	2.00	96
subchannel 3	4643	21.00	694	2.00	96
subchannel 4	4644	21.00	694	2.00	96
Shared Line, 4-wire					
subchannel 1	4691	21.00	694	2.00	96
subchannel 2	4692	21.00	694	2.00	96
subchannel 3	4693	21.00	694	2.00	96
subchannel 4	4694	21.00	694	2.00	96
Limited Distance, Type 2	4790	10.00	390	1.00	29
Print Inhibit	5501	10.00	303	NC	87
Transmit Interrupt	7900	8.00	242	NC	132
Typamatic Keys	8341	5.00	195	NC	89

* or equivalent.

** SRL GA24-3435-2 or subsequent revisions.

† For further information, see M 2700 pages.

†† Only these specify codes and special features are supported by the 3790 system.



Purpose: An input/output station and local device data controller for a 2790 Data Communication System.

Model 1 For card, identification badge and 12-key manual entry ... available adapters provide for attachment of up to three 1035 Badge Readers, up to thirty-two 2795/2796/2797 Data Entry Units with a 2715, or System/7, up to twelve 2798 Guidance Display Units (2715 and System/7 only), and an OEM digital device. See "Special Features" and "2791/2793 Limitations" under 2793.

Model 2 For card, identification badge, and 12-key manual entry only.

Model Changes: Model 2 can be changed in the field to model 1, but not vice versa.

Prerequisites: The 2790 system controller can be a 2715 Transmission Control Unit, or a properly equipped System/7.

With 2715 See 2715 for details.

With System/7 See 2790 Control (#8195) under 5012 or 5013.

Highlights: A solid state, industrially packaged unit. It features data entry via pre-punched cards, identification badges, and 12-key manual entry ... display of manually entered data for verification before transmission ... step-by-step display of operator instructions ... display of data in response to an inquiry ... time-of-day display ... designed for attachment to a unique transmission line capable of handling large volumes of short messages from many stations.

Card Reader -- standard or Port-A-Punch® prepunched 80-column cards can be individually inserted and removed manually. An upper left corner cut card, C1, is required. M-3, M-4 and M-5 scores can be used. Numbers, letters and certain special character card codes are read ... see SRL GA27-3015. Blank card columns are not recognized and are automatically skipped.

Badge Reader -- reads identification badges (22-column card size) prepunched in IBM code with a maximum of ten digits. The badges which are punched on a 13 Badge Punch, are individually inserted and removed manually. Badges with or without a pocket clip can be used. They can be purchased from vendors or produced by commercially available equipment. See SRL GA21-9028 for badge specifications. **Note:** A badge gauge is shipped at no charge with each badge punch ... see 13.

Manual Entry -- ten numeric and two special keys provide for entry of variable numeric source data. As each key is depressed, the number or special character is displayed to the operator for verification. Up to six positions are displayed for any one data field. After verification, an enter key is depressed to transmit the data to the system controller. The number of fields that may be entered is specified by the system controller program.

Digital Display -- when not being used for display of manual entry, time-of-day is displayed. Digital display may also be used for display of six digits of data in response to an inquiry.

Operator Guidance -- step-by-step instructions are provided to the operator for each transaction. The thirty-one guidance indicators are designed to permit the user's own terminology. The indicators are activated under program control of the system controller.

Transaction Selection -- nine transaction and one release keys are provided. The transactions may be expanded by subsequent card, badge, or manual entry to provide a greater number of transactions.

Monitor Key -- used where a supervisor's approval is required before a record can be transmitted ... one key is supplied.

Indicators -- advise the operator that: [1] The station is online and ready for use ... [2] The station is in process of transmitting a record ... [3] The record is not valid and the "Repeat Clear" button should be depressed ... [4] A card is in the card reader.

Control Keys -- the "Enter" key is used to transmit the manually keyed data ... the "Clear" key is used to reset the station to normal ready status ... the "Next Guidance" key is used to advance the operator guidance when required for unusual transactions.

Attachment Features -- on the mdl 1, available features permit attachment of up to three 1035 Badge Readers, up to thirty-two 2795/2796/2797 Data Entry Units (any combination), or up to twelve 2798 Guidance Display Units and up to eight 2795/2796/2797s (2715 and System/7 only), and one OEM digital device such as a scale, meter, or counter. See "Special Features."

Customer Responsibilities: See 2790 in "Systems."

Environment: See 2790 in "Systems."

Limitations: See "2791/2793 Limitations" following 2793.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Cable to Junction Box: #9030, if required. If initial machine order includes #3330, #7990, #8030 or #8295, or any combination of these features, #9030 must be specified. Any subsequent to add any of these features must also specify #9030. **Note:** Do not specify #9030 on mechanical replace orders ... See Physical Planning Manual GA27-3017 for requirements. **Note:** If #9030 is specified, provide complete person's name and address for shipment ... cables will be shipped automatically, prior to scheduled delivery.

[4] For initial 2791 machine order having Extended Distance Repeater, Receive or Send (#3874, 3875), specify #9547 and #9548 ... also specify #9548 (oscillator) for each 2791 ordered for the 2790 system.

[5] If a 2792 Remote Communications Controller is used in the 2790 system, specify #9790 for each 2791 mdl 1 or 2 attached to the 2792 mdl 2 on the second "loop."

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
2791	1	\$205	\$7,140	\$56.50
	2	151	5,880	56.50

Plan Offering: Plan B Purchase Option: 40% Maintenance: C
Warranty: B Useful Life Category: 2 Per Call: 1

SPECIAL FEATURES

DIGITAL DEVICE READ-IN (#3330). [Mdl 1 only] For attachment of an OEM digital device such as a scale, meter, or counter via a customer-supplied junction box and cable ... reads up to ten decimal digits. Electrical resistance of OEM device and cable is limited to 10 ohms ... OEM device must comply with the 2791 interface ... see "Specify" [3] above. **Maximum:** One.

EXTERNAL ALARM CONTACTS (#3690). [Mdl 1 only] Provides a pair of dry contacts which can be momentarily (35 milliseconds nominal) closed to allow operation of a customer's attached external alarm device (bell, whistle, light, etc.). Momentary closure of the contacts is activated by receipt of an EBCDIC "Bell" character. The contacts are capable of switching 115 V AC or DC at no more than 0.5 amperes. **Maximum:** One. **Note:** Includes a 4-foot, 2-wire cable for attachment of a customer-provided alarm or junction box. **Limitation:** Not available when System/7 is the system controller. **Prerequisites:** 1053 Attachment (#8050) on the 2791 and Expanded Capability (#3801) on the 2715 controller.

EXTENDED DISTANCE REPEATER, RECEIVE (#3874). Provides for operation with another 2791 or 2793 Area Station or 2715 Transmission Control Unit equipped with Extended Distance Repeater, Send (#3875) located up to 6,000 wire-feet away. See Physical Planning Manual GA27-3017 for cable specifications. **Maximum:** One. **Limitations:** See Limitations for Extended Distance Repeater, Send below. Field installable on units shipped prior to October 2, 1971 which also include B/M 5992893 and all units shipped after October 1, 1971. B/M 5992893 is plant installable only ... when #3874 is added anywhere in the 2790 system an MES, #9548 (oscillator change) must be ordered for each 2791 or 2793 ordered for the system. **Prerequisite:** Extended Distance Repeater, Send (#3875) on the "up-line" 2791, 2793 or 2715.

EXTENDED DISTANCE REPEATER, SEND (#3875). Provides for operation with another 2791 or 2793 Area Station or 2715 Transmission Control Unit equipped with Extended Distance Repeater, Receive (#3874) located up to 6,000 wire-feet away. See Physical Planning Manual GA27-3017 for cable specifications. **Maximum:** One. **Limitations:** [1] The use of two pairs of Extended Distance Repeaters, Receive/Send (#3874, 3875) in tandem is not recommended. If the Area Station having both Receive and Send Repeater should fail, the entire segment would be inactive ... [2] When an System/7 is the 2790 System controller, these repeaters cannot be used between the system controller and the first Area Station or between the last Area Station and the system controller. However, they can be used between all other Area Stations attached to the system within the maximum limit ... [3] Maximum of eight pairs per 2715, or System/7 ... [4] Maximum of two pairs of EDRs may be used on a secondary loop attached to a 2792. Field installable on units shipped prior to October 2, 1971 which also include B/M 5992893 and all units shipped after October 1, 1971. B/M 5992893 is plant installable only ... when #3875 is added anywhere in the 2790 system, an MES, #9548 (oscillator change) must be ordered for each 2791 or 2793 ordered for the system. **Prerequisite:** Extended Distance Repeater, Receive (#3874) on the "down-line" 2791, 2793 or 2715.



2791 Area Station (cont'd)

2798 ATTACHMENT, BASIC (#7990). [Mdl 1 only] For attachment of up to four 2798 Guidance Display Units. **Maximum:** One. **Limitations:** See "2791/2793 Limitations" under 2793. Field installable on units shipped prior to October 2, 1971 which also include B/M 5992893 and all units shipped after October 1, 1971. B/M 5992893 is plant installable only. **Prerequisite:** Expanded Capability (#3801) on the 2715 ... see "Specify" [3] above.

2798 ATTACHMENT, ADDITIONAL (#7991). [Mdl 1 only] Each provides for attachment of up to four 2798 Guidance Display Units. **Maximum:** Two. **Limitations:** See "2791/2793 Limitations" under 2793. **Prerequisite:** 2798 Attachment, Basic (#7990).

1035 ATTACHMENT (#8030). [Mdl 1 only] For attachment of up to three 1035 Badge Readers via customer-supplied junction boxes and cable ... see "Specify" [3] above. **Maximum:** cable length is 1,000 feet. **Maximum:** One.

2795/2796/2797 ATTACHMENT, BASIC (#8295). [Mdl 1 only] For attachment of up to eight 2795/2796/2797 Data Entry Units (any combination) ... see "Specify" [3] above. **Maximum:** One.

2795/2796/2797 ATTACHMENT, ADD'L (#8296). Each provides for attachment of up to eight additional 2795/2796/2797 Data Entry Units (any combination) ... see "Specify" [3] above. **Maximum:** Three. **Limitations:** See "2791/2793 Limitations" under 2793. **Prerequisite:** 2795/2796/2797 Attachment, Basic (#8295).

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIG	
Digital Device Read-in	#3330	\$ 10	\$ 434	\$ 1.00	\$ 72
External Alarm Contacts	3690	10	434	1.00	189
Extended Distance Repeater, Receive	3874	13	520	3.00	96
Send	3875	14	520	3.00	96
2798 Attachment					
Basic	7990	56	2,075	14.00	188
Additional	7991	21	832	4.50	109
1035 Attachment	8030	16	650	2.00	72
2795/2796/2797 Attachment, Basic	8295	28	1,045	2.50	99
Additional	8296	16	650	1.50	51

2792 REMOTE COMMUNICATIONS CONTROLLER

Purpose: For 2790 Data Communication System ... controls exchange of data between the 2790 System Controller and remote 2790 terminals via common carrier leased communication facilities.

Model 1 Attaches to the 2790 System Controller (via the "loop") and directly to the local termination of the common carrier facilities.

Model 2 Attaches directly to the remote termination of the common carrier facilities and up to fifteen 2791/2793 Area Stations (via a secondary "loop").

Both a Model 1 and Model 2, operating point-to-point with one another on the common carrier facilities are required to attach each group of up to fifteen Area Stations.

Model Changes: Available at time of manufacture only.

Highlights: For 2790 Systems in which 2790 terminals are inaccessible to the System Controller via in-house wiring, viz., across a thoroughfare, across the city, or in another city; the 2792s enable exchange of data via common carrier leased communication facilities.

Terminal Devices: Each pair of 2792s establishes a secondary communications loop at the remote location to which can be attached up to fifteen 2791/2793 Area Stations with their associated 2795/2796/2797 Data Entry Units, 2798 Guidance Display Units, Production Monitoring Pulse Count (#5550), and other related features ... see 2715 "Maximum Configurations."

Communication Facilities: Between the 2792 mdl 1 and 2792 mdl 2, the communications facilities must be a leased four-wire duplex channel, Type 3002 with C1 conditioning (or better), or privately owned equivalent. No data sets (modems) are required.

If the communication facilities round-trip delays exceed 80 milliseconds, the 2792 cannot be used. If the communications route between the 2792s, mdl 1 and mdl 2, approximates 1,000 miles or

more, or if the communication facilities round-trip delay is expected to approach 80 milliseconds, the customer should be advised to consult the common carrier to determine the expected communication facilities delay.

The 2792 mdl 1 attaches to the 2715 or System/7 via the 2-wire high speed communications line, in the "loop," similar to the 2791/2793 Area Stations.

2791/2793 Area Stations attach to the 2792 mdl 2 via a 2-wire customer-provided high-speed communication line.

Distances between Area Stations and the 2792 depend upon the characteristics of the line used (e.g., up to 1,000 wire-feet for #22 AWG). The Extended Distance Repeater feature cannot be installed on the 2792s. However, they can be installed in the attached Area Stations. See Physical Planning Manual, GA27-3017.

Prerequisites: [1] A 2715 Transmission Control Unit with Expanded Capability (#3801) or a System/7 with a 2790 Control (#8195 on 5012 or 5013) for the 2790 System Controller ... [2] Specify #9790 on each 2791 Area Station mdl 1 or mdl 2 on the secondary "loop". See "Specify" under 2791.

IBM FE Service: To facilitate servicing of the 2790 terminals on the secondary "loop" by the IBM CE, a minimum of one 1053 Printer is required proximate to each 2792 mdl 2. When System/7 is the 2790 System controller, IBM service requires the resident On-Line Diagnostics program ... see System/7 Programming.

Maximum Configuration: Each 2792 mdl 1 is set in the field to respond to its own address plus the address(es) of 1, 3, 7 or 15 of the Area Stations remotely attached or reserved for future attachment. The maximum number of Area Stations that can be locally attached to the 2790 System controller is reduced by the set number of addresses. The number of 2791/2792 mdl 1/2793s is limited by the number of addresses available to the system controller; i.e., maximum of 100 addresses per 2715.

See 2790 Configurator, SRL GA27-3021. Maximum eight pairs of 2792 mdl 1s and 2s per 2715. Maximum of two pairs of Extended Distance Repeater (EDR) features may be used on a secondary "loop." When System/7 is the controller, the maximum number of 2792 mdl 1s is two per "loop" or four per system.

Limitations: [1] The system configuration and the delays encountered in the common carrier facilities can affect the waiting time at the remote 2790 terminals served by the 2792s. Graphs and formulas to assist the user in determining throughput will be found in SRL GA27-3015. Common carrier communication facilities round-trip delay cannot exceed 80 milliseconds.

Customer Responsibilities: See 2790 in "Systems" and M 2700 pages.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
2792	1	\$308	\$10,710	\$82.50
	2	308	10,710	82.50

Plan Offering: Plan B Purchase Option: 45% Maintenance: D
Warranty: B Per Call: 1



2793 AREA STATION

Purpose: A local device data controller for a 2790 Data Communication System.

Prerequisites: The 2790 system controller can be a 2715 Transmission Control Unit or a properly equipped System/7.

With 2715 See 2715 for details.

With System/7 For details see 2790 Control (#8195) under 5012.

Highlights: A solid state, industrially packaged unit. It controls data transfer between locally attached I/O units and the system controller. It is designed for attachment to a unique transmission line capable of handling large volumes of short messages from many stations.

The basic unit provides for attachment of up to eight 2795/2796/2797 Data Entry Units (any combination) ... available special features provide for attachment of up to twenty-four additional 2795/2796/2797s, and up to sixteen 2798 Guidance Display Units (2715 and System/7 only). See "Special Features."

Customer Responsibilities: See 2790 in "Systems."

Environment: See 2790 in "Systems."

Limitations: See "2791/2793 Limitations" below.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify; [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Cable and Junction Box: #9030, if required. A four foot cable and junction box from the 2793 for initial installation of 2795s/2796s/2797s, or #7990, or #5550 and #5552 ... see Physical Planning Manual, GA27-3017, for requirement. **Note:** If #9030 is specified, provide complete person's name and address for shipment ... cables will be shipped automatically, prior to scheduled delivery.

[4] For initial 2793 machine order having Extended Distance Repeater, Receive or Send (#3874, 3875), specify #9547 and #9548. Also specify #9548 (oscillator) for each 2793 ordered for the 2790 system.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
2793	1	\$135	\$5,255	\$ 19
Plan Offering: Plan B		Purchase Option: 45% Maintenance: B		
Warranty: B		Useful Life Category: 2 Per Call: 1		

SPECIAL FEATURES

EXTERNAL ALARM CONTACTS (#3690). Provides a pair of dry contacts which can be momentarily (35 milliseconds nominal) closed to allow operation of a customer's attached external alarm device (bell, whistle, light, etc.). Momentary closure of the contacts is activated by receipt of an EBCDIC "Bell" character. The contacts are capable of switching 115 V AC or DC at not more than 0.5 amperes. **Maximum:** One. **Note:** Includes a 4-foot, 2-wire cable for attachment of a customer-provided alarm or junction box. **Limitation:** External Alarm not available when System/7 is the system controller. **Prerequisite:** Expanded Capability (#3801) on the 2715.

EXTENDED DISTANCE REPEATER, RECEIVE (#3874). Provides for operation with another 2793 or 2791 Area Station or 2715 Transmission Control Unit equipped with Extended Distance Repeater, Send (#3875) located up to 6,000 wire-feet away. See Physical Planning Manual, GA27-3017, for cable specifications. **Maximum:** One. **Limitations:** See Limitations for Extended Distance Repeater, Send (#3875) below. Field installable on units shipped prior to October 2, 1971 which also include B/M 5992893 and all units shipped after October 1, 1971. The B/M is plant installable only ... when #3874 is added anywhere in the 2790 system, an #9548 (oscillator change) must be ordered for each 2791 or 2793 ordered for the system. **Prerequisite:** Extended Distance Repeater, Send (#3875) on the "up-line" 2791, 2793 or 2715.

EXTENDED DISTANCE REPEATER, SEND (#3875). Provides for operation with another 2793 or 2791 Area Station or 2715 Transmission Control Unit equipped with Extended Distance Repeater, Receive (#3874) located up to 6,000 wire-feet away. See Physical Planning Manual, GA27-3017, for cable specifications. **Maximum:** One. **Limitations:** [1] The use of two pairs of EDRs, Receive or Send in tandem is not recommended. If the Area Station having both features should fail, the entire segment would be inactive. [2] When a System/7 is the 2790 controller, these repeaters cannot be used between the system controller and the

first Area Station, or between the last Area Station and the system controller. However, they can be used between all other Area Stations attached to the system within the maximum limit. [3] Maximum of eight pairs per 2715, or System/7. [4] Maximum of two pairs of EDRs may be used on a secondary loop attached to a 2792. Field installable on units shipped prior to October 2, 1971 which also include B/M 5992893 and all units shipped after October 1, 1971. B/M 5992893 is plant installable only ... when #3875 is added anywhere in the 2790 system, an #9548 (oscillator change) must be ordered for each 2791 or 2793 ordered for the system. **Prerequisite:** Extended Distance Repeater, Receive (#3874) on the "down-line" 2791, 2793 or 2715.

PULSE COUNTERS, BASIC (#5550). Provide necessary control circuits, an FE diagnostic counter for servicing all counters on the Area Station, and the first 7 pulse counters for customer attachment to his production pulsing points. Each counter may be used as an ACCUMULATOR or as a PRE-SET accumulator. Decimal counts to 29,999 may be handled at Area Station level before requiring overflow service from the system controller. Each counter has a unique address. Each counter has Overflow Interrupt and Counter Advance Test indicators. **Maximum:** One. Additional counters are provided via #5551 and #5552 below, to a maximum of 63 counters per Area Station. **Note:** In the event of a power failure, all pulse counters so affected will reset to zero with a resultant loss of count. There are commercially available backup systems via which customers can elect to ensure power continuity, if they so choose. Customers should be advised of the exposure and assurance measures available to meet it. Also see Visual Read-out (#8710) below. **Specify:** #9030 for shipment of a four-foot cable and junction box for attachment of the counters. See "Specify" [3] above. **Limitations:** Cannot be used if 2798 Attachment, Basic (#7990) is used. **Prerequisites:** [1] Customer's production count pulsing contacts must meet the interface requirements for the pulse counter sensing circuits. They are designed to operate with contacts specified as follows: 16 milliseconds minimum closed time; 16 milliseconds open time (equivalent to approximately 30 pulses per second); maximum contact bounce of 4 milliseconds on open or close; maximum contact resistance of 10 ohms ... [2] Wiring (single pair required) from the Area Station pulse counter points to the customer's production pulse counting contacts must be provided, installed and maintained by the customer. The series wire resistance of the wire from the contact to the Area Station must be less than 40 ohms. This requirement can be met by several types of wiring with maximum distance shown such as: Twisted Pair, AWG #22 - 1,000' ... AWG #18 - 3,000' ... AWG #14 - 7,500' ... [3] Expanded Capability (#3801) on the 2715.

PULSE COUNTERS, ADDITIONAL (#5551). Provides a group of 8 counters. See #5550 above for description of counter functions. **Maximum:** 6 groups. **Prerequisites:** #5550 for the first three additional groups (total 31 counters); #5552 for additional groups 4, 5 and 6.

PULSE COUNTER EXPANSION (#5552). Provides a group of 8 counters (nos 32-39) and their necessary circuits and controls. See #5550 for description of counter functions. #5552 also provides controls for adding #5551 groups 4, 5 and 6. **Maximum:** One. **Specify:** #9030 for shipment of a 4-foot cable for attachment of the counters to a customer-supplied junction box. See "Specify" [3] above. **Prerequisites:** #5550 and first three groups of #5551.

2798 ATTACHMENT, BASIC (#7990). For attachment of up to four 2798 Guidance Display Units. **Maximum:** One. **Limitations:** See "2791/2793 Limitations" below. Cannot be used if Pulse Counters (#5550) is used. Field installable on units shipped prior to October 2, 1971 which also include B/M 5992893 and all units shipped after October 1, 1971. B/M 5992893 is plant installable only. **Prerequisite:** Expanded Capability (#3801) on the 2715. See "Specify" [3] above.

2798 ATTACHMENT, ADDITIONAL (#7991). Each provides for attachment of up to four 2798 Guidance Display Units. **Maximum:** Three. **Limitations:** See "2791/2793 Limitations" below. **Prerequisite:** 2798 Attachment, Basic (#7990).

2795/2796/2797 ATTACHMENT, ADDITIONAL (#8296). Each provides for attachment of up to eight add'l 2795/2796/2797 Data Entry Units (any combination) ... cable provided by specify #9030 accommodates #8296 also. **Maximum:** Three.

VISUAL READOUT (#8710). Provides a backup means for manual readout (inside the Area Station cover via coded display lights) of pulse counters if for some reason the Area Station is bypassed, or the system controller is unable to provide service. This feature is dependent upon continuous power being supplied to the counters. Should power be lost, the counters reset to zero. See the "Note" under Pulse Counters, Basic (#5550) above. **Maximum:** One.



2793 Area Station (cont'd)

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
External Alarm Contacts #3690	\$ 10	\$ 434	\$.50	\$189
Extended Distance Repeater,				
Receive	3874	13	520	2.50
Send	3875	14	520	2.50
Pulse Counters, Basic	5550	99	3,900	14.50
Pulse Counters, Add'l	5551	17	694	1.00
Pulse Counter Expansion	5552	41	1,640	4.50
2798 Attachment,				
Basic	7990	56	2,075	12.00
Additional	7991	21	832	4.00
2795/2796/2797 Attach- ment, Additional	8296	16	650	1.00
Visual Readout	8710	33	1,300	1.00

2791/2793 LIMITATIONS

[1] When using a 2715 -- the maximum number of 2791/2793 Area Stations (any combination) is 100 ... the maximum number of 2795/2796/2797 Data Entry Units (any combination) is 1,024 ... the maximum number of 2798 Guidance Display Units is 256 ... the maximum number of Pulse Counters is 1,008.

When using 2792 Remote Communications Controllers with the 2715, the number of Area Stations that can be attached is reduced. Each 2792 mdl 1 is set in the field to respond to its own address plus the address(es) of 1, 3, 7 or 15 of the Area Stations remotely attached or reserved for future attachment. The maximum number of Area Stations that can be locally attached to the 2715 is reduced by the set number of addresses. The number of 2791s/2792 mdl 1s/2793s is limited by the number of addresses available to the 2715: i.e., maximum 100 addresses. Maximum, eight pairs of 2792 mdl 1s and 2s per 2715. Maximum of two pairs of Extended Distance Repeater (EDR) features may be used on a secondary loop. See 2790 Configurator, SRL GA27-3021.

When using a System 7 -- the maximum number of 2791/2792 mdl 1s/2793s combined is 64 ... the maximum number of 2795/2796/2797s combined is 512 ... the maximum number of 2798 Guidance Display Units is 256 per 2790 control feature or 256 per System/7 ... External Alarm is not provided.

[2] One 2791 mdl 1 will accommodate: (a) Up to thirty-two 2795/2796/2797s (any combination), or (b) Up to eight 2795/2796/2797s (any combination) and up to twelve 2798s.

In addition to the above combinations, up to three 1035s, and one OEM digital device can be attached.

[3] One 2793 will accommodate: Up to thirty-two 2795/2796/2797s (any combination) and up to sixteen 2798s, or (b) Up to thirty-two 2795/2796/2797s (any combination) and up to 63 Pulse Counters.

In addition to the above combinations, one 1053 mdl 1 can be attached.

[4] The permissible distance between Area Stations or between the Area Stations and the system controller depends upon the transmission line characteristics. For example: Without Extended Distance Repeater (#3874, 3875), using #22 AWG outside-type telephone cable, these units may be separated up to 1,000 wire-feet apart ... using #19 AWG cable, separation may be up to 1,750 wire-feet. With Extended Distance Repeaters, available on the 2791, 2793 and 2715, units may be separated up to 6,000 wire-feet apart. For cable specifications and other distances, see Physical Planning Manual, GA27-3017. See "Limitations" under Extended Distance Repeat, Send (#3875).

[5] Loop Delay -- System/7 - 2790 performance is affected by delay on the local loop and must be considered when developing a configuration. Maximum loop configurations are determined by a formula for "loop delay" that will assist you in quickly determining the viability of the configuration you are considering. The following calculation should be used for each 5012/5013 module equipped with 2790 Control (#8195). The resultant figure (total usec) must not exceed 316 usec per 5012/5013.

	Quantity		
Area Stations .....2791	_____		
2792 mdl 1	_____		
2793	_____		
Total Area Stations	_____ x	17.6 usec =	_____
Extended Distance Repeater Pairs (send/receive)	_____ x	8.4 usec =	_____
1000' increments of cable	_____ x	2.0 usec =	_____
		Total usec =	_____

For further information on loop delay, see Physical Planning Manual, GA27-3017.

2796 DATA ENTRY UNIT

Purpose: A data entry unit for a 2790 Data Communication System.

Prerequisite: A 2791 Area Station mdl 1 or 2793 Area Station equipped with an appropriate attachment feature ... see 2791 and 2793; or a 5013 equipped with RPQ #D 08249.

Highlights: A compact, industrially packaged reporting unit for use by one or two production workers at their stations. It features a unique reader that accepts either end of a punched card or an identification badge ... four ten-position code selection dials ... 4-position manual entry for quantitative data ... a monitor key ... a telephone jack. It attaches to a 2791 mdl 1 or 2793 or 5013 via a twisted pair cable. Transmission speed is 40 characters/second.

Card-Badge Reader -- reads up to ten numeric digits from either end of a punched card (columns 1-10, or 71-80) or from an identification badge. Data is read interchangeably, from a card or badge, into a given record. Cards and badges are inserted manually. For badge specifications, see SRL GA21-9028. Badges with attached pocket clips cannot be accommodated.

Code Selection -- four 10-position (0-9) rotary dials are used to identify various codes such as production status, services required, labor codes or operation, during execution of a production order.

Manual Entry -- a group of four rocker thumbwheel switches for entry of quantitative data.

Monitor Key -- a three position, key-operated switch permits supervisory control of specific transactions ... one key is supplied.

Telephone Jack -- for supervisor's use in communicating by voice with support groups ... requires a separate voice communication network ... will accommodate a sound powered telephone handset.

Customer Responsibilities -- The DP Marketing Representative must advise the customer that maintenance is provided as defined in "2795/2796/2797 Maintenance" following the 2797. The customer is responsible for: [1] Providing a central maintenance facility ... [2] Installation and removal of the unit from its operational location.

Limitations: See "2795/2796/2797 Limitations" following 2797.

Environment: See 2790 in "Systems."

Maintenance: See "2795/2796/2797 Maintenance" following 2797.

Bibliography: See KWIC Index, G320-1621, or specific system bibliography.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC	
	2796	1	\$28	\$986	\$7.50
	Rental Plan: B		Purchase Option: 45%		Per Call: 1
	Warranty: B		Useful Life Category: 2		

**2797 DATA ENTRY UNIT**

Purpose: A data entry unit for a 2790 Data Communication System.

Prerequisite: A 2791 Area Station mdl 1 or 2793 Area Station equipped with an appropriate attachment feature ... see 2791 and 2793, or a 5013 equipped with RPQ

Highlights: A compact, industrially packaged reporting unit for use by production workers or other employees at their work stations. It features a unique reader that accepts either end of a punched card or an identification badge ... two 10-position code selection dials ... 10 keys for manual entry ... 6-position visual display of manual entry data for verification before transmission ... a monitor key ... an "Enter" key to cause data transmission ... a telephone jack. It attaches to the 2791 mdl 1, 2793 or 5013 via a twisted pair cable. Transmission speed is 40 characters/second.

Card-Badge Reader -- reads up to ten numeric digits from either end of a punched card (columns 1-10, or 71-80) or from a punched identification badge. Data is read interchangeably, from a card or a badge, into a given record. Cards and badges are inserted manually. For badge specifications, see SRL GA21-9028. Badges with attached pocket clips cannot be accommodated.

Code Selection -- two 10-position (0-9) rotary dials are used to input codes for things such as status, names or service required during execution of a production order.

Manual Entry -- 10-key keyboard provides for entry of variable numeric data. As each key is pressed, the number is displayed to the operator for verification. Up to six positions are displayed per data field.

Visual Display -- a 6-position visual display in which digits shift from right to left as keyed. Each position can display any of ten characters, 0-9, and blank.

Monitor Key -- a 3-position, key-operated switch permits supervisory control over the validity of specific records ... one key is supplied.

Control Buttons -- the "Enter" button activates an electric powered unit to transmit to the system controller data read by the card-badge reader, codes selected by the rotary dials, data keyed and visually displayed, and the monitor key digit ... "Reset" button is used to reset the visual display when an error is seen during operator verification.

Telephone Jack -- for supervisor's use in communicating by voice with support groups ... requires a separate voice communication network ... will accommodate a sound powered telephone handset.

Customer Responsibilities: The DP Marketing Representative must advise the customer that maintenance is provided as defined in "2795/2796/2797 Limitations" below. The customer is responsible for: [1] Providing a central maintenance facility ... [2] Installation and removal of the unit from its operational location.

Limitations: See "2795/2796/2797 Limitations" below.

Environment: See 2790 in "Systems."

Maintenance: See "2795/2796/2797 Maintenance" below.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC	
	2797	1	\$52	\$1,990	\$9.00

Plan Offering: Plan B Per Call: 1 Warranty: B
Purchase Option: 45% Useful Life Category: 2

2795/2796/2797 LIMITATIONS

[1] The 2795/2796/2797 Data Entry Units and 2798 Guidance Display Units may be attached up to 1,000 wire-feet from the 2791 mdl 1 or 2793 Area Station or the 5013 Digital Input/Output Module. For cable specifications and other distances, see Physical Planning Manual, GA27-3017.

[2] See "2791/2793 Limitations" under 2793 or to D&PT for RPQ for maximum combinations of Data Entry Units and other devices.

2795/2796/2797 MAINTENANCE

Installation of 2795s, 2796s and 2797s in the immediate work area precludes the acceptability of online repair due to loss of the terminal's use and interruption of the workers' production.

Maintenance of the Data Entry Units will be by hardware replacement as opposed to repair at the operational location. The customer will determine the failing unit and deliver the unit to the central maintenance facility located at his central site. At this facility, the customer engineer will repair and online test the Data Entry Unit. Installation of the units at the operational location is the customer's responsibility. To facilitate CE maintenance and checkout, the customer must provide a dedicated line termination in the central maintenance facility. This line would be wired to address CO of an Area Station. A printer (5028, 1053, 2741, etc.) must be located in the proximity of the maintenance facility.

Although the Data Entry Units of any one type are interchangeable, the customer may wish to replace the failing unit with a spare for availability.

2798 GUIDANCE DISPLAY UNIT

Purpose: For the 2790 Data Communication System -- an alphanumeric keyboard, 16-position variable data display and 48 instruction operator guidance panel for interactive transaction via a 2715 Transmission Control Unit with a S/360 or S/370 Data Base, or with a System/7 as the 2790 system controller.

Prerequisite. A 2791 mdl 1 or 2793 Area Station equipped with an appropriate attachment feature ... see 2791 and 2793.

Highlights: A small, desk/bench mounted, self-contained, buffered, data entry and output unit for multi-step interactive transactions via a 2715 Transmission Control Unit or with a System/7 as the 2790 system controller ... packaged for industrial environment ... featuring a typewriter-style 56-character alphanumeric keyboard ... 8 control keys ... a 16-position visual display ... a unique 48 instruction operator guidance panel which can be customized by the user to suit his specific applications ... 6 operational indicators ... a monitor key ... and an ON/OFF switch. Each unit is attached to a 2791 mdl 1 or 2793 Area Station via a 4-wire user-provided cable (up to 1,000 wire-feet).

Keyboard -- the 56 data keys include the 26 alphabetic, 10 numeric, 4 printer functions represented by symbols for tab, new line, line feed and space, 8 special characters and 8 functional keys (assignable by the user) ... the 8 control keys for functions such as Enter, Clear, Cancel, Backspace, Transaction-Lock and Unlock, Advance and Display-Inhibit.

Display -- for visual verification, prior to transmission, of any 16-character combination of the 56 characters entered from the keyboard ... response data or messages ... guidance expansion messages ... time-of-day, when not used for data, from the system controller.

Guidance Panel -- up to 16 customer defined instructions can be actuated at a time on the guidance panel by the system controller to direct the operator step-by-step through transactions or for status information ... instructions are written on two removable overlays provided by the customer to suit his specific applications ... overlays are similar to those used on the 2791 Area Station ... three manual settings on each of the two panels provide for a total of 48 instructions or lines of information.

Operational Indicators -- advise the customer that: [1] The unit is "online" and ready for use ... [2] A transaction is "in-process" ... [3] The record is not valid, the "Clear" button should be depressed and data re-entered ... [4] The "transaction-selection" code must be entered ... [5] The "transaction-lock" mode is in effect ... [6] The "first step" of a multi-step transaction should be initiated.

Monitor Key -- a 2-position common key operated switch permits supervisory control of specific transactions.

ON/OFF Switch -- a power on-off switch.

Customer Responsibilities -- see 2790 in "Systems."

Environment -- See 2790 in "Systems."

Limitations: [1] Using #22 AWG inside-type telephone cable, 2798s may be attached up to 1,000 wire-feet from the 2791 mdl 1 or 2793. See Physical Planning Manual, GA27-3017 for cable specifications and other distances ... [2] See "2791/2793 Limitations" under 2793 for maximum combinations of 2798s and other devices ... [3] 2798 attachment is not available when an 1800 System is the system controller.



DP Machines

M 2798
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2798 Guidance Display Unit (cont'd)

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): **#9880** for locking plug, or **#9881** for non-lock plug.

PRICES	Mdl	MAC/ MRC	Purchase	MMMC
2798	1	\$96	\$3,740	\$18.50

Plan Offering: Plan B Maintenance: B Per Call: 1
Warranty: B Purchase Option: 45%
Useful Life Category: 2

2803 / 2804 TAPE CONTROL

Purpose: Control unit for 2401 (and/or 2402) Magnetic Tape Units in a S/360, S/370 or 4300 Processor. With an appropriate special feature, a 2803 mdl 2 can also control 2420 Magnetic Tape Units ... see "Special Features."

Models

2803 Tape Control -- a single channel, read or write control unit to which up to eight tape drives can be attached.

Model 1 -- controls up to eight 800 bpi drives (2401/2402 mdls 1, 2 and 3).

Model 2 -- the basic unit controls up to eight 1600 bpi drives (2401/2402 mdls 4, 5, 6). With an appropriate special feature, it can also handle 800 bpi drives (2401/2402 mdls 1, 2 and 3) ... see "Special Features." Another special feature permits attachment of 2420 mdl 5s and 7s (1600 bpi). See #7900 under "Special Features."

Model 3 -- controls up to eight 2401 mdl 8s only. The data conversion function is standard.

2804 Tape Control -- a two channel, simultaneous read-while-write control unit to which up to eight tape drives can be attached.

Model 1 -- controls up to eight 800 bpi drives (2401/2402 mdls 1, 2 and 3).

Model 2 -- the basic unit controls up to eight 1600 bpi drives (2401/2402 mdls 4, 5 and 6). With an appropriate special feature, it can also handle 800 bpi drives (2401/2402 mdls 1, 2 and 3) ... see "Special Features."

Model 3 -- controls up to eight 2401 mdl 8s only.

Model Changes: Cannot be made in the field.

Highlights:

2803 -- can be used with a 2816 Switching Unit(s) for tape drive switching ... see 2816 and 16 Drive Addressing (#7185) under "Special Features" below.

2804 -- considering "Write," "Write Tape Mark" and "Erase" as write operations, the 2804 can perform a read and a write operation simultaneously.

2803/2804 -- each unit contains error detection and single track error correction facilities.

Tape compatibility special features permit reading/writing of tapes of varying formats and bit densities by attached drives equipped with appropriate read/write heads .. see compatibility features under "Special Features."

Prerequisites: For 2803 -- a control unit position on a system channel ... For 2804 -- a control unit position on each of two channels of the same system. For channel limitations, see "S/360, S/370, 4300 Processors" below.

Simultaneous Read-while-Write (#7160, 7161) is required on each 2401/2402 attached to a 2804 ... Mode Compatibility (#5121, 5122) is required on each 2401/2402 mdl 1, 2 or 3 attached to a 2803/2804 mdl 2 .. see "Special Features" under appropriate unit.

S/360, S/370, 4300 Processors:

2803 -- can be attached to S/360 mdls 22 thru 91 and 195, any S/370 Processor (except 3115 or 3125), or any 4300 Processor.

2804 -- can be attached to S/360 mdls 22, 30 thru 91 and 195, all S/370 Processors (except 3115 and 3125), and the 4341 Processor. **Limitations:** For individual tape drive limitations on specific S/360 and S/370 models or 4300 Processors, see 2401 (or 2402), or 2420.

[1] In a S/360 mdl 25, only 2803 mdl 1s, 2s or 3s can be attached, and they must be attached to the selector channel. In addition, only 2401s which do not exceed a 60KB data rate can be attached ... see 2401.

[2] In a S/360 mdl 22, 30 thru 50, or S/370 mdl 135, 135-3, 138, 145, 145-3 or 148, if attached to a multiplexer channel, a 2803 or 2804 must be attached via a shared-path channel

Mdl 135, 135-3, 138 -- not supported on byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or selector channel.

[3] A 2803 mdl 2 can be attached to a S/360 mdl 67 only if the the mdl 67 is operated in 65 mode.

[4] In a S/360 mdl 67-2, both channels required by a 2804 must be attached to the same 2846.

[5] See 4331 byte multiplexer channel for restrictions.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. For 2803 only #9046 for white.

[3] 2420 Prospect (2803 mdl 2 only): #9701 ... must be specified on AAS if the 2803 mdl 2 is to be used for future attachment of 2420 mdl 5s/7s. See 2420 Model 5/7 Attachment (#7900) under "Special Features."

[4] Control Unit Isolation: Field installation may be required on certain units ... see #4701-4705 under "Special Features."

PRICES:	Mdl	-FTP/-				MMM
		MAC/ MRC	MLC 1 Yr*	MLC 2 Yr	Purchase	
2803	1	\$729	\$671	\$612	\$29,200	\$30.50
	2	898	826	754	36,040	40.00
	3	503	463	423	17,190	48.50
2804	1	1,040	957	874	41,880	56.50
	2	1,210	1,113	1,016	48,710	65.50
	3	701	645	589	23,810	74.00

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: C Per Call: 3 Warranty: B
Purchase Option: 55% Metering: Assignable Unit
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 10%
Upper Limit Percent: 0%

SPECIAL FEATURES

DATA CONVERSION (#3228 on 2803, #3236 on 2804). A program controlled feature to process data with maximum packing efficiency. On a write operation, three 8-bit bytes are written as four 6-bit tape characters ... on a read operation, four 6-bit characters are converted to three 8-bit bytes. Not required on the 2803 mdl 3 or 2804 mdl 3. **Limitation:** Cannot be used when reading 7-track tape backwards. **Prerequisite:** Seven Track Compatibility (#7125, 7126, 7127, 7128) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135, 7136).

ISOLATION, CONTROL UNIT (#4701-4705). [for field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn DC power on or off on the tape control without generating spurious signals. Thus, a CPU, if it can be logically disconnected from the system before power is turned off, can continue operating.

- #4701 -- for basic 2803 mdl 1.
- #4702 -- for a 2803 mdl 1 with Two Channel Switch (#8100).
- #4703 -- for a 2803 mdl 2.
- #4704 -- for 2804 mdl 1.
- #4705 -- for 2804 mdl 2.

Prerequisite: in all cases there are compatible EC level requirements and technical limitations,

#4702 requires #8100 on the 2803 mdl 1.

NINE TRACK (800 BPI NRZI) COMPATIBILITY (#5320 on 2803 mdl 2, #5321 on 2804 mdl 2). Required if any tape drive attached to the 2803/2804 mdl 2 has a 9-track Read/Write Head (#9558), or if any attached tape drive mdl 4, 5 or 6 has Dual Density 800-1600 BPI (#3471, 3472). Allows the reading and writing of 800 bpi, 9-track NRZI tape in addition to 1600 bpi. **Limitation:** Cannot be installed with Seven Track Compatibility (#7127, 7128) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135, 7136).

REMOTE SWITCH ATTACHMENT (#6148). [2803 mdl 1 only] To attach the Two Channel Switch (#8100) to a 2167 Configuration Unit in a S/360 mdl 67-2, to a S/360 mdl 158 MP or 158 MP.

SEVEN TRACK COMPATIBILITY (#7125-7128). [2803/2804 mdls 1, 2 only] Permits any attached tape drive equipped with a 7-track Read/Write Head (#9557) to read or write in 7-track format compatible with tape generated by 727/729/7330/7335/7701/7702/7765 tape units. **Specify:** The number of drives equipped with 7-track Read/Write Heads that are to be associated with this feature. **Limitation:** Cannot be installed with Nine Track (800 BPI NRZI) Compatibility (#5320, 5321) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135, 7136).

- #7125 -- for 2803 mdl 1
- #7126 -- for 2804 mdl 1
- #7127 -- for 2803 mdl 2
- #7128 -- for 2804 mdl 2

SEVEN AND NINE TRACK (800 BPI NRZI) COMPATIBILITY (#7135, 7136). [2803/2804 mdl 2 only] Provides the functions of

* FTP is 12-23 months.



2803/2804 Tape Control (cont'd)

both Nine Track (800 NRZI) Compatibility (#5320, 5321) and Seven Track Compatibility (#7127, 7128). Permits reading and writing by attached mdl 1, 2 or 3 tape drives equipped with either 7-track or 9-track Read/Write Heads (#9557, 9558) or attached mdl 4, 5 or 6 drives with Dual Density 800-1600 BPI (#3471, 3472). **Specify:** The number of drives equipped with 7-track Read/Write Heads that are to be associated with this feature.

#7135 -- for 2803 mdl 2 ... **#7136** -- for 2804 mdl 2.
Limitation: Cannot be installed with Nine Track (800 BPI NRZI) Compatibility (#5320, 5321) or Seven Track Compatibility (#7127, 7128).

16 DRIVE ADDRESSING (#7185). [2803 mdl 1 or 2 only] Required when the pool of drives attached through 2816 Switching Unit mdl 1s exceeds eight. Permits the 2803 to address up to sixteen drives. **Prerequisite:** Two 2816 mdl 1s with appropriate features ... see 2816.

2420 MODEL 5/7 ATTACHMENT (#7900). [2803 mdl 2 only] To attach up to eight 2420 mdl 5s and 7s in any combination. With this feature, the tape drive combination can include 2401/2402 mdl 4s, 5s and 6s. If #5320, #7127 or #7135 is also installed on the 2803 mdl 2, the eight tape drive combination can also include 2401/2402 mdl 1s, 2s and 3s. **Prerequisite:** The 2803 must be serial no. above 14000 and below 30000 ... if this feature is not specified and 2420s will be attached to the 2803 at a future date, see item [3] under "Specify."

Notes:

[1] A 2803 md 2 (serial no. 14001 through 15999) with #7900 requires a 2420 Model 5 Modification (#9690) if 2420 mdl 5s are to be attached. Submit specifying #9690).

TWO CHANNEL SWITCH (#8100). [2803 mdl 1 only] [Plant installation only] To attach the 2803 mdl 1 to a second channel. Switching is under program control. Includes partitioning. For use in a S/360 mdl 67, a S/360 mdl 65 MP, or a S/370 mdl 158 MP or 168 MP only. **Limitation:** Only 2803 mdl 1s above serial no. 30000 can be modified at the plant with this feature. New production on 2803 mdl 1s above serial no. 30000 ceased in April, 1968. **Prerequisites:** If #8100 is routed through the Configuration Control Panel (#1505) of a S/360 mdl 65 MP, Remote Switch Attachment (#6148) is required. #6148 is also required in a S/360 mdl 67-2, or a S/370 mdl 158 MP or 168 MP.

---FTP---
MAC/MLC MLC
MRC 1 Yr* 2 YrPurchase MMMC FIC

Special Feature Prices:

On 2803/2804 (any model)

	#	\$	\$	\$	\$	\$	\$
Data Conversion							
on 2803	#3228	\$49	\$45	\$41	\$1,935	\$1.50	\$88
on 2804	3236	77	71	65	3,070	2.00	179
Isolation, Control Unit							
on basic 2803 mdl 1	4701	NC	NC	NC	NC	NC	NC
on 2803 mdl 1 w #8100	4702	NC	NC	NC	NC	NC	NC
on 2803 mdl 2	4703	NC	NC	NC	NC	NC	NC
on 2804 mdl 1	4704	NC	NC	NC	NC	NC	NC
on 2804 mdl 2	4705	NC	NC	NC	NC	NC	NC
7 Track Compatibility							
on 2803 mdl 1	7125	54	50	45	2,145	2.00	131
on 2804 mdl 1	7126	83	76	70	3,270	3.00	179
on 2803 mdl 2	7127	195	179	164	7,545	29.50	869
on 2804 mdl 2	7128	223	205	187	8,625	34.00	1,070

On 2803/2804 model 2

9 Track Compatibility							
on 2803 mdl 2	5320	256	236	215	9,925	45.00	946
on 2804 mdl 2	5321	311	286	261	12,000	35.00	1,140
7 & 9 Track Compatibility							
on 2803 mdl 2	7135	420	386	353	16,090	77.00	1,245
on 2804 mdl 2	7136	503	463	423	19,400	70.00	1,530

On 2803 mdl 1 or 2

16 Drive Addressing	7185	26	24	22	1,100	1.50	66
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On 2803 mdl 1

Remote Switch Attachment	6148	NC	NC	NC	NC	NC	NC
Two Channel Switch	8100	110	101	92	3,765	5.50	PO

On 2803 mdl 2 ... serial no. above 14000 and below 30000 only

2420 Mdl 5/7 Attachment	7900	381	351	320	15,210	14.50	251
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* FTP is 12-23 months.



2816 SWITCHING UNIT

Purpose: To switch drives between tape control units and a common group of magnetic tape drives in a S/360 mdl 22, 30 thru 85 or 195, any S/370 Processor (except 3115 or 3125), or any 4300 Processor.

Highlights: For switching between 2803 Tape Controls and 2403 Magnetic Tape Unit and Controls and drives of all models of 2401s, 2402s, 2403s, except for switching between 2803 mdl 3 and 2401 mdl 8, which cannot be attached via the 2826. Also provides switching capability for 2420 Magnetic Tape Unit mdl 5s and 7s and all models of 2401s and 2402s used with 2803 mdl 2s. **Note:** Phase Encoded tape control units (2803 mdl 2, 2403 mdl 4s,5s,6s) cannot be connected to NRZI control units (2803 mdl 1, 2403 mdl 1, 2, 3) via the same 2816 ... see SRL GA22-6866 for complete details.

Switching is on a per record basis under program control. The 2816 provides the ability to manually isolate any tape drive(s) from the control of one or more tape controls. It reduces the number of tape drives necessary for any given application by providing each tape unit with an increased number of access paths.

The basic 2816 provides for switching between two tape controls and up to four tape drives. This switching ability can be expanded in increments of one tape control and/or four tape drives to a maximum of four tape controls and eight tape drives. Two 2816s can be coupled to provide switching between a maximum of four tape controls and sixteen drives. See "Special Features" for feature requirements. **Note:** The use of two 2816s to switch more than eight tape drives requires 16 Drive Addressing (#7185) on the tape control units ... see 2803 or 2403.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Cabling: #9080 for below floor, or #9081 for on floor.

		---FTP---				
		MAC/	MLC	MLC		
PRICES:	Mdl	MRC	1 Yr*	2 Yr	Purchase	MMMC
	2816	1	\$617	\$568	\$518 \$23,810	\$4.50

Plan Offering: Plan B. Maintenance: C Per Call: 3
Warranty: B Purchase Option: 55%
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES

ADD'L DRIVES FOR BASIC SWITCH (#1050). For switching between four additional tape drives and the first and second tape controls attached to the basic switch.

ADD'L DRIVES FOR THIRD CONTROL (#1051). Permits the third tape control to access the four additional tape drives associated with #1050. **Prerequisites:** Add'l Drives for Basic Switch (#1050) and Add'l Drive Adapter (#1055).

ADD'L DRIVES FOR FOURTH CONTROL (#1052). Permits the fourth tape control to access the four additional tape drives associated with #1050. **Prerequisites:** Add'l Drives for Basic Switch (#1050), Add'l Drive Adapter (#1055), and Fourth Control Attachment (#4455).

ADD'L DRIVE ADAPTER (#1055). Provides for the installation of, and is prerequisite for, feature #1051 and/or #1052. **Prerequisites:** Add'l Drives for Basic Switch (#1050) and Control for Base Drives, Third (#2285).

CONTROL FOR BASE DRIVES, THIRD (#2285). To attach a third tape control to the basic switch with access to the four tape drives included with the basic switch.

CONTROL FOR BASE DRIVES, FOURTH (#2286). To attach a fourth tape control to the basic switch with access to the four tape drives included with the basic switch.

FOURTH CONTROL ATTACHMENT (#4455). To attach a fourth tape control ... prerequisite to feature #2286 and/o #1052. **Prerequisite:** Control for Base Drives, Third (#2285).

SECOND 2816 ATTACHMENT- FIRST CONTROL (#6392). Interconnects two 2816s. Connects the tape control occupying the first position on a 2816 or to a feature installed in a second 2816. If this feature is installed, it must be connected to the second 2816 at all times.

SECOND 2816 ATTACHMENT - SECOND CONTROL (#6393). Interconnects two 2816s. Connects the tape control occupying the second position on a 2816 to a second 2816 or to a feature

installed in a second 2816. If this feature is installed, it must be connected to the second 2816 at all times. **Prerequisite:** Second 2816 Attachment - First Control (#6392).

TAPE DRIVE INTERMIX (#7803). Required on each 2816 when 2400 mdl 1s, 2s or 3s are to coexist with 2400 mdl 4s, 5s or 6s, or with 2420 mdl 5s or 7s.

		---FTP---				
		MAC/	MLC	MLC		
		MRC	1 Yr*	2 Yr	Purchase	MMMC
Special Feature Prices:						
Additional Drives						
Basic Switch	#1050	\$166	\$153	\$139	\$6,455	\$3.00 \$221
3rd Control	1051	67	62	56	2,595	1.00 32
4th Control	1052	67	62	56	2,595	1.00 32
Add'l Drive Adapter	1055	33	30	28	842	NC 21
Control for Base Drives						
3rd	2285	94	86	79	3,675	1.50 88
4th	2286	26	24	22	1,100	1.50 32
4th Control Attachment	4455	67	62	56	2,595	NC 54
2nd 2816 Attachment						
1st Control	6392	10	9	8	448	NC 88
2nd Control	6393	10	9	8	448	NC 88
Tape Drive Intermix	7803	10	9	8	460	NC 29

* FTP is 12-23 months.



2821 CONTROL UNIT

Purpose: Control and buffer storage unit for a card read punch and/or one or more printers in a S/360 mdl 22 thru 85 and 195, any S/370 Processor, or any 4300 Processor.

- Model 1** Controls a 2540 Card Read Punch and one printer.
- Model 2** Controls one printer.
- Model 3** Controls two printers ... with Third Printer Control (#7945) controls three printers.
- Model 4** Controls a 2540 Card Read Punch and one 1404 Printer.
- Model 5** Controls a 2540 Card Read Punch and two printers ... with Third Printer Control (#7945) controls three printers.
- Model 6** Controls a 2540 Card Read Punch.

Model Changes: Model 1 can be field converted to model 6

Highlights:

Models 1 and 2 -- the printer may be a 1403 mdl 2, 3, 7 or N1 ... for attachment for a 1403 mdl 2 or 7, see "Specify" ... for attachment of a 1403 mdl 3 or N1, see 1100 LPM Printer Adapter (#3615) under "Special Features."

Models 3 and 5 -- two printers, or with Third Printer Control (#7945), three printers can be attached. They may be in any combination of 1403 mdls 2, 3, 7 and N1 ... for attachment of 1403 mdl 2s and 7s, see "Specify" ... for attachment of 1403 mdl 3s or N1s, see 1100 LPM Printer Adapter (#3615) under "Special Features." Program priority for multiple printers on these models is:

1st Priority	Printer Control No. 1
2nd Priority	Printer Control No. 2
3rd Priority	Printer Control No. 3

Model 4 -- the printer must be a 1404.

Limitations: 1403s -- for models available for each S/360, S/370 model, or any 4300 Processor, see "Models" under 1403 ... **1404s** -- cannot be attached to a S/360 mdl 22, 44, 65, 67, 75, 85 or 195, S/370 or 4300 Processors.

Prerequisites: A control unit position on a system channel.

S/360 mdl 25 -- special feature on 2025: Multiplexer Channel, or Selector Channels ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, Add'l High Speed Multiplexer Subchannels ... see 2044. **Note:** 2821 mdl 4 cannot be attached.

S/360 mdl 65, 75 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870. **Note:** 2821 mdl 4 cannot be attached.

S/360 mdl 67 -- basic multiplexer channel of 2870 ... see 2870. **Note:** 2821 mdl 4 cannot be attached.

S/360 mdl 85, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, shared or unshared subchannels of 2880 (non-shared is recommended) ... see 2860, 2870, 2880. **Note:** 2821 mdl 4 cannot be attached.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125. **Note:** 2821 mdl 4 cannot be attached.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channel, Block Multiplexer Channel ... see 3135. **Note:** 2821 mdl 4 cannot be attached.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3. **Note:** 2821 mdl 4 cannot be attached.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138. **Note:** 2821 mdl 4 cannot be attached.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145. **Note:** 2821 mdl 4 cannot be attached.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3. **Note:** 2821 mdl 4 cannot be attached.

S/360 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138. **Note:** 2821 mdl 4

cannot be attached.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158 and 3158-3. **Note:** 2821 mdl 4 cannot be attached.

S/370 mdl 165, 168, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) of 2870, shared or unshared subchannels of 2880 (non-shared are recommended) ... see 2860, 2870, 2880. **Note:** 2821 mdl 4 cannot be attached.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032. **Note:** 2821 mdl 4 cannot be attached.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033. **Note:** 2821 mdl 4 cannot be attached.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331. **NOTE:** 2821 mdl 4 cannot be attached.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341. **NOTE:** 2821 mdl 4 cannot be attached.

Bibliography: S/360 -- GC20-0360 S/370 -- GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): **#9903** for 208 V, or **#9905** for 230 V.

[2] Color: **#9041** for red, **#9042** for yellow, **#9043** for blue, **#9045** for gray, or **#9046** for white.

[3] 1403 Model 2 Attachment -- for each 1403 mdl 2 to be attached to a 2821 mdl 1, 2, 3 or 5, specify one of the following: **#9241** -- to attach a 1403 mdl 2 to a 2821 mdl 1 or 2, or to Printer Control No. 1 on a 2821 mdl 3 or 5 ... **#9242** -- to attach a 1403 mdl 2 to Printer Control No. 2 on a 2821 mdl 3 or 5 ... **#9243** -- to attach a 1403 mdl 2 to Printer Control No. 3 on a 2821 mdl 3 or 5. Third Printer Control (#7945) also required ... see "Special Features."

[4] 1403 Model 7 Attachment -- for each 1403 mdl 7 to be attached to a 2821 mdl 1, 2, 3 or 5, specify one of the following: **#9246** -- to attach a 1403 mdl 7 to a 2821 mdl 1 or 2, or to Printer Control No. 1 on a 2821 mdl 3 or 5 ... **#9247** -- to attach a 1403 mdl 7 to Printer Control No. 2 on a 2821 mdl 3 or 5 ... **#9248** -- to attach a 1403 mdl 7 to Printer Control No. 3 on a 2821 mdl 3 or 5. Third Printer Control (#7945) also required ... see "Special Features."

[5] 1403 Model 3 or N1 Attachment: Each 1403 mdl 3 or N1 requires the appropriate 1,100 LPM Printer Adapter (#3615) ... see "Special Features."

[6] Compatibility Attachment: If the 2540 is to be used with 1401/1403 Attachment (#4463) with 1401/1440/1460 Basic Compatibility (#4456) or 1620 Compatibility (#7190) on a 2030, or with 1401/1460 Compatibility (#4457) on a 2040, then 2540 Compatibility Attachment (#8065) is required ... see "Special Features."

[7] Compatibility Attachment: If the 2540 is to be used with 1401/1440/1460 Compatibility (#4457) on a 3115, 3125, 3135, 3135-3, 3138, 3145, 3145-3 or 3148, or with 1401/1440/1460, 1410/7010 Compatibility (#4458) on a 3145, 3145-3 or 3148, or 1401/1440/1460, 1410/7010 Compatibility (#3950) on a 3155, 3158 or 3158-3, then 2540 Compatibility Attachment (#8065) is required ... see "Special Features."

[8] Isolation Feature: May be required on units shipped prior to December 29, 1967 ... see "Special Features."

[9] Compatibility Attachment: If the 2540 is to be used with 1401/1440/1460 Compatibility (#3950) on a 4331 Processor, then 2540 Compatibility Attachment (#8065) is required ... see "Special Features."

PRICES:	Mdl	--FTP/--			Purchase	MMMC
		MAC/MRC	MLC 1 Yr*	MLC 2 Yr		
2821	1	\$1,085	\$998	\$911	\$41,770	\$75.50
	2	674	620	566	25,900	57.50
	3	1,345	1,237	1,130	51,690	118.00
	4	1,175	1,081	987	45,300	80.00
	5	1,750	1,610	1,470	67,670	133.00
	6	493	454	414	14,210	166.00

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: B Per Call: 3 Warranty: B
Metering: Assignable Unit Purchase Option: 55%
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%
Model/Feature Additional Charge in lieu of AU Charge: 10%

2821 Control Unit (cont'd)
SPECIAL FEATURES

COLUMN BINARY (#1990). [Models 1, 4, 5, 6 only] Cards with multiple significant digit punching in a single card column can be processed by the 2540 ... the Extended BCD Interchange Code used by S/360 assemblers and compilers does not require this feature on the 2821. **Prerequisite:** Column Binary (#1990) on the 2030 Processing Unit if column binary cards are to be processed on the 2540 when the S/360 mdl 30 is operating in 1401/1440/1460 compatibility mode.

1,100 LPM PRINTER ADAPTER (#3615). [Models 1, 2, 3, 5 only] To attach a 1403 Printer mdl 3 or N1. One #3615 is required for each 1,100 lpm printer attached. **Specify:** With each #3615, one of the following, depending upon the control position to which the printer is to be attached: **#9262** -- to a 2821 mdl 1 or 2, or to Printer Control No. 1 on a 2821 mdl 3 or 5 ... **#9263** -- to Printer Control No. 2 on a 2821 mdl 3 or 5 ... **#9264** -- to Printer Control No. 3 on a 2821 mdl 3 or 5. Third Printer Control (#7945) is also required.

ISOLATION, CONTROL UNIT (#4701-4705). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2821 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating.

- #4701 -- for a 2821 mdl 4.
- #4702 -- for a 2821 mdl 1, 2, 3 or 5 with neither Two Channel Switch (#8100) nor Universal Character Set Adapter (#8637, 8638, 8639).
- #4703 -- for a 2821 mdl 1, 2, 3 or 5 with #8637, 8638 or 8639 but not #8100.
- #4704 -- for a 2821 mdl 1, 2, 3 or 5 with #8100 but not with #8637, 8638 or 8639.
- #4705 -- for a 2821 mdl 1, 2, 3 or 5 with both #8100 and #8637, 8638 or 8639.

Prerequisites: in all cases there are compatible EC level requirements,

#8637, 8638 or 8639 ... #4704 requires #8100 ... #4705 requires both #8100 and #8637, 8638 or 8639.

PUNCH FEED READ CONTROL (#5895). [Models 1, 4, 5, 6 only] Required for Punch Feed Read (#5890) on a 2540.

READ-COMPARE ADAPTER (#5991). [model 4 only] Required for Read-Compare (#5990) on a 1404.

REMOTE SWITCH ATTACHMENT (#6148). [Models 1, 2, 3, 5 only] To attach the Two Channel Switch (#8100) to a 2167 Configuration Unit in a S/360 mdl 67-2, to a S/360 mdl 65 MP which has the Configuration Control Panel (#1505) installed, or to a S/370 mdl 158 MP or 168 MP.

SELECTIVE TAPE LISTING CONTROL (#6412). Required for Selective Tape Listing Feature (#6410, 6411) on a 1403 mdl 2, 3 or N1. One #6412 is required for each printer equipped with #6410 or 6411. **Specify:** With each #6412, one of the following, depending upon the control position to which the printer with #6410 or 6411 is to be attached:

- #9761 -- to a 2821 mdl 1 or 2, or to Printer Control No. 1 on a 2821 mdl 3 or 5.
- #9762 -- to Printer Control No. 2 on a 2821 mdl 3 or 5.
- #9763 -- to Printer Control No. 3 on a 2821 mdl 3 or 5 ... #7945 is also required.

Note: Orders for this feature for a 1403 mdl N1 equipped with Selective Tape Listing Feature (#6410) are no longer accepted ... for 1403 mdl N1s equipped with the new Selective Tape Listing Feature (#6420), see #6425 below.

SELECTIVE TAPE LISTING CONTROL (#6425). [Models 1, 2, 3, 5 only] [For use in S/360 mdls 22, 25, 30, 40, 50 only] Required for the new Selective Tape Listing Feature (#6420) on a 1403 mdl N1. One #6425 is required for each printer equipped with #6420. **Specify:** With each #6425, one of the following, depending upon the control position to which the printer with #6420 is to be attached:

- #9765 -- to a 2821 mdl 1 or 2, or to Printer Control No. 1 on a 2821 mdl 3 or 5.
- #9766 -- to Printer Control No. 2 on a 2821 mdl 3 or 5.
- #9767 -- to Printer Control No. 3 on a 2821 mdl 3 or 5 ... #7945 is also required.

THIRD PRINTER CONTROL (#7945). [Models 3, 5 only] [Plant installation only] To attach a third printer. Any combination of three 1403s, mdls 2, 3, 7, N1 can be used. An 1,100 LPM Printer Adapter (#3615) is required for each 1403 mdl 3 or N1 attached.

2540 COMPATIBILITY ATTACHMENT (#8065). [Models 1, 4, 5, 6 only] Required if the 1402/1403 Attachment (#4463) with 1401/1440/1460 Basic Compatibility (#4456) or 1620 Compatibility (#7190) is used on a 2030 Processing Unit, or 1401/1460 Compatibility (#4457) is used on a 2040 Processing Unit ... not

required for normal S/360 operation of the 2540. Required if 1401/1440/1460 Compatibility (#4457) is used on a 3115, 3125, 3135, 3135-3, 3145, 3145-3 or 3148 Processing Unit, or if 1401/1440/1460, 1410/7010 Compatibility (#4458) is used on a 3145, 3145-3 or 3148 Processing Unit, or if 1401/1440/1460, 1410/7010 Compatibility (#3950) is used on a 3155, 3158 or 3158-3 Processing Unit ... not required for normal S/370 operation of the 2540. *Required if 1401/1440/1460 Compatibility (#3950) is used on a 4331 ... not required for normal 4300 Processor operation of the 2540.*

TWO CHANNEL SWITCH (#8100). [Models 1, 2, 3, 5 only] [Plant installation only] To attach the 2821 to a second channel. Switching is under program control. Includes partitioning. For use in a S/360 mdl 67, a multiprocessor S/360 mdl 65, or a S/370 mdl 158 MP or 168 MP only. **Prerequisites:** If the Two Channel Switch is routed through the Configuration Control Panel (#1505) of a multiprocessor S/360 mdl 65, Remote Switch Attachment (#6148) is required. #6148 is also required in a S/360 mdl 67-2, or a S/370 mdl 158 MP or 168 MP. See above. For a 2821 mdl 1 or 5, a Two Channel Switch Adapter (#8102) is required on the attached 2540.

UNIVERSAL CHARACTER SET ADAPTER (#8637-8639). [Models 1, 2, 3, 5 only] Required for Universal Character Set Feature (#8641 on 1403 mdl 2, #8640 on 1403 mdl 3 or N1) ... one adapter is required for each printer so equipped. **Note:** A 1403 previously equipped with a Multiple Character Set Feature (#5110 on 1403 mdl 2, #5111 on N1) can be attached to the 2821. The MCS Feature provides the same function as the UCS Feature on the printer.

- #8637 -- to attach such a printer to a 2821 mdl 1 or 2, or to Printer Control No. 1 on a 2821 mdl 3 or 5.
- #8638 -- to attach such a printer to Printer Control No. 2 on a 2821 mdl 3 or 5.
- #8639 -- to attach such a printer to Printer Control No. 3 on a 2821 mdl 3 or 5 ... #7945 is also required.

Special Feature Prices:	-FTP-						
	MAC/ MRC	MLC	MLC	1 Yr* 2 Yr	Purchase	MMMC	FIC
Column Binary	#1990	\$110	\$101	\$92	\$3,225	\$3.50	\$56
1,100 LPM Printer Adptr	3615	83	76	70	2,685	1.50	106
Isolation, Control Unit for mdl 4	4701	NC	NC	NC	NC	NC	NC
for mdl 1,2,3,5 w neither #8100 nor #8637-8639	4702	NC	NC	NC	NC	NC	NC
w #8637-8639 only	4703	NC	NC	NC	NC	NC	NC
w #8100 only	4704	NC	NC	NC	NC	NC	NC
w #8100 & #8637-8639	4705	NC	NC	NC	NC	NC	NC
Punch Feed Read Control	5895	60	55	50	1,835	2.50	66
Read-Compare Adapter	5991	83	76	70	3,810	2.00	92
Remote Switch Attach	6148	NC	NC	NC	NC	NC	NC
Selective Tape Listing Control for #6410 or #6411	6412	94	86	79	3,855	NC	102
for #6420	6425	94	86	79	3,855	NC	549
Third Printer Control	7945	562	517	472	21,490	10.00	PO
2540 Compatibility Attach	8065	NC	NC	NC	NC	NC	NC
Two Channel Switch	8100	223	205	187	9,425	12.50	PO
Universal Character Set Adapter for Printer Cntrl No. 1	8637	16	15	13	684	4.50	401
for Printer Cntrl No. 2	8638	16	15	13	684	4.50	267
for Printer Cntrl No. 3	8639	16	15	13	684	4.50	267

* FTP is 12-23 months.

* FTP is 12-23 months.



2822 PAPER TAPE READER CONTROL

Purpose: Control unit for a 2671 Paper Tape Reader in a S/360 mdl 22, 25, 30, 40, 44, 50, 67, a S/370 mdl 115 thru 158, a 3031 or 3032 Processor, or a 4300 Processor.

Highlights: Provides status and data information from the 2671 to the processing unit ... checks for parity ... signals end of record and end of tape ... code translation, where required, is performed by the processing unit.

Prerequisite: A control unit position on a system channel:

S/360 mdl 25 -- special feature on 2025: Multiplexer Channel or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, Add'l High Speed Multiplexer Subchannels ... see 2044.

S360 mdl 67 -- basic multiplexer channel of 2870 ... see 2870.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channels (special features), Block Multiplexer Channel (special feature) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel (standard), selector channel (one is standard), Block Multiplexer Channel (special feature) ... see 3145.

S370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Isolation, Control Unit: May be required on units shipped prior to December 29, 1967 ... see "Special Features" below.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	2822 1	\$235†	\$8,630	\$ 11

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: B Per Call: 3 Warranty: B
Metering: I/O Unit (online, meter on 2671) Purchase Option: 55%

SPECIAL FEATURES

ISOLATION, CONTROL UNIT (#4700). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2822 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements,

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Isolation, Control Unit #4700	NC	NC	NC	NC

† Manufactured in France. Freight charges from point of shipment in U.S.A.

**2835 STORAGE CONTROL**

Purpose: Control unit for 2305 Fixed Head Storage(s) in a S/360 mdl 85, 195, S/370 mdl 145, 145-3, 148, 155, 158, 165, 168, 195, a 3031, 3032 or 3033 Processor, or any 4300 Processor.

Model 1 For attachment of 2305 mdl 1s.

Model 2 For attachment of 2305 mdl 2s.

Model Changes: Cannot be made in the field.

Highlights: Up to two 2305 mdl 1s can be attached to a 2835 mdl 1 ... a total data capacity of up to 10.8 million 8-bit bytes. Data is transferred to and from a group of non-shared subchannels of a 2880 or the block multiplexer channel of a 3031, 3032 or 3033, at a rate of 3.0 million bytes/second.

Up to two 2305 mdl 2s can be attached to a 2835 mdl 2 ... a total data capacity of up to 22.4 million bytes. Data is transferred to and from a group of non-shared subchannels of a 2880 or the block multiplexer channel of a 3031, 3032 or 3033 at a rate of 1.5 million bytes/second.

A pattern of correction code bytes is automatically recorded after each count, key, and data area. Error detection and correction is accomplished by decoding the bytes generated while reading and comparing with the recorded bytes.

File organization and format are under program control, allowing data and key fields to be variable in length on an individual record basis.

Greater utilization of available storage is made by allowing a record to "overflow" from one track to another. Logical files are protected by a combination of commands in the 2835 and checks within the control program.

Multiple track operation allows search and read operations to proceed from track to track. Command chaining allows multiple records to be read/written by a sequence of channel commands, without rotational delays between records.

Rotational positional sensing allows the channel to "seek" to an angular track position by using the "Set Sector" command. This permits disconnection during most of the rotational latency period and thus contributes to increased channel availability. The unit attaches to the 2880 Block Multiplexer Channel or integrated block multiplexer channel of a 3145, 3145-3, 3148 or 3155 and will accept and properly act upon the "Set Sector" and "Read Sector" commands.

Multiple requesting is provided which allows for chain or command queuing within the 2835. This is accomplished by allowing multiple (up to 16) channel command chains to be active in the facility. For more information, see the 2305 Fixed Head Storage.

Limitations:

2305 mdl 1 and mdl 2 cannot be intermixed on the same 2835.

S/370 mdl 145 -- 2835 mdl 1 cannot be attached ... the 2835 mdl 2 must be attached to channel 2 on 3145 IFA systems ... the Word Buffer (#8810) is required on the 3145.

S/370 mdl 145-3, 148 -- 2835 mdl 1 cannot be attached.

S/370 mdl 155, 158 or 3031 Processor -- 2835 mdl 1 cannot be attached ... 2835 mdl 2 can be attached only to the first and second block multiplexer channels ... no more than two may be attached to any one channel.

4341 Processor -- 2835 mdl 1 cannot be attached.

Prerequisites: A control unit position on a block multiplexer channel of a 3145, 3145-3, 3148, 3155, 3158, 3031, 3032, 3033 or 4341, or a 2880 Block Multiplexer Channel ... Word Buffer (#8810) is required on the 3145 ... the 2835 mdl 1 also requires Two Byte Interface (#7850, 7851) on the 2880 or on the 3032 or 3033 channel to which it is attached.

The 2835 is designed for interconnected operation as part of a 2835/2305 facility. Customers who wish to order a 2835 for stand-alone or individual use should submit an RPQ to provide the necessary safety elements (covers, cable connectors, etc.) to complete the unit for a non-standard (i.e., not interconnected with a 2305) environment. In lieu of the RPQ, the customer may provide safety elements equivalent to the standard 2835/2305 configuration or that provided by the above RPQ. If not provided, the unit will be offered on a purchase-only basis.

Agreement for IBM to install and maintain the 2835 in any non-standard environment must be reviewed

"Specify."

... see item [3] under

Bibliography: S/360 -- GC20-0360 S/370 -- GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Non-standard Environment: #9485 ... must be specified if the 2835 is not to be installed as part of a 2305-2835 combination.

[4] Two Drive Facility: #9702 ... must be specified if two 2305s are to be attached to the 2835. **Note:** If a second drive is to be field installed, #9702 must be ordered Refer to 2305 for further ordering instructions.

PRICES:

Mdl	MAC/ MRC	-- FTP/ --		Purchase	MMMC	
		MLC 1 Yr*	MLC 2 Yr			
2835	1	\$3,245	\$2,985	\$2,726	\$76,860	\$286
	2	2,705	2,489	2,272	63,630	244

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Maintenance: A Per Call: 3 Warranty: B

Metering: Assignable Unit Purchase Option: 45%

Useful Life Category: 1 Upper Limit Percent: 0%

Termination Charge Months: 5 Termination Charge Percent: 25%

Model/Feature Additional Charge in lieu of AU Charge: 10%

SPECIAL FEATURES

REMOTE SWITCH ATTACHMENT (#6148, 6149). To attach the Two Channel Switch (#8170, 8171) to the configuration control panel of a S/370 mdl 158 MP or 168 MP. #6148 -- for 2835 mdl 1 ... #6149 -- for 2835 mdl 2.

TWO CHANNEL SWITCH (#8170, 8171). To attach the 2835 to a second channel, allowing two S/360s, S/370s or 4341s, or two channels of the same S/360, S/370 or 4341, access to a common data capacity under program control. #8170 -- for 2835 mdl 1 ... #8171 -- for 2835 mdl 2.

Special Feature Prices:	MAC/ MRC	-- FTP/ --		Purchase	MMMC	FIC
		MLC 1 Yr*	MLC 2 Yr			
Remote Switch Attachment						
for Model 1	#6148	NC	NC	NC	NC	NC
for Model 2	6149	NC	NC	NC	NC	NC
Two Channel Switch						
for Model 1	8170	\$215	\$198	\$181	\$5,125	\$7.00 \$359
for Model 2	8171	215	198	181	5,125	7.00 694

* FTP is 12-23 months.



2840 DISPLAY CONTROL (Model 1)

The 2840 Display Control mdl 1, used for control of 2250 Display Unit mdl 2s, is no longer available ... the following special feature is available for field installation on installed units.

ABSOLUTE VECTORS CONTROL (#1003). Controls which permit attached 2250 mdl 2s equipped with Absolute Vectors (#1001) to "draw" a continuous straight line between any two points of their 1,024 x 1,024 reference grids. **Maximum: One.**

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Absolute Vectors Cntrl #1003	\$217	\$8,715	\$8.00	\$203

2840 DISPLAY CONTROL (Model 2)

Purpose: Control unit that provides common circuits for multiple 2250 Display Unit mdl 3s in a S/360 mdl 22, 30 thru 85, 195, any S/370 Processor, or any 4300 Processor.

Limitation: Cannot be used for 2250 mdl 1s.

Highlights: Provides controls and attachments for up to two 2250 mdl 3s. With Display Multiplexer (#3352), up to four 2250 mdl 3s can be controlled. See "Special Features." Each 2250 mdl 3 can be located 2,000 cable feet from the 2840. Includes 32,768 bytes of core buffer, a character generator, absolute vectors control, the 2250 set of eleven orders, and an additional set of orders for graphic design applications.

Prerequisites: A control unit on a system channel and a minimum of 64K bytes of processor storage for use of graphic support under OS ... a minimum of 16K for diagnostic support only.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features, except on 2022 one is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, Add'l High Speed Multiplexer Subchannels ... see 2044.

S/360 mdl 65, 67, 75 -- selector channel of 2860, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 85, 195, or S/370 mdl 165, 168, 195 -- selector channel of 2860, Selector Subchannels (special features) on 2870, shared subchannel of 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channel or Block Multiplexer Channel ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.

Bibliography: S/360 - GC20-0360 S/370 - GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	2840	2	\$4,345	\$80,900 \$183

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Assignable Unit Maintenance: B
Purchase Option: 50% Warranty: B

SPECIAL FEATURES

DISPLAY MULTIPLEXER (#3352). Provides two additional attachments for two 2250 mdl 3s. **Maximum: One.**

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Display Multiplexer #3352	\$437	\$8,990	\$16.00	\$407

2860 SELECTOR CHANNEL

Purpose: Selector channel(s) for attachment and control of a wide variety of I/O control units for a S/360 mdl 65 thru 195, or a S/370 mdl 165, 168, 195.

- Model 1** Has one selector channel.
- Model 2** Has two selector channels.
- Model 3** Has three selector channels.

Model Changes: Available at time of manufacture only.

Highlights: Channels permit data rates up to 1.3 million bytes/second. A full set of channel control and buffer registers permit each channel to operate with minimal interference. Up to eight I/O control units can be attached to each channel, permitting a wide variety of attached devices. I/O operations are overlapped with processing and, depending upon the data rate, all channels can operate simultaneously.

Maximum:

S/360 mdl 65, 67-1 (2067 mdl 1), 75 -- up to two 2860s in any combination of models can be attached. Up to two 2870 Multiplexer Channels can also be attached. Total channels (both 2860 and 2870) cannot exceed seven per CPU.

Limitations: On either a 65 MP system with eight 2365 mdl 13 frames, or on a system with four 2361 mdl 2s, only three channel frames or seven logical channels, whichever occurs first, can be attached. The 2860 may only use channel addresses 1 through 6. If no 2870s are attached, only up to six logical channels can be attached per CPU.

S/360 mdl 67-2 (one or two 2067 mdl 2s) -- up to two 2860s in any combination can be attached to each 2846 Channel Controller. A 2870 Multiplexer Channel can also be attached to each 2846.

S/360 mdl 85, 195, or S/370 mdl 165, 168, 195 -- up to two 2860s in any combination of models can be attached. 2870 Multiplexer Channels and 2880 Block Multiplexer Channels can also be attached. For combinations possible, see 3165, 3168 or 3195.

Prerequisites:

With 2065 or 2067 mdl 1 -- Channel Attachment (#9065) is required to attach channels addressed 3 and 4. Channel Attachment (#9066) is required in addition to #9065 to attach channels addressed 5 and 6. See "Specify" under 2065 and 2067.

With 2067 mdl 2 -- a 2846 Channel Controller is required.

With 2075 -- a 2075 Attachment (#9820) is required on each 2860 ... see "Specify."

With 2085 -- a 2085 Attachment (#9821) is required on each 2860 ... see "Specify." On the 2085, Channel Attachment (#9065) is required to attach channels addressed 3 and 4. Channel Attachment (#9066) is required in addition to #9065 to attach channels addressed 5 and 6. Consult Special Product Marketing.

With 3195 -- a 3195 Attachment (#9828) is required on each 2860 ... see "Specify."

With 3165, 3168, 3168-3 -- a 3165/3168/3168-3 Attachment (#9830) is required on each 2860 ... see "Specify." When attaching this channel to a S/370 mdl 165, the 3165 must have sufficient addressing capability ... see "Channel Attachment" under "Specify" for the 3165. For S/370 mdl 165 systems, the power distribution unit must be equipped for at least the number of frames actually attached ... see "Channel Frames" under "Specify" for the 3067 mdl 1. Channel Indirect Data Addressing feature is required for a system operating in EC mode ... see "Special Features."

Isolation: Appropriate features are required on any 2860 shipped prior to September 7, 1967 ... see "Special Features."

Bibliography: S/360 -- GC20-0360 S/370 -- GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

- [2] Method of Installation: #9400, if 2860 will not be installed on a raised floor.
- [3] 2075 Attachment: #9820 ... required for attachment to a 2075.
- [4] 2085 Attachment: #9821 ... required for attachment to a 2085.
- [5] 3195 Attachment: #9828 ... required for attachment to a 3195.

[6] 3165/3168/3168-3 Attachment: #9830 ... required for attachment to a 3165, 3168, or 3168-3.

[7] Unit Position: Required on 2860s when more than one unit, either 2860 or 2870, is attached to a 2065, 2067 mdl 1, 2075, 2085, 2846, or 3165. Specify #9501 on each 2860 that is not attached last on the channel bus. If the 2860 is to be last (only when there is no 2870) no code is required. When field installing an additional 2860 which will be last on the bus, order #9501 for the installed 2860 that is currently last on the bus. All orders for #9501 must give the model, serial number and special features on the installed 2860. On the 3168, 3168-3 or 3195, the bus is two cable strings to which the channels are attached. Therefore, for each string specify #9501 for each 2860 that is not attached last on that string. If the 2860 is last on either string, no code is required. When field installing an additional 2860 which is to be last on the string, order #9501 for the installed 2860 that is currently last on the string.

[8] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[9] Two-processor System: A 2860 that is to be used in a S/360 mdl 67-2 with two 2067 mdl 2s requires Address Prefixing (#1095) ... see "Special Features."

[10] 2301 Drum Storage: In a S/360 mdl 67-2, or a S/370 mdl 165, High Speed Direct Access Storage Priority (#4597) is required on the selector channel to which the 2820 Storage Control for the 2301 is to be attached ... see "Special Features."

[11] Isolation Features: Appropriate features must be ordered for field installation on units shipped prior to September 7, 1967 ... see "Special Features."

PRICES:	mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMM
2860	1	\$2,400	\$2,185	\$112,050	\$63.50
	2	3,420	3,110	159,600	103.00
	3	4,455	4,050	206,600	144.00

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Maintenance: B Per Call: 3 Warranty: B
 Metering: Assignable Unit Purchase Option: 65%
 Termination Chg Months: 6 Termination Chg Percent: 25%
 Model/Feature Additional Charge in lieu of AU Charge: 15%
 Upper Limit Percent: 5%

SPECIAL FEATURES

ADDRESS PREFIXING (#1095). [For use in a S/360 mdl 67-2 only] One is required on each selector channel in a two-processor system ... provides prefixing to identify the processing unit that has initiated an I/O operation. **Specify:** #9026 for first channel of 2860 ... #9047 for second ... #9048 for third. **Maximum:** One per 2860 mdl 1, two per 2860 mdl 2, three per 2860 mdl 3.

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two system channels ... only one of the two connected channels requires this feature. The feature uses one control unit position on each of the channels. The plant must know on which of the three possible 2860 channel gates the adapter is to be installed. **Specify:** #9095 for installation on first gate ... #9096 for second gate ... #9097 for third gate. **Maximum:** One per gate.

CHANNEL INDIRECT DATA ADDRESSING (#1861-1863). For use on a S/370 mdl 165 II or 168 ... 3165/3168/3268-3 Attachment (#9830) is required on channel. One is required on each selector channel to provide indirect access for data transfer. Required for a system operating in EC mode. #1861 -- for 2860 mdl 1 ... #1862 for 2860 mdl 2 ... #1863 for 2860 mdl 3. **Maximum:** One per 2860.

HIGH SPEED DIRECT ACCESS STORAGE PRIORITY (#4597). [For use in a S/360 mdl 67-2 or 85, or S/370 mdl 165 only] Gives storage priority to a 2301 Drum over all other devices in the system. Required on a 2860 channel to which a 2301 is attached in the above systems. **Specify:** #9171 for installation on first channel ... #9172 on second channel. **Maximum:** In a S/360 mdl 67-2, only one #4597 may be attached to a 2860, regardless of model. Although two 2860s may be attached to a 2846, only one may have this feature. In a S/360 mdl 85 or S/370 mdl 165, up to two features may be used, but they must be located on the first 2860 in the system. **Prerequisite:** Storage Priority (#7516) on the 2820 Storage Control associated with the 2301.

3803 MODEL 2 ATTACHMENT (#7850). One is required for each 2860 channel to which 3803 mdl 2s are attached. **Specify:** #9181 for first channel of a 2860 ... #9182 for second channel ... #9183 for third channel. **Maximum:** One for 2860 mdl 1 ... two for 2860 mdl 2 ... three for 2860 mdl 3.



2860 Selector Channel (cont'd)

Special Feature Prices:		TLP/ MAC/MLC				
		MRC	4 Yr	Purchase	MMMC	FIC
Address Prefixing	#1095	\$44	\$40	\$1,930	\$2.00	\$563
Chnl-to-Chnl Adapter	1850	256	233	10,820	4.00	197
Channel Indirect Data Addressing						
for 2860 mdl 1	1861	171	156	7,995	2.00	1,760
for 2860 mdl 2	1862	342	311	15,940	3.00	3,425
for 2860 mdl 3	1863	515	469	23,910	5.50	5,080
High Speed Direct						
Access Strg Priority	4597	16	15	772	2.00	340
3803 Mdl 2 Attachment	7850	23	21	1,140	1.00	299

ISOLATION FEATURES -- the following features, as appropriate, must be ordered for field installation on each 2860 installed or shipped prior to September 7, 1967.

ISOLATION, 2860 CHANNEL (#4611-4613). Permits power to be turned on or off on the 2860 without introducing transient noise signals on the I/O interface bus during the powering operation. #4611 -- for 2860 mdl 1 ... #4612 -- for 2860 mdl 2 ... #4613 -- for 2860 mdl 3. **Maximum:** One per 2860.

ISOLATION, ON CHANNEL-TO-CHANNEL ADAPTER (#4621-4623). Permits power to be turned on or off on the 2860 without introducing transient noise signals on units attached via Channel-to-Channel Adapter(s) (#1850) during the powering operation. #4621 -- if there is only one #1850 on the 2860 frame ... #4622 -- if there are two #1850s ... #4623 -- if there are three #1850s. **Maximum:** One, #4621, #4622, or #4623. **Prerequisites:** For #4621, one #1850 ... For #4622, two #1850s ... For #4623, three #1850s.

Special Feature Prices:		TLP/ MAC/MLC				
		MRC	4 Yr	Purchase	MMMC	FIC
Isolation						
2860 Channel						
for model 1	#4611	NC	NC	NC	NC	NC
for model 2	4612	NC	NC	NC	NC	NC
for model 3	4613	NC	NC	NC	NC	NC
On Chnl-to-Chnl Adapter						
with one #1850	4621	NC	NC	NC	NC	NC
with two #1850s	4622	NC	NC	NC	NC	NC
with three #1850s	4623	NC	NC	NC	NC	NC

2870 MULTIPLEXER CHANNEL

Purpose: For attachment of a wide variety of low to medium speed I/O control units and devices to a S/360 mdl 65, 67, 85, 195, or S/370 mdl 165, 168, 195.

Highlights: Provides up to 196 subchannels ... including four Selector Subchannels. See "Special Features." Aggregate data rates range from 110KB to 670KB, depending upon the features installed.

The basic channel can attach up to eight I/O control units and can address up to 192 I/O devices. Up to four Selector Subchannels can be added, each of which can operate one device simultaneously with the basic channel. Up to eight I/O control units can be attached to each Selector Subchannel. If one 2841 is attached, no other control unit can be attached to that Selector Subchannel ... see 2841. A maximum of sixteen devices can be attached to each Selector Subchannel. The first 2870 attached to a System must be assigned address zero (0). The second 2870 may be assigned any address 1 through 6, dependent upon the total number of channels installed and the priority desired ... see Functional Characteristics SRL for the using system.

Maximum aggregate data rates are shown in the following table. These are machine rates for the 2870 ... for S/360 mdl 65, 67-1, 75 and 85, or S/370 mdl 165, 168 or 195, information on system data rates may be found in the appropriate Functional Characteristics SRL.

Basic Channel	SELECTOR SUBCHANNELS			
	1st #6990	2nd #6991	3rd #6992	4th #6993
110KB	*	*	*	*
88KB	180KB	*	*	*
66KB	180KB	180KB	*	*
44KB	180KB	180KB	180KB	*
30KB	180KB	180KB	180KB	100KB

* Not installed.

Maximum:

S/360 mdl 65, 67-1 (2067 mdl 1), 75 -- two 2870s can be attached ... up to two 2860 Selector Channels in any combination of models can also be attached. The total number of channels (both 2870s and 2860s) cannot exceed seven per CPU. **Limitations:** On either a 65 MP system with eight 2365 mdl 13 frames or on a system with four 2361 mdl 2s, only three channel frames or seven logical channels, whichever occurs first, can be attached. If no 2870s are attached only up to six logical channels can be attached per CPU. The first 2870 address must be zero and the second is assigned an available address from 1 to 6.

S/360 mdl 67-2 (one or two 2067 mdl 2s) -- one 2870 can be attached to each 2846 Channel Controller ... up to two 2860 Selector Channels in any combination of models can also be attached to each 2846.

S/360 mdl 85, 195 and S/370 mdl 165, 168, 195 -- two 2870s can be attached. 2860 Selector Channels and 2880 Block Multiplexer Channels can also be attached. For combinations possible, see 3165, 3168, 3168-3 or 3195.

Note: The 2870 may be connected to another system channel for channel-to-channel interconnection of two system channels. However, the Channel-to-channel Adapter required for this interconnection must be installed on the other channel, not the 2870 ... unbuffered devices precede buffered devices. A 2821 Control Unit should normally be last in priority because of the high instantaneous data rates.

Prerequisites:

With 2065 or 2067 mdl 1 -- Channel Attachment (#9065) is required to attach channels addressed 3 and 4. Channel Attachment (#9066) is required for channels addressed 5 and 6. See "Specify" under 2065 or 2067.

With 2067 mdl 2 -- a 2846 Channel Controller is required.

With 2075 -- a 2705 Attachment (#9820) is required on each 2870 ... see "Specify."

With 2085 -- a 2085 Attachment (#9821) is required on each 2870 ... see "Specify." On the 2085, Channel Attachment (#9065) is required to attach channels addressed 3 and 4. Channel Attachment (#9066) is required for channels addressed 5 and 6. Consult Special Product Marketing Support.

With 3195 -- a 3195 Attachment (#9828) is required on each 2870 ... see "Specify."

With 3165, 3168, 3168-3 -- a 3165/3168/3168-3 Attachment



2870 Multiplexer Channel (cont'd)

(#9830) is required on each 2870 ... see "Specify." When attaching this channel to a S/370 mdl 165, the 3165 must have sufficient channel addressing capability ... see "Channel Attachment" under "Specify" for the 3165. For S/370 mdl 165 systems, the power distribution unit must be equipped for at least the number of frames actually attached ... see "Channel Frames" under "Specify" for the 3067 mdl 1. Channel Indirect Data Addressing (#1861) is required for a system operating in EC mode ... see "Special Features." **Isolation Feature:** An appropriate Isolation Feature is required on any 2870 shipped prior to December 29, 1967 ... see "Special Features."

Bibliography: S/360 -- GC20-0360 S/370 -- GC20-0001

Specify: [1] Voltage (AC, 3-phase, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Method of Installation: #9400, if 2870 will not be installed on a raised floor.

[3] 2075 Attachment: #9820 ... required for attachment to a 2075.

[4] 2085 Attachment: #9821 ... required for attachment to a 2085.

[5] 3195 Attachment: #9828 ... required for attachment to a 3195. **Note:** 2870s serial no. 70,000 to 79,999 must be used with a 3195.

[6] 3165/3168/3168-3 Attachment: #9830 ... required for attachment to a 3165, 3168 or 3168-3. **Note:** 2870 serial nos. 70,000 to 79,999 must be used with a 3165, 3168 or 3168-3.

[7] Unit Position: The 2870 is normally last on the channel bus of a 2065, 2067 mdl1, 2075, 2085, 2846 or 3165. If two 2870s are installed, one should be last and the other next to last on the channel bus. #9501 must be specified for the 2870 which is next to last. The 2870 which is last does not require a code. All orders to add #9501 to an installed 2870 must specify the serial no. and special features on the installed unit. On the 3168, 3168-3 or 3195, the bus is two cable strings to which the channels are attached. Therefore, when one or two 2870s are installed, they should be last on separate strings. If on the same string, one should be last and the other next to last. #9501 must be specified for the 2870 which is next to last on the string. The 2870 which is last on either string does not require a code. **Note:** 2870s with serial nos. 60,002 through 69,999 must be installed as the first 2870 with channel address of zero on all systems except the S/360 mdl 195 or S/370 mdl 165.

[8] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[9] Two-processor System: A 2870 which is to be used in a S/360 mdl 67-2 with two 2067 mdl 2s requires Address Prefixing (#1095) ... see "Special Features."

[10] Isolation Feature: The appropriate Isolation Feature must be ordered for field installation on units shipped prior to December 29, 1967 ... see "Special Features."

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
	2870	1	\$2,500	\$2,275	\$117,900 \$145

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: B Per Call: 3 Warranty: B
Metering: Assignable Unit Purchase Option: 55%
Termination Chg Mnths: 6 Termination Chg Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

SPECIAL FEATURES

ADDRESS PREFIXING (#1095). [For use on a S/360 mdl 67-2 only] One required on each 2870 in a two-processor system ... provides prefixing to identify the processing unit that has initiated an I/O operation. **Maximum:** One per 2870.

CHANNEL INDIRECT DATA ADDRESSING (#1861). For use on a S/370 mdl 165 ll or 168 ... 3165/3168/3168-3 Attachment (#9830) is required on channel. Provides indirect address for data transfer. Required for a system operating in EC mode.

SELECTOR SUBCHANNEL (#6990-6993). Each Selector Subchannel permits attachment of up to eight I/O control units for devices with a data rate not exceeding 180KB ... see aggregate data rates possible under "Highlights." Each selector subchannel operates simultaneously with devices on the basic 2870 channel. **Limitation:** Regardless of the number of control units attached, a maximum of sixteen I/O devices can be attached to a selector subchannel. #6990 -- for first selector subchannel ... #6991 -- for second ... #6992 -- for third ... #6993 -- for fourth. **Maximum:** Four on the first or only 2870 (channel address 0) ... two (#6990 and #6991) on the second 2870 (channel address 1 through 6, depending on the number of 2860 and 2880 logical

channels also attached). On a 2065 MP, the maximums are: Four on the first 2870 ... none on the second. **Prerequisites:** #6991 requires #6990 ... #6992 requires #6991 ... #6993 requires #6992.

Special Feature Prices:	MAC/ MRC	TLP/ MLC 4 Yr Purchase	MMMC	FIC
Address Prefixing	#1095	\$129	\$118	\$5,565 \$3.50 *
Chnl Ind Data Addsg	1861	228	208	10,790 2.50\$3,040
Selector Subchannel				
first	6990	458	417	19,870 22.00 400
second	6991	285	260	12,010 13.50 200
third	6992	285	260	12,010 13.50 200
fourth	6993	285	260	12,010 13.50 200

*FIC: 2870 Serial Nos. 60,000 - 69,999 ... \$864
2870 Serial Nos. 70,000 - 79,999 ... \$119

ISOLATION FEATURES -- one of the following features, as appropriate, must be ordered for field installation on each 2870 shipped prior to December 29, 1967 ...

ISOLATION, CHANNEL-CONTROL UNIT (#4600, 4601). To turn power on or off on the 2870 without introducing noise signals on the I/O interface bus. #4600 -- for a 2870 with no Selector Subchannels ... #4601 -for a 2870 with one or more Selector Subchannels (#6990-6993). **Maximum:** One per 2870. **Prerequisite:** #4601 requires at least #6990.

Special Feature Prices:	MAC/ MRC	TLP/ MLC 4 Yr Purchase	MMMC	FIC
Isolation, Channel-Control Unit				
without #6990	#4600	NC	NC	NC NC NC
with #6990	4601	NC	NC	NC NC NC



2880 BLOCK MULTIPLEXER CHANNEL

Purpose: Block multiplexer channel(s) for attachment and control of a wide variety of I/O control units in a S/360 mdl 85, 195, or S/370 mdl 165, 168, 195.

- Model 1** Has one block multiplexer channel.
- Model 2** Has two block multiplexer channels.

Model Changes: Not recommended for field installation.

Highlights: Channels permit data rates up to 1.5 million bytes/second. With Two Byte Interface (#7850, 7851), data rates up to 3.0 million bytes/second are possible ... see "Special Features."

Provides up to 56 non-shared (block multiplex mode operation) subchannels per block multiplexer channel, allowing up to 56 block multiplex devices to operate concurrently in a burst interleaved mode on the single data path of the channel. Thus, although only one device may actually be transmitting data at any given instant, multiple channel programs may be concurrently active for up to 56 block multiplex devices at one time. Up to eight control units, of which seven may be block multiplexed, can be attached to each channel, permitting a wide variety of attached devices. There will always be one shared (non-block multiplex mode operation) subchannel having all addresses not assigned to non-shared subchannels. Subsequently, the shared channel will always have at least 200 unit addresses and may have up to 256 unit addresses, depending on the number of non-shared subchannels plugged during installation. With the Extended UCW feature installed, the capability of the channel to operate non-shared subchannels is extended from 56 to 256.

All block multiplex devices must be assigned to a non-shared subchannel. [Exception: The 2821 and 3811 control units may be attached to either type of subchannel, but non-shared subchannel attachment is recommended.]

Can be connected to a S/360 or S/370 selector channel via a Channel-to-channel Adapter (#1850) on the selector channel. *Can be connected to a 4341 Processor via a Channel to Channel Adapter of the block multiplexer channel of the 4341 Processor.*

I/O operations are overlapped with processing and, depending upon system considerations and upon data rate, all channels can operate simultaneously.

Maximum: Up to three 2880s (six channels), in any combination of models, can be attached. With Extended Channels (#3850) on the 2085, #3851 on the 3195, #3850 on the 3165, or #3855 on the 3168, up to six 2880s (twelve channels) may be attached to a 2085, up to seven 2880s (thirteen channels) may be attached to a 3195, or up to six 2880s (eleven channels) may be attached to a 3165, 3168 or 3168-3. See 3195, 3165, 3168 or 3168-3 for allowable channel combinations. For 2085, consult Special Product Marketing Support.

Limitation: A 2820 Storage Control equipped with Storage Priority (#7516) cannot be attached to a 2880.

Prerequisites:

With 2085 -- 2085 Attachment (#9821) is required on each 2880 ... see **Specify**. On the 2085, an appropriate Channel Attachment (#9065-9069) may be required. Consult Special Product Marketing Support.

With 3195 -- 3195 Attachment (#9828) is required on each 2880 ... see "Specify."

With 3165, 3168, 3168-3 -- a 3165/3168/3168-3 Attachment (#9830) is required on each 2880 ... see "Specify." When attaching the channel to a S/370 mdl 165, the 3165 must have sufficient channel addressing capability ... see "Channel Attachment" under "Specify" for the 3165. For S/370 mdl 165 systems, the power distribution unit must be equipped for at least the number of frames actually attached ... see "Channel Frames" under "Specify" for the 3067 mdl 1. Channel Indirect Data Addressing feature is required for a system operating in EC mode ... see "Special Features."

Bibliography: S/360 -- GC20-0360 S/370 -- GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] 2085 Attachment: #9821 ... required for attachment to a 2085.

[3] 3195 Attachment: #9828 ... required for attachment to a 3195.

[4] 3165/3168/3168-3 Attachment: #9830 ... required for attachment to a 3165, 3168 or 3168-3.

[5] Method of Installation: #9400, if 2880 will not be installed on a raised floor.

[6] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[7] Unit Position: #9505. For the mdl 165, #9505 must be specified on the 2880 which is last on the channel bus. For a mdl 168 or 195, where there are two cable strings, each 2880 which is last on a string must have #9505 specified. All orders to add #9505 to an installed 2880 must specify the serial number and special features on the installed unit.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
	2880 1	\$3,705	\$3,370	\$121,850	\$288
	2880 2	5,310	4,830	174,500	382

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: A Per Call: 3 Warranty: B
Metering: Assignable Unit Purchase Option: 45%
Useful Life Category: 1 Termination Chg Mnths: 6
Termination Chg Percent: 25% Upper Limit Percent: 5%
Model/Feature Additional Charge in lieu of AU Charge: 15%

SPECIAL FEATURES

CHANNEL INDIRECT DATA ADDRESSING (#1861, 1862). For use on a S/370 mdl 165 II or 168 ... 3165/3168/3168-3 Attachment (#9830) is required on channel. One is required on each channel to provide indirect address for data transfer. Required for a system operating in EC mode. #1861 -- for 2880 mdl 1 ... #1862 -- for 2880 mdl 2. **Maximum:** One per 2880.

EXTENDED UNIT CONTROL WORDS (#3851, 3852). Extends channel storage to 256 control words. May be installed on either or both channels of a 2880 mdl 2. #3851 -- for mdl 1 or first channel of a mdl 2 ... #3852 -- for second channel of a mdl 2. **Limitation:** Cannot be installed on the same channel with #7850 or #7851, RPQ WE4259 channel-to-channel adapter and specify feature 2085 Attachment (#9821). **Field Installation:** Yes.

TWO BYTE INTERFACE (#7850, 7851). One is required on each channel attaching a 2835 Storage Control mdl 1 for 2305 Fixed Head Storage(s). #7850 -for a 2880 mdl 1 or the first channel of a 2880 mdl 2 ... #7851 -- for the second channel of a 2880 mdl 2. **Limitation:** Cannot be installed on the same channel with #3851 or #3852. **Field Installation:** Yes.

Special Feature Prices:	TLP MAC/MLC MRC	4 Yr	Purchase	MMMC	FIC
Channel Indirect Data Addressing					
for 2880 mdl 1	#1861	\$171	\$156	\$5,650	\$1,00\$1,540
for 2880 mdl 2	1862	342	311	11,240	2.00 3,090
Extended Unit Control Words					
for mdl 1 or 1st					
chnl of mdl 2	3851	415	378	13,100	4.50 370
for 2nd chnl of mdl 2	3852	415	378	13,100	4.50 370
Two Byte Interface					
for mdl 1 or 1st					
chnl of mdl 2	7850	432	393	14,220	5.00 2,645
for 2nd chnl of mdl 2	7851	432	393	14,220	5.00 2,645



DP Machines

3017 POWER UNIT

Purpose: Provides power for a 3031 Processor or Attached Processor Complex.

Highlights: One 3017 Power Unit is required with each 3031 Processor ... two 3017s are required in an Attached Processor Complex.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.

[3] Cabling: #9080 for below floor, or #9081 for on the floor.

[4] Unit Emergency Power Off: See S/370 Installation Manual - Physical Planning, GC22-7004, for details.

PRICES:	Mdl	Monthly Rental Charge	Monthly Lease Charge 4 Year	Purchase	MMMC
3017	1	\$462	\$420	\$20,000	\$30

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Base Unit (meter on 3036) Maintenance: A
 Warranty: B Purchase Option: 55% Per Call: 3
 Useful Life Category: 2 Upper Limit Percent: 5%
 Termination Charge Months: 6 Termination Charge Percent: 25%
 Model/Feature Additional Charge in lieu of AU Charge: 15%

M 3017 - 3027
May 79

3027 POWER AND COOLANT DISTRIBUTION UNIT

Purpose: Provides power and coolant distribution required by a 3032 Processor Complex.

Highlights: One 3027 is required with each 3032 Processor.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.

PRICES:	Mdl	Monthly Rental Charge	Monthly Lease Charge 4 Year	Purchase	MMMC
3027	1	\$3,825	\$3,480	\$160,000	\$210

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Maintenance: D Per Call: 3 Purchase Option: 55%
 Metering: Base Unit (meter on 3036)
 Warranty: B Useful Life Category: 2
 Termination Charge Months: 6 Termination Charge Percent: 25%
 Model/Feature Additional Charge in lieu of AU Charge: 15%
 Upper Limit Percent: 5%

[3] Unit Emergency Power Off: See S/370 Installation Manual - Physical Planning, GC22-7004, for details.



DP Machines

M 3031
May 79

IBM 3031 PROCESSOR

Purpose: Performs arithmetic, logic, processor storage, channel, and control functions for a 3031 Processor or Attached Processor Complex. 3031 A models are used with a 3041 Attached Processor.

Model	Bytes of Processor Storage
2 A2	2,097,152
3 A3	3,145,728
4 A4	4,194,304
5 A5	5,242,880
6 A6	6,291,456

Highlights: Depending on the model, contains up to 6,291,456 bytes of monolithic processor storage ... processor cycle time of 115 nanoseconds ... eight-byte parallel data flow with four-way interleaving ... 128 word instruction buffer ... processor functions are controlled by reloadable control storage ... includes 32,768 bytes of buffer storage which is transparent to the programmer and reduces the effective cycle time of processor storage ... sixteen general purpose and four floating point registers are implemented in high speed internal circuits with a four-byte data flow to the I/E function.

Standard Features: S/370 Universal Instruction Set ... extended precision floating point ... interval timer ... store and fetch protect ... byte oriented operand feature ... main storage error checking and correction ... instruction retry ... dynamic address translation ... extended control mode ... program event recording ... one microsecond time-of-day clock with clock comparator ... one microsecond CPU timer ... buffer storage (32,768 bytes) ... reloadable control storage ... physically integrated channels ... VMA & OS/VS1 ECPS ... S/370 Extended Facility ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... storage configuration control ... clear I/O ... Unit Emergency Power Off.

Channels: Six channels are standard: One byte multiplexer channel and five block multiplexer channels. The byte multiplexer channel is capable of a data rate of 40 to 75 kilobytes per second. A block multiplexer channel is capable of a data rate of up to 1.5 megabytes per second. 256 subchannels per channel, of which up to eight subchannels per channel may be shared. Channel Indirect Addressing is standard. One optional channel-to-channel adapter.

PREREQUISITES: Each 3031 requires one 3036 Console and one 3017 Power Unit. Two 3017 Power Units, a 3036 Console, a 3041 Attached Processor, and a 3031 Processor Model A are required in an Attached Processor Complex. See *S/370 Installation Manual - Physical Planning, GC22-7004*.

Bibliography: GC20-0001

SPECIFY

- Voltage** (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
- Unit Emergency Power Off:** See S/370 Installation Manual - Physical Planning, GC22-7004, for details.
- Color:** #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.
- Cabling:** Cables can be used above or below the floor ... no specify required.
- Minimum Configuration:** See "Minimum Configurations" in "Systems" for minimum I/O units required in a 3031 Processor Complex.
- RETAIN/370:** The capability of using remote service/logout analysis facility is standard. Customer must provide interface for this facility to the telephone line if he desires the feature to be used.

PRICES:	Mdl	MRC	MLC 4 Yr	Purchase	MMMC
3031	2	\$23,450	\$21,320	\$830,000	\$2,450
	3	26,490	24,090	905,000	2,590
	4	29,530	26,860	980,000	2,730
	5	33,080	30,100	1,070,000	2,930
	6	36,120	32,870	1,145,000	3,070
	A2	23,910	21,740	850,000	2,505
	A3	26,950	24,510	925,000	2,645
	A4	29,990	27,280	1,000,000	2,785
	A5	33,540	30,520	1,090,000	2,985
	A6	36,580	33,290	1,165,000	3,125

MLC MLC
35 38.9

318 34.9

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3036) Maintenance: D
Warranty: A Purchase Option: 55% Per Call: 3
Useful Life Category: 2 Upper Limit Percent: 5%
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From	To	3	4	5	6
2		\$75,000			
3			\$75,000		
4				\$90,000	
5					\$75,000
From	To	A3	A4	A5	A6
A2		\$75,000			
A3			\$75,000		
A4				\$90,000	
A5					\$75,000

MODEL CONVERSION PURCHASE PRICE - 3031 to 3031 A Model (no change in memory size)
\$20,000

SPECIAL FEATURES

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (either S/360, S/370 or 4341 Processor). Only one of the processors requires this feature. Uses one control unit position on each of the connected channels. Function can be expanded under program control so that the adapter will operate as a standard control unit. **Maximum:** One. **Field Installation:** Yes.

DIRECT CONTROL (#3274). Provides two instructions, "Read Direct" and "Write Direct", and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes, between two cable-connected processors or a cable-connected processor and external devices. The read and write instructions must use real addresses only. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in *S/370 Direct Control Feature - OEMI, GA22-6845*.

Special Feature Prices:	MRC	MLC 4 yr	Purchase	MMMC
Chnnl-to-chnnl Adapter #1850	\$410	\$375	\$15,000	\$10.00
Direct Control	3274	104	95	3,700
				1.50



IBM 3032 PROCESSOR

Purpose: Provides arithmetic, logic, processor storage, channels and control functions for a 3032 Processor Complex.

Model 2	2,097,152 bytes of processor storage
Model 4	4,194,304 bytes of processor storage
Model 6	6,291,456 bytes of processor storage

Highlights: Depending upon the model, can contain up to 6,291,456 bytes of monolithic processor storage ... double-word storage accesses are four-way interleaved ... eight-byte parallel data flow ... includes 32,768 bytes of buffer storage which is transparent to the program and significantly reduces the effective access time of storage ... buffer storage does not increase the amount of addressable storage ... 80 nanosecond processor cycle ... overlapped operation of instruction preprocessing and execution functions ... extensive data checking is coupled with increased availability and serviceability. Improved instruction execution rates over the 315B-3. Improved availability and serviceability through dual console and main storage reconfiguration functions.

Standard Features: Universal Instruction Set ... extended precision floating point ... one-microsecond time-of-day clock with clock comparator ... one-microsecond CPU timer ... dynamic address translation ... channel indirect data addressing ... extended control mode ... program event recording ... monitoring ... byte-oriented operand feature ... buffer storage (32,768 bytes) ... fetch and store protection ... direct control feature ... six channels ... S/370 Extended Facility ... remote log analysis and remote support facilities ... storage configuration control ... reloadable control storage ... interval timer ... processor storage error checking and correction ... instruction retry ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... clear I/O.

Channels: Six functionally independent channels in one group are standard. A group consists of one byte multiplexer channel and five block multiplexer channels. Single block multiplexer channel speed of up to 1.5 million bytes/second is standard and up to 3 million bytes/second with the Two-Byte Interface (#7850). Each byte multiplexer channel will generally operate in the range of 40-75 KB/second. Each channel has 256 subchannels, of which up to 8 subchannels/channel may be shared. One optional channel-to-channel adapter per processor is available ... see "Special Features."

With the addition of Extended Channels (#3850), a group of five additional block multiplexer channels and one byte multiplexer channel may be added. Availability and serviceability are improved with the addition of this second group through the independent maintenance capability of each channel group.

Prerequisites: Each 3032 requires [1] One 3027 Power and Coolant Distribution Unit ... [2] One 3036 Console ... and [3] An appropriate 415 Hz power input. Customer-supplied chilled water is required for cooling the system. See S/370 Installation Manual - Physical Planning, GC22-7004.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Motor Generator and Starter: If desired, see M 10000 pages for ordering instructions and prices.

[3] Unit Emergency Power Off: See S/370 Installation Manual - Physical Planning, GC22-7004, for details.

[4] Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.

PRICES	Mdl	MRC	MLC 4 Yr	Purchase	MMMC
3032	2	\$40,700	\$37,000	\$1,590,000	\$5,700
	4	47,550	43,240	1,762,000	6,020
	6	53,840	48,970	1,918,000	6,310

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: D Per Call: 3 Warranty: A
Purchase Option: 55% Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Metering: Base Unit (meter on 3036) Upper Limit Percent: 5%

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From	To	4	6
2		\$172,000	
4			\$156,000

SPECIAL FEATURES

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (either S/360, S/370 or 4341 Processor). Only one of the processors requires this feature. Uses one control unit position on each of the connected channels. Function can be expanded under program control so that the adapter will operate as a standard control unit. **Limitation:** Cannot be installed on extended channels. **Maximum:** One. **Field Installation:** Yes.

EXTENDED CHANNELS (#3850). Provides an additional group of five block multiplexer channels and one byte multiplexer channel. **Prerequisite:** #9145 on the 3027 Power and Coolant Distribution Unit ... see "Specify" under 3027. **Specify:** Color - #9160 for willow green, #9161 for garnet red, #9162 for sunrise yellow, #9163 for classic blue, #9164 for charcoal brown, #9165 for pebble gray, or #9166 for pearl white. **Maximum:** One. **Field Installation:** Yes.

TWO-BYTE INTERFACE (#7850). One is required on each channel attaching a 3838 Array Processor in two-byte mode or a 2305 Fixed Head Storage mdl 1. **Maximum:** One per channel group on the first block multiplexer channel of that group. **Prerequisite:** Second #7850 requires Extended Channels (#3850). **Field Installation:** Yes. **Specify:** #9201 for standard channel group, #9202 for extended channel group (#3850).

Special Feature Prices:		MLC 4 Yr	Purchase	MMMC	
Chnl-to-Chnl Adapter	#1850	\$410	\$375	\$15,000	\$10
Extended Channels	3850	9,900	9,000	360,000	525
Two-Byte Interface	7850	38	35	1,400	1



IBM 3033 PROCESSOR

Purpose: Provides arithmetic, logic, control functions, processor storage and channels for a 3033 Processor Complex. *A* and *M* models provide multiprocessing function.

Models		Bytes of Processor Storage
U4	M4 A4	4,194,304
U6†	M6†	6,291,456
U8	M8 A8	8,388,608
U12	M12 A12	12,582,192
U16	M16 A16	16,777,216

† Models U6 and M6 are no longer available.

Highlights: Depending upon the model, can contain up to 16,777,216 bytes of monolithic processor storage ... double-words are eight-way interleaved ... eight byte parallel data flow ... includes 65,536 bytes of 57 nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective access time of storage ... buffer storage does not increase the amount of addressable storage ... 57 nanosecond processor cycle ... overlapped operation of instruction and execution functions ... extensive data checking is coupled with increased availability and serviceability.

The A-series is basically identical to the M-series ... A or M designates whether the model is used in an AP or MP complex.

Improved instruction execution times over the 3168-3. Improved interrupt execution times over the 3168-3. Improved availability and serviceability through integrated channels.

Standard Features: Universal Instruction Set ... extended precision floating point ... one microsecond time-of-day clock with clock comparator ... one microsecond processor timer ... dynamic address translation ... extended control mode ... program event recording ... byte-oriented operand feature ... buffer storage (65,536 bytes) ... fetch and store protection ... direct control feature ... integrated channels ... S/370 Extended Facility ... storage configuration control ... reloadable control storage ... interval timer ... storage error checking and correction ... instruction retry ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... clear I/O.

In addition to the above, *A* and *M* models provide channel-set switching and four additional instructions: signal processor ... set prefix ... store prefix ... store CPU address.

Channels: Twelve integrated channels in two groups are standard. Each group consists of 1 byte multiplexer channel and 5 block multiplexer channels. Single channel block transfer rate of up to 1.5 million bytes/second is standard and up to 3 million bytes/second with the Two-Byte Interface (#7850) installed on the block multiplexer channel. 256 subchannels per channel, of which up to 8 subchannels/channel may be shared. Two optional channel-to-channel adapters per processor.

Prerequisites: Each 3033 requires one 3037 Power and Coolant Distribution Unit, one 3036 Console, and an appropriate 415 Hz power input. Customer-supplied chilled water is required for cooling the system. See *S/370 Installation Manual - Physical Planning, GC22-7004*.

The 3033 Attached Processor Complex requires a 3033 mdl A processor, a 3042 Attached Processor, a 3038 Multiprocessor Communication Unit, two (2) 3036 Consoles, and two (2) 3037 Power and Coolant Distribution Units [each equipped with Multiprocessing (#3050)].

A 3033 Multiprocessor Complex requires two 3033 mdl M processors, a 3038 Multiprocessor Communication Unit, two (2) 3036 Consoles, and two (2) 3037 Power and Coolant Distribution Units [each equipped with Multiprocessing (#5050)]. A 3033 Processor mdl M must be attached to a 3038 whether or not a second processor is in the complex.

Bibliography: GC20-0001

SPECIFY

- Voltage** (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
- Motor Generator Set and Starter:** If desired, see M 10000 pages for ordering instructions and prices.
- Unit Emergency Power Off:** See *S/370 Installation Manual - Physical Planning, GC22-7004* for details.
- Color:** #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.
- RETAIN/370:** The capability of using remote service/logout analysis facility is standard. Customer must provide interface for this facility to the telephone line if he desires the feature to be utilized.

Prices:	Mdl	MRC	MLC 4 Yr	Purchase	MMMM
3033	U4	\$70,020	\$63,660	\$3,070,000	\$7,200
	*U6	76,280	69,360	3,225,000	7,520
	U8	82,360	74,900	3,375,000	7,800
	U12	95,650	87,010	3,703,000	8,415
	U16	107,810	98,090	4,003,000	8,975
	M4	70,220	63,840	3,075,500	7,215
	*M6	76,480	69,540	3,230,500	7,535
	M8	82,560	75,080	3,380,500	7,815
	M12	95,850	87,190	3,708,500	8,430
	M16	108,010	98,270	4,008,500	8,990
	A4	70,220	63,840	3,075,500	7,215
	*A6	76,480	69,540	3,230,500	7,535
	A8	82,560	75,080	3,380,500	7,815
	A12	95,850	87,190	3,708,500	8,430
	A16	108,010	98,270	4,008,500	8,990

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3036) Machine Group: D
Per Call: 3 Purchase Option: 50% Warranty: A
Useful Life Category: 2 Termination Charge Months: 6
Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

* Models U6, M6 and A6 are not available.

Model Changes: Field Installable.

3033 TO 3033 MODEL CONVERSION PURCHASE PRICE

3033 Model U to 3033 Model A or M
(no change in storage size)\$5,500

3033 Model A to 3033 Model M
(no change in storage size)No Charge

3033 Model M to 3033 Model A
(no change in storage size)No Charge

3033 to 3033 MODEL UPGRADE PURCHASE PRICES

From To	U8	U12	U16
U4	\$305,000	\$633,000	\$933,000
U6	150,000	478,000	778,300
U8		328,000	628,000
U12			300,000

From To	M8	M12	M16
M4	\$305,000	\$633,000	\$933,000
M6	150,000	478,000	778,000
M8		328,000	628,000
M12			300,000

From To	A8	A12	A16
A4	\$305,000	\$633,000	\$933,000
A6	150,000	478,000	778,000
A8		328,000	628,000
A12			300,000

Notes:

- [1] There are no additional installation charges over the above model conversion and model upgrade prices.
- [2] The above model conversions and model upgrades are field installable.
- [3] Planning for Model Conversions and Model Upgrades: When a customer requires model (storage) upgrades in addition to a model conversion, the changes must not be consolidated into a single ... Also, model (storage) upgrades should be ordered individually in one-model increments.

[4] *Parts removed in upgrades from single density models (A4, A6, A8 ... U4, U6, U8 ... M4, M6, M8) to double density models (A12, A16 ... U12, U16 ... M12, M16) become the property of IBM and must be returned.*

SPECIAL FEATURES

CHANNEL-TO-CHANNEL ADAPTER (#1850 for first, #1851 for second). To interconnect two channels (either S/360, S/370, or 4341 Processor). Only one of the processors requires this feature. Uses one control unit position on each of the connected channels. Function can be expanded under program control so that the adapter will operate as a standard control unit. **Limitation:** Cannot be installed on extended channels. **Maximum:** Two, one #1850 and one #1851. **Field Installation:** Yes.

EXTENDED CHANNELS (#3850). Provides four additional block multiplexer channels, or three block multiplexer and one byte multiplexer channels. **Specify:** #9150 for four block multiplexer channels, or #9151 for three block multiplexer and one byte multiplexer channels. **Prerequisite:** #9145 on the 3037 Power and Coolant Distribution Unit ... see "Specify" under 3037. **Specify:** Color --



3033 Processor (cont'd)

#9160 for willow green, #9161 for garnet rose, #9162 for sunrise yellow, #9163 for classic blue, #9164 for charcoal brown, #9165 for pebble gray, or #9166 for pearl white. **Maximum:** One. **Field Installation:** Yes.

TWO-BYTE INTERFACE (#7850). One is required on each channel attaching a 3838 Array Processor in two-byte mode or a 2305 Fixed Head Storage mdl 1. **Prerequisite:** Third #7850 requires Extended Channels (#3850). **Maximum:** One per channel group. **Field Installation:** Yes. **Specify:** #9201 for first channel group, #9202 for second channel group, #9203 for extended channel group.

Special Feature Prices:	MLC			
	MRC	4 Yr	Purchase	MMMC
Channel-to-channel Adapter				
First	#1850	\$410	\$375	\$15,000
Second	1851	410	375	15,000
Extended Channels	3850	8,800	8,000	320,000
Two-Byte Interface	7850	38	35	1,400

IBM 3036 CONSOLE

Purpose: Provides the switches, lights, displays and control function for a 3031, 3032 or 3033 Processor, 3031 Attached Processor Complex, or a 3042 Attached Processor.

Highlights: One 3036 is used with each 3031, 3032 or 3033 Processor, or 3031 Attached Processor Complex. Two 3036s are used in a 3033 AP or MP Complex. Data can be entered into processor storage or into internal registers by means of the keyboard. Contents of storage or internal registers of the processor can be displayed.

Basic diagnostic tests of the processor complex, including processor, storage, channels and console can be operated from the console. Dual displays, individually addressable, with their associated input keyboards and control logic combine to provide a complete console I/O function. Either display may be used by the customer as an operator console or by the customer engineer as a service support console.

Also included are devices for loading the control store from a diskette drive, and a modem for the remote service facility. A systems activity monitor is provided for the 3032 and 3033 Processors and the 3042 Attached Processor.

PREREQUISITE: Requires two control unit positions and four device addresses on a channel, or preferably on two channels if a second channel group is installed [not on 3031]. A fifth device address is required if the remote service option is elected.

Bibliography: GC20-0001

SPECIFY

- **Voltage** (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
- **Cabling:** [For use with 3031 Processor only] #9080 for below floor, or #9081 for on floor.
- **Unit Emergency Power Off:** see S/370 Installation Manual - Physical Planning, GC22-7004 for details.
- **RETAIN/370:** May be used with a 3031, 3032 or 3033 Complex: However, it is not required. Remote Support Facility (RSF) is a customer option. When the option is selected, customer must provide the telephone lines required for the remote service facility modem. The customer must also arrange for the connection of the telephone interface cable provided by IBM to the telephone network.

PRICES: Mdl	MLC			
	MRC	4 Yr	Purchase	MMMC
3036 1	\$3,585	\$3,260	\$150,000	\$590

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Machine Group: D Per Call: 3 Purchase Option: 50%
Warranty: A Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

Metering: Base Unit (meters other units in Processor Complex) ... when attached to a 3042, the 3036 is an assignable unit and it meters the 3042 and its associated 3037.

IBM 3037 POWER AND COOLANT DISTRIBUTION UNIT

Purpose: Provides power and coolant distribution required by a 3033 Processor or 3042 Attached Processor.

Highlights: One 3037 is used with each 3033 Processor or 3042 Attached Processor ... two 3037s are used in a 3033 AP or MP Complex.

Bibliography: GC20-0001.

SPECIFY

- **Voltage** (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
- **Extended Channels:** #9145. Required if Extended Channels (#3850) is installed on the 3033.
- **Color:** #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.
- **Unit Emergency Power Off:** See S/370 Installation Manual - Physical Planning, GC22-7004 for details.

PRICES: Mdl	MLC			
	MRC	4 Yr	Purchase	MMMC
3037 1	\$3,825	\$3,480	\$160,000	\$210

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Machine Group: D Per Call: 3 Purchase Option: 50%
Warranty: B Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

Metering: Base Unit (meter on 3036) ... Assignable Unit when attached to a 3042.

SPECIAL FEATURES

MULTIPROCESSING (#5050). Provides functions for operation in a 3033 AP or MP complex ... required on each 3037 in a 3033 AP or MP complex. The 3037 must be attached to a 3033 A or M model, or a 3042. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MLC			
	MRC	4 Yr	Purchase	MMMC
Multiprocessing #5050	\$365	\$335	\$10,000	\$15

IBM 3038 MULTIPROCESSOR COMMUNICATION UNIT

Purpose: Control unit used in configuring a 3033 Attached Processor or Multiprocessor Complex. One is required for each complex.

Highlights: Contains hardware for communications between two processors. Permits either processor and any channel to address all processor storage.

Prerequisites ... Multiprocessing (#5050) on each 3037 in the complex, plus:

In a 3033 AP Complex -- a 3033 model A processor and a 3042 Attached Processor.

In a 3033 MP Complex -- one or two 3033 model M processors.

Bibliography: GC20-0001

SPECIFY

- **Voltage** (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
- **Color:** #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.

PRICES: Mdl	MLC			
	MRC	4 Yr	Purchase	MMMC
3038 1	\$13,530	\$12,300	\$369,000	\$340

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Machine Group: D Per Call: 3 Purchase Option: 50%
Warranty: A Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

Metering: Base Unit (in a 3033 AP Complex -- meter on 3036 Console of 3033 mdl A ... in a 3033 MP Complex -- meter on 3036 of first 3033 mdl M installed.)

IBM 3041 ATTACHED PROCESSOR

IBM 3042 ATTACHED PROCESSOR

Purpose: Provides Instruction/Execution Function, Buffer Control Function, and communication logic for a 3031 Attached Processor Complex.

Highlights

Can access up to 6 megabytes of monolithic processor storage on the host 3031 Processor A model ... 115 nanosecond processor cycle ... includes 32K bytes of high speed buffer storage ... Instruction/Execution Function similar to that of the 3031 Processor ... Buffer Control Function similar to that of the 3031 ... controlled by reloadable control storage.

Standard features include: Universal Instruction Set ... interval timer ... store and fetch protect ... byte oriented operand feature ... instruction retry ... dynamic address translation .. extended control mode ... program event recording ... time-of-day clock with clock comparator ... CPU timer ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... Extended Precision Floating Point ... Virtual Machine Assist (VMA) and OS/VS1 Extended Control Program Support (ECPS) when operating under VM/370 ... S/370 Extended Facility.

Prerequisites: The 3041 requires a 3031 Processor A model and a second 3017 Power Unit.

Bibliography: GC20-0001

SPECIFY

- **Voltage** (AC, 3-phase, 4-wire, 60 Hz): **#9903** for 208 V, or **#9905** for 230 V.
- **Color:** **#9060** for willow green, **#9061** for garnet rose, **#9062** for sunrise yellow, **#9063** for classic blue, **#9064** for charcoal brown, **#9065** for pebble gray, or **#9066** for pearl white.

Prices:	Mdl	MRC	MLC 4 Yr	Purchase	MMMC	
	3041	1	\$12,820	\$11,660	\$335,000	\$900

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Assignable Unit Maintenance: D
 Per Call: 3 Purchase Option: 55% Warranty: A
 Useful Life Category: 2 Termination Charge Months: 6
 Termination Charge Percent: 25% Upper Limit Percent: 5%
 Model/Feature Additional Charge in lieu of AU Charge: 15%

SPECIAL FEATURES

DIRECT CONTROL (#3274). Provides two instructions, "Read Direct" and "Write Direct", and six distinct external interrupt lines which are independent of data and channel operations. The read and write instructions provide timing signals and transfer a single byte between two cable-connected processing units, or a cable-connected processing unit and external devices. The read and write instructions must use real addresses only. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in S/370 - Direct Control Feature - OEMI, GA22-6845.

Special Feature Prices:	MRC	MLC 4 Yr	Purchase	MMMC	
Direct Control	#3274	\$104	\$ 95	\$3,700	\$ 1.50

Purpose: Provides arithmetic, logic, and control functions in a 3033 Attached Processor Complex.

Highlights: Can access up to 16,777,216 bytes of processor storage on the host 3033 Model A processor ... double-words are eight-way interleaved ... eight byte parallel data flow ... includes 65,536 bytes of 57 nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective access time of storage ... buffer storage does not increase the amount of addressable storage ... 57 nanosecond processor cycle ... overlapped operation of instruction and execution functions ... extensive data checking.

Standard Features: Universal Instruction Set ... extended precision floating point ... one microsecond time-of-day clock with clock comparator ... one microsecond processor timer ... dynamic address translation ... extended control mode ... program event recording ... byte-oriented operand feature ... buffer storage (65,536 bytes) ... fetch and store protection ... direct control feature ... S/370 Extended Facility ... reloadable control storage ... interval timer ... instruction retry ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... channel-set switching and four instructions: signal processor ... set prefix ... store prefix ... store CPU address.

Prerequisites: The 3033 Attached Processor Complex requires a 3042 Attached Processor, a 3033 Model A processor, a 3038 Multiprocessor Communication Unit, two (2) 3036 Consoles, two (2) 3037 Power and Coolant Distribution Units [each with Multiprocessing (#5050)], and an approximate 415 Hz power input. Customer-supplied chilled water is required for cooling the system. See S/370 Installation Manual - Physical Planning, GC22-7004.

Bibliography: GC20-0001

SPECIFY

- **Voltage** (AC, 3-phase, 4-wire, 60 Hz): **#9903** for 208 V, or **#9905** for 230 V.
- **Motor Generator Set and Starter:** If desired, see M 10000 pages for ordering instructions and prices.
- **Unit Emergency Power Off:** See S/370 Installation Manual - Physical Planning, GC22-7004 for details.
- **Color:** **#9060** for willow green, **#9061** for garnet rose, **#9062** for sunrise yellow, **#9063** for classic blue, **#9064** for charcoal brown, **#9065** for pebble gray, or **#9066** for pearl white.
- **RETAIN/370:** The capability of using remote support/logout analysis facility is standard. Customer must provide interface for this facility to the telephone line if he desires to utilize this feature.

Prices:	Mdl	MRC	MLC 4 Yr	Purchase	MMMC	
	3042	1	\$39,400	\$35,820	\$895,500	\$2,750

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Maintenance: D Per Call: 3 Warranty: A
 Purchase Option: 50% Useful Life Category: 2
 Termination Charge Months: 6 Termination Charge Percent: 25%
 Metering: Assignable Unit (meter on attached 3036)
 Model/Feature Additional Charge in lieu of AU Charge: 15%
 Upper Limit Percent: 5%



IBM 3046 POWER UNIT

Purpose: Provides power for a 3135, 3135-3 or 3138 Processing Unit, or for a 3345 Storage and Control mdl 1, 2, 4 or 5 with a 3145 Processing Unit mdl HG or I.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Cabling: #9080 for below the floor; #9081 for on the floor.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Year	Purchase	MMMC
	3046	1	\$356 \$324	\$10,860	\$ 30

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3135, 3138 or 3145)
Machine Group: A Per Call: 3 Purchase Option: 45%†
Warranty: B Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

IBM 3047 POWER UNIT

Purpose: Provides power for a 3145 Processing Unit mdl H2, HG2, I2, IH2, J2, JI2 or K2, or 3145-3, 3148 Processing Unit.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Cabling: #9080 for below the floor, or #9081 for on the floor.

[4] Field Conversion of a 3145 mdl FED, GE, GFD, H, HG or I to a mdl H2, HG2, I2, IH2, J2, JI2 or K2, requires a 3047 mdl 2. Conversion from a mdl FED, GE, GFD, H, HG or I to a mdl JI2 or K2 will be made via RPQ.

Prices:	Mdl	MAC/ MRC	TLP/ MLC 4 Year	Purchase	MMMC
	3047	1	\$378 \$344	\$11,550	\$ 29

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3145 or 3148) Machine Group: A
Per Call: 3 Purchase Option: 45%†
Warranty: B Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

3052 ATTACHED PROCESSING UNIT

Purpose: Provides arithmetic, logic, control and communication function for an Attached Processor System.

Highlights: Can access up to 6,291,456 bytes of monolithic processor storage on the host 3158 or 3158-3 ... 115 nanosecond processor cycle ... includes 16,384 bytes of buffer storage which is transparent to the programmer and reduces the effective cycle time accessing the host storage. Sixteen general purpose and four floating point registers are implemented in high speed internal circuits with a four byte data flow. The APU functions are controlled by reloadable control storage.

Standard features include: Universal instruction set ... interval timer ... store and fetch protect ... byte oriented operand feature ... instruction retry ... dynamic address translation ... extended control mode ... program event recording ... time-of-day clock with clock comparator ... CPU timer ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address.

PREREQUISITES: The 3052 Attached Processor Unit mdl 1 requires (1) A 3158 or 3158-3 A series processing unit ... (2) A 3056 Remote System Console.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Cabling: #9080 for below floor, or #9081 for on floor.

[4] If two processors are installed and the 3052 is additional and emergency power off ability is required on the systems, then the expanded Emergency Power Off Control (#3622) should be ordered for the host processor.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Year	Purchase	MMMC
	3052	1	\$12,670 \$11,520	\$380,000	\$2,200

Plan Offering: A, Additional Use Charge Rate: 10%
Metering: Assignable Unit Machine Group: D
Per Call: 3 Purchase Option: 55%† Warranty: A
Useful Life Category: 2 Termination Charge Months: 6
Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

SPECIAL FEATURES

DIRECT CONTROL (#3274). Provides two instructions, "Read Direct" and "Write Direct", and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte between two cable-connected processing units, or a cable-connected processing unit and external devices. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in S/370 - Direct Control Feature - OEMI, GA22-6845.

EXTENDED PRECISION FLOATING POINT (#3700). Provides instructions to handle extended precision (28-hexadecimal digit fraction) floating point operands. Extended precision operands may also be rounded to long-precision format, which in turn may be rounded to short-precision format. **Field Installation:** Yes.

1401/1440/1460, 1410/7010 COMPATIBILITY (#3950). Provides the system with the ability to execute 1401/1440/1460 and 1410/7010 instructions under specific conditions of minimum and matching configurations ... see P 360N pages for DOS and P 360C pages for OS. **Field Installation:** Yes. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730).

OS/DOS COMPATIBILITY (#5450). Provides the system with the ability to execute DOS programs under specific conditions ... see P 360C pages in "Programming." **Field Installation:** Yes. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730).

PROCESSOR ATTACH (#5552). Provides additional storage protect capability required when the APU is attached to a model A-Series processing unit whose storage size is over one megabyte. One feature is required for each megabyte of storage in the A-Series processor above one megabyte, e.g.

† Purchase Option is 50% under Term Lease Plan (TLP)



3052 Attached Processing Unit (cont'd)

Processor Model	No. of Processor Attach Feature
AP3 or AP4, A33 or A34	1
AP5, A35	2
AP6, A36	3
AP7, A37	4
AP8, A38	5

Maximum: Five. Field Installation: Yes.

SYSTEM/370 EXTENDED (#7730). Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. **Field Installation:** Yes. **Prerequisites:** System/370 Extended (#7730) and System/370 Extended, Add'l (#7731) on the A-series processor. **Limitation:** This function cannot be loaded, at IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#3950), OS/DOS Compatibility (#5450), or 7070/7074 Compatibility (#7117).

7070/7074 COMPATIBILITY (#7117). Provides the system with the ability to execute 7070/7074 instructions under specific conditions ... see P 360C pages in "Programming." **Field Installation:** Yes. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730).

VIRTUAL MACHINE ASSIST (#8740). Provides assist to VS operating systems operating under VM/370 by emulation of certain privileged operations. **Field Installation:** Yes.

Special Feature Prices:	Mdl	TLP/		Purchase	MMMC
		MAC/MRC	MLC 4 Yr		
Direct Control	#3274	\$123	\$112	\$3,705	\$ 4
Extnd Prec Fltng Pt	3700	NC	NC	NC	NC
1401/1440/1460, 1410/7010 Compatibility	3950	NC	NC	NC	NC
OS/DOS Compatibility	5450	NC	NC	NC	NC
Processor Attach	5552	90	82	2,700	15
7070/7074 Compatibility	7117	NC	NC	NC	NC
System/370 Extended	7730	935	850	17,000	6
Virtual Machine Assist	8740	NC	NC	NC	NC

IBM 3056 REMOTE SYSTEM CONSOLE

Purpose: Provides an additional keyboard and cathode ray tube for remote operation of a S/370 mdl 158 or is used as a diagnostic console for the 3052 Attached Processing Unit.

Highlights: Permits remote system operation up to 200 feet from the 3158 or 3158-3, including the ability to communicate with the operating system via PROGRAM frame, IPL via MANUAL frame, system debug via ALTER/DISPLAY frame, and display hardware status via maintenance frames. The unit has no light pen. Also, acts as a diagnostic console for a 3052 Attached Processing Unit (APU), permitting most APU maintenance functions to be performed while the A-Series Processing Unit continues operation in uniprocessor mode. A 3056 attached to a 3052 is required as part of a S/370 mdl 158 Attached Processor System. When attached to a 3052, the 3056 may not be used as a remote console. A 3056 attached to a 3158 or 3158-3 for remote system operation may not be used as a diagnostic console for the 3052. If both modes of operation are required for a S/370 mdl 158 AP System, two 3056s should be ordered.

PREREQUISITE: 3056 Remote Console Attachment (#7820) on the 3158 or 3158-3. Not required when the 3056 is attached to a 3052.

Field Installation: Yes.

Limitations: (1) One per 3158 or 3158-3 ... (2) One per 3052 ... when attached to a 3052, the maximum distance between the 3056 and the 3052 is twenty feet.

Bibliography: GC20-0001

PRICES:	Mdl	TLP/		Purchase	MMMC
		MAC/MRC	MLC 4 Yr		
3056	1	\$ 545	\$ 496	\$20,800	\$ 10

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3158, 3158-3 or 3052)
Machine Group: D Per Call: 3 Purchase Option: 55%†
Warranty: B Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

IBM 3058 MULTISYSTEM UNIT

Purpose: Control unit used in configuring a S/370 mdl 158 Multiprocessor System. One is required for each system containing one or two 3158/3158-3 multiprocessor models.

Highlights: Permits two 3158/3158-3 multiprocessing units to be interconnected to form a multiprocessing system. Contains configuration control facilities for mode of operation (MP/UP), storage address assignment, and attachment of I/O control units having the remote switch attachment feature.

PREREQUISITES: One or two 3158 multiprocessing models ... I/O control units which are to be connected to the I/O assignment switches on the configuration control panel must have the two channel switch feature and the remote switch attachment feature.

Field Installation: Yes.

Bibliography: GC20-0001

SPECIFY: [1] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[2] Processor Models: Must be specified.

Symmetrical Processors		Feature
MP1 or M31		#9501
MP2 or M32		9502
MP3 or M33		9503
MP4 or M34		9504
MP5 or M35		9505
MP6 or M36		9506

Asymmetric Processors			
Left Processor	Feature	Right Processor	Feature
M32	#9181	M32	#9182
M34	9183	M34	9184
M35	9185	M35	9186
M36	9187	M36	9188
M37	9189	M37	9190
M38	9191	M38	9192

PRICES:	Mdl	TLP/		Purchase	MMMC
		MAC/MRC	MLC 4 Yr		
3058	1	\$1,370	\$1,250	\$46,990	\$21.50

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 1st 3158 mdl MP or M3 installed)
Maintenance: C Per Call: 3 Purchase Option: 55%†
Warranty: A Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

SPECIAL FEATURES

I/O ASSIGNMENT SWITCH EXPANSION (#4600). Adds an additional 14 assignment switches to the basic 14 on the configuration panel of the 3058. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	Mdl	TLP/		Purchase	MMMC
		MAC/MRC	MLC 4 yr		
I/O Assign Sw Expan	#4600	\$112	\$102	\$5,495	\$ 1

† Purchase Option is 50% under Term Lease Plan (TLP)



DP Machines

M 3060 - 3062
May 79

IBM 3060 SYSTEM CONSOLE [No Longer Available]

Purpose: Provides the switches and lights necessary to operate the S/360 mdl 195 or S/370 mdl 195.

Highlights: One unit is used with each 3195 Processing Unit. Data can be entered into processor storage or into internal registers by keys and switches. Contents of storage or internal registers of the mdl 195 can be displayed. Basic maintenance tests of the processor, including storage, can be operated from the console. A display console is included which is functionally equivalent to a 2250 mdl 1 with the following features: Alphameric keyboard, 8K buffer (4K is maintenance only), character generator, light pen, and OCP-First. The display console and Operator Console Panel which are included may be used as an operator's console.

PREREQUISITE: A control unit position on a 2860, 2870 with Selector Subchannel (special feature), or a non-shared subchannel of a 2880.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

SPECIAL FEATURES

The following special feature is on an "as available" basis for field installation.

OPERATOR CONTROL PANEL - SECOND (#5476). Provides a duplicate of the on/off and program load facilities (OCP) of a second processing unit. **Maximum:** One.

IBM 3062 ATTACHED PROCESSING UNIT

Purpose: Provides arithmetic, logic, control, and communication function for an Attached Processor System.

Highlights: Can access up to 8,388,608 bytes of monolithic processor storage on the host 3168-3 ... eight byte parallel data flow ... includes up to 32,768 bytes of 80 nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective cycle time of storage ... buffer storage does not increase the amount of addressable storage ... 80 nanosecond processor cycle ... double-words are four-way interleaved ... overlapped operation of instruction and execution units ... extensive data checking is coupled with 3168-3 reliability, availability and serviceability. Improved availability and serviceability through a service processor.

Standard Features: Universal instruction set ... extended precision ... one-microsecond time-of-day clock with clock comparator ... one-microsecond CPU timer ... dynamic address translation ... extended control mode ... program event recording ... additional variable field length instructions ... control registers, expanding the functions of PSWs ... byte oriented operand feature ... buffer storage (32,768 bytes) ... fetch and store protection ... writeable control storage ... interval timer ... storage error checking and correction ... instruction retry ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... store CPU ID, additional instructions on the APU signal processor ... set prefix store prefix ... store CPU address.

PREREQUISITES: The 3062 APU mdl 1 requires: [1] A 3168 model A series processor ... [2] A 3066 System Console mdl 3 (shared with 3168-3) ... [3] A 3067 mdl 5 for the APU ... [4] A 3062 Mdl 1 Attached Processing Unit Support (#7901) on the CPU 3067 mdl 3 ... [5] *An appropriate 415Hz power input.* Customer-supplied chilled water is required for cooling the system. See S/370 Installation Manual - Physical Planning, GC22-7004 ... [6] *Special features on the 3062 must match those on the 3168 for a normal installation. When special features do not match, RPQ must be ordered for the 3168.*

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Motor Generator Set and Starter *if desired:* See M 10000 pages for ordering instructions and prices.

[4] *If two processors are installed and the 3062 is added and emergency power off ability is required on the systems, then the expanded Emergency Power Off Control (#3624) should be ordered for the host processor.*

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
	3062	1	\$53,000	\$48,190	\$1,078,000 \$5,100

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: *Non-assignable (runs with Processor)* Machine Group: D
Per Call: 3 Purchase Option: 55%† Warranty: A
Useful Life Category: 1 Termination Charge Months: 6
Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

SPECIAL FEATURES

HIGH SPEED MULTIPLY (4525). Improves AU speed in both fixed and floating point multiply operations. **Field Installation:** Not recommended. **Prerequisites:** High Speed Multiply (#4525) on the 3066 System Console mdl 3 and on the 3067 Power and Coolant Distribution Unit mdl 5.

SYSTEM/370 EXTENDED (#7730). Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. **Field Installation:** Yes. **Prerequisites:** System/370 Extended (#7730) on the A-series processor or on a 3168 with RPQs (Performance Improvements) and (APU Attach).

Special Feature Prices:		MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
High Speed Multiply	#4525	\$3,035	\$2,760	\$145,950	\$131
System/370 Extended	7730	3,575	3,250	65,000	50

† Purchase Option is 50% under Term Lease Plan (TLP)

IBM 3066 SYSTEM CONSOLE - MODEL 1

[The 3066 model 1 is no longer available ... features and model changes can be ordered on an "as available" basis.]

Purpose: Provides the switches, lights, display and control functions for a S/370 mdl 165.

Highlights: One 3066 mdl 1 is used with each 3165 Processing Unit. Data can be entered into processor storage or into internal registers by keys and switches. Contents of storage or internal registers of the system can be displayed.

Basic maintenance tests of the processor, including storage, can be operated from the console. A display console with a 4K buffer, an input keyboard, and associated control logic combine to provide a complete console I/O function. In normal mode, the CRT and the alphameric keyboard are designed to be used as the operator's console.

Also included is a microfiche projection display, a microfiche document viewer, a main storage configuration plugboard, a systems activity monitor, and a device for inputting microcode from a magnetic disk cartridge to the writable control storage.

PREREQUISITE: A control unit position on a 2860 Selector Channel, 2870 Basic Multiplexer Channel, 2870 Selector Subchannel (special feature), or a non-shared subchannel of a 2880 Block Multiplexer Channel ... see 2860, 2870, 2880.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
3066	1	\$3,825	\$128,150	\$552

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meters 3165, 3067 mdl 1) Machine Group: D
Per Call: 3 Purchase Option: 55% Warranty: A
Useful Life Category: 1

Note: The 3066 mdl 1 can be field upgraded to a 3066 mdl 2 or 3.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges.)

Model 1 to Model 2 \$ 4,165
Model 1 to Model 3 \$ 8,715

SPECIAL FEATURES

HIGH SPEED MULTIPLY (#4520). Required if feature #4520 is installed on the 3165 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** High Speed Multiply (#4520) on the 3165 and on the 3067 Power and Coolant Distribution Unit mdl 1.

7070/7074 COMPATIBILITY (#7117). Required if feature #7117 is installed on the 3165 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 7070/7074 Compatibility (#7117) on the 3165 and on the 3067 Power and Coolant Distribution Unit mdl 1.

7080 COMPATIBILITY (#7118). Required if feature #7118 is installed on the 3165 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 7080 Compatibility (#7118) on the 3165 and on the 3067 Power and Coolant Distribution Unit mdl 1.

709/7090/7094/7094 II COMPATIBILITY (#7119). Required if feature #7119 is installed on the 3165 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 709/7090/7094/7094 II Compatibility (#7119) on the 3165 and on the 3067 Power and Coolant Distribution Unit mdl 1.

Special Feature Prices:	MAC/MRC	Purchase	MMMC
High Speed Multiply	#4520 \$ 10	\$ 589	NC
7070/7074 Compatibility	7117 5	262	NC
7080 Compatibility	7118 5	262	NC
709/7090/7094/7094 II Compatibility	7119 5	262	NC

IBM 3066 SYSTEM CONSOLE - MODEL 2 AND 3

Purpose: Provides the switches, lights, display and control functions for a S/370 mdl 168.

Highlights: One 3066 mdl 2 is used with each 3168/3168-3 Processing Unit. Data can be entered into processor storage or internal registers by keys and switches. Contents of storage or internal registers of the 3168/3168-3 can be displayed.

Basic maintenance tests of the processor, including storage, can be operated from the console. A display console with a 4K buffer, an input keyboard, and associated control logic combine to provide a complete console I/O function. In normal mode, the CRT and the alphameric keyboard are designed to be used as the operator's console.

Also included is a microfiche projection display, a microfiche document viewer, a main storage configuration plugboard, a systems activity monitor, and a device for inputting microcode from a magnetic disk cartridge to the writable control storage.

A 3066 mdl 3 is used with each 3168-3 A series to support a 3062-1 APU.

PREREQUISITE: A control unit position on a 2860 Selector Channel, 2870 Basic Multiplexer Channel, 2870 Selector Subchannel (special feature), or a non-shared subchannel of a 2880 Block Multiplexer Channel ... see 2860, 2870, 2880.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] 3168-3 Attachment: #9650 ... req'd to attach a 3168-3 Processing Unit.

PRICES:	Mdl	MAC/MRC	TLP/MLC 4 Yr	Purchase	MMMC
3066	2	\$3,825	\$3,480	\$128,150	\$552
	3	3,960	3,600	132,700	562

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meters 3168[any mdl], 3067 mdl 2, 3)
Per Call: 3 Purchase Option: 55%† Warranty: A
Useful Life Category: 1 Termination Charge Months: 6
Termination Charge Percent: 25% Machine Group: D
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges.)

Model 2 to Model 3 \$4,550

SPECIAL FEATURES

HIGH SPEED MULTIPLY (#4525). Required if feature #4525 is installed on the 3168/3168-3 Processing Unit. **Field Installation:** Yes. **Prerequisite:** High Speed Multiply (#4525) on the 3168/3168-3 and on the 3067 Power and Coolant Distribution Unit mdl 2, 3 or 5.

MULTIPROCESSING (#5050). Required if the 3066 mdl 2 is used with a 3168 or 3168-3 multiprocessor model. **Field Installation:** Yes.

POWER WARNING (#5760). Provides signal to the 3168/3168-3 system when power is outside specified limits. **Prerequisites:** All models require customer supplied uninterruptible power supply with line sensor. Multiprocessing models also require special cable ... consult physical planning representative. **Field Installation:** Yes.

7070/7074 COMPATIBILITY (#7127). Required if feature #7127 is installed on the 3168/3168-3 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 7070/7074 Compatibility (#7127) on the 3168/3168-3 and on the 3067 Power and Coolant Distribution Unit mdl 2 or 3.

7080 COMPATIBILITY (#7128). Required if feature #7128 is installed on the 3168/3168-3 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 7080 Compatibility (#7128) on the 3168/3168-3 and on the 3067 Power and Coolant Distribution Unit mdl 2 or 3.

709/7090/7094/7094 II COMPATIBILITY (#7129). Required if feature #7129 is installed on the 3168/3168-3 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 709/7090/7094/7094 II Compatibility (#7129) on the 3168/3168-3 and on the 3067 Power and Coolant Distribution Unit mdl 2 or 3.

Special Feature Prices:	MAC/MRC	TLP/MLC 4 Yr	Purchase	MMMC
High Speed Multiply	#4525 \$ 10	\$ 10	\$ 589	NC
Multiprocessing	5050 90	82	4,475	\$ 1
Power Warning	5760 142	130	5,725	1
7070/7074 Compatibility	7127 5	5	262	NC
7080 Compatibility	7128 5	5	262	NC
709/7090/7094/7094 II Compatibility	7129 5	5	262	NC

† Purchase Option is 50% under Term Lease Plan (TLP)

3067 POWER and COOLANT DISTRIBUTION UNIT - MODEL 1

[The 3067 model 1 is no longer available .. features and model changes can be ordered on an "as available" basis.]

Purpose: Provides power and coolant distribution control required by a S/370 mdl 165.

Highlights: One 3067 mdl 1 is used with each 3165 Processing Unit.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9042 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Channel Frames: The number of channel frames specified on the power distribution unit must be equal or greater than the channel frames actually attached. Required for channel frame attachment are the following:

- #9132 - for 2nd channel frame
- #9133 - for 3rd channel frame ... #9132 required
- #9134 - for 4th channel frame ... #9133 required
- #9135 - for 5th channel frame ... #9134 required
- #9136 - for 6th channel frame ... #9135 required
- #9137 - for 7th channel frame ... #9136 required

NOTE: Customers who may elect to purchase and have present or future requirements for seven channel frames should order #9132 thru #9137.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
3067	1	\$ 2,825	\$95,130	\$131

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3066 mdl 1)
Maintenance: A Per Call: 3 Purchase Option: 55%
Useful Life Category: 1 Warranty: B

Note: The 3067 mdl 1 can be field upgraded to a 3067 mdl 2.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model 1 to Model 2\$ 3,040

SPECIAL FEATURES

BUFFER EXPANSION (#1432). Required if feature #1432 is installed on the 3165 Processing Unit. **Field Installation:** Yes. **Prerequisite:** Buffer Expansion (#1432) on the 3165.

HIGH SPEED MULTIPLY (#4520). Required if feature #4520 is installed on the 3165 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** High Speed Multiply (#4520) on the 3165 and on the 3066 System Console mdl 1.

7070/7074 COMPATIBILITY (#7117). Required if feature #7117 is installed on the 3165 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 7070/7074 Compatibility (#7117) on the 3165 and on the 3066 System Console mdl 1.

7080 COMPATIBILITY (#7118). Required if feature #7118 is installed on the 3165 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 7080 Compatibility (#7118) on the 3165 and on the 3066 System Console mdl 1.

709/7090/7094/7094 II COMPATIBILITY (#7119). Required if feature #7119 is installed on the 3165 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 709/7090/7094/7094 II (#7119) on the 3165 and on the 3066 System Console mdl 1.

Special Feature Prices:		MAC/ MRC	Purchase	MMMC
Buffer Expansion	#1432	\$114	\$ 5,630	\$ 5.00
High Speed Multiply	4520	148	7,105	5.00
7070/7074 Compatibility	7117	422	20,440	35.50
7080 Compatibility	7118	422	20,440	35.50
709/7090/7094/7094 II Compatibility	7119	422	20,440	35.50

† Purchase Option is 50% under Term Lease Plan (TLP)

3067 POWER and COOLANT DISTRIBUTION UNIT - MODEL 2

Purpose: Provides power and coolant distribution control required by a S/370 mdl 168.

Highlights: One 3067 mdl 2 is used with each 3168 Processing Unit.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
3067	2	\$2,825	\$2,570	\$95,130	\$131

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3066 mdl 2) Maintenance: A
Per Call: 3 Purchase Option: 55%† Warranty: B
Useful Life Category: 1
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

Model Changes: Model 2 can be changed to Model 3 in the field.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 2 to Model 3 \$1,230

SPECIAL FEATURES

BUFFER EXPANSION (#1435). Required if feature #1435 is installed on the 3168 Processing Unit. **Field Installation:** Yes. **Prerequisite:** Buffer Expansion (#1435) on the 3168.

HIGH SPEED MULTIPLY (#4525). Required if feature #4525 is installed on the 3168 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** High Speed Multiply (#4525) on the 3168 and on the 3066 System Console mdl 2.

Multiprocessing (#5050). Required if the 3067 is used with a 3168 mdl MP. **Field Installation:** Yes.

7070/7074 COMPATIBILITY (#7127). Required if feature #7127 is installed on the 3168 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 7070/7074 Compatibility (#7127) on the 3168 and on the 3066 System Console mdl 2.

7080 COMPATIBILITY (#7128). Required if feature #7128 is installed on the 3168 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 7080 Compatibility (#7128) on the 3168 and on the 3066 System Console mdl 2.

709/7090/7094/7094 II COMPATIBILITY (#7129). Required if feature #7129 is installed on the 3168 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 709/7090/7094/7094 II Compatibility (#7129) on the 3168 and on the 3066 System Console mdl 2.

Special Feature Prices:		MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
Buffer Expansion	#1435	\$114	\$104	\$ 5,630	\$ 5.00
High Speed Multiply	4525	148	135	7,105	5.00
Multiprocessing	5050	342	311	16,720	23.00
7070/7074 Compatibility	7127	422	384	20,440	35.50
7080 Compatibility	7128	422	384	20,440	35.50
709/7090/7094/7094 II Compatibility	7129	422	384	20,440	35.50



DP Machines

3067 POWER and COOLANT DISTRIBUTION UNIT - MODEL 3

M 3067 - 3068
May 79

Purpose: Provides power and coolant distribution control required by a S/370 mdl 168.

Highlights: One 3067 mdl 3 is used with each 3168-3 Processing Unit.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
	3067	3	999 \$2,875	\$2,615	\$96,360 \$132

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Base Unit (meter on 3066 mdl 2) Maintenance: A
 Per Call: 3 Purchase Option: 55%† Warranty: B
 Useful Life Category: 1 Termination Charge Months: 6
 Termination Charge Percent: 25%
 Model/Feature Additional Charge in lieu of AU Charge: 15%
 Upper Limit Percent: 5%

SPECIAL FEATURES

HIGH SPEED MULTIPLY (#4525). Required if feature #4525 is installed on the 3168-3 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** High Speed Multiply (#4525) on the 3168-3 and on the 3066 System Console mdl 2.

MULTIPROCESSING (#5050). Required if the 3067 is used with a 3168-3 multiprocessing model. **Field Installation:** Yes.

7070/7074 COMPATIBILITY (#7127). Required if feature #7127 is installed on the 3168-3 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 7070/7074 Compatibility (#7127) on the 3168-3 and on the 3066 System Console mdl 2.

7080 COMPATIBILITY (#7128). Required if feature #7128 is installed on the 3168-3 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 7080 Compatibility (#7128) on the 3168-3 and on the 3066 System Console mdl 2.

709/7090/7094/7094 II COMPATIBILITY (#7129). Required if feature #7129 is installed on the 3168-3 Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** 709/7090/7094/7094 II Compatibility (#7129) on the 3168-3 and on the 3066 System Console mdl 2.

3062 ATTACHED PROCESSING UNIT MDL 1 SUPPORT (#7901). Required if a 3062 APU mdl 1 is attached to the 3168. **Field Installation:** Yes. **Corequisite:** 3062 APU mdl 1.

Special Feature Prices:		MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
High Speed Multiply	#4525	\$148	\$135	\$ 7,105	\$ 5.00
Multiprocessing	5050	342	311	16,720	23.00
7070/7074 Compatibility	7127	422	384	20,440	35.50
7080 Compatibility	7128	422	384	20,440	35.50
709/7090/7094/7094 II Compatibility	7129	422	384	20,440	35.50
3062 APU Support	7901	50	46	2,500	5.00

3067 POWER AND COOLANT DISTRIBUTION UNIT - MODEL 5

Purpose: Provides power and coolant distribution control required by a 3062 Attached Processing Unit mdl 1.

Highlights: One 3067 mdl 5 is used with the 3062 Attached Processing Unit mdl 1.

PREREQUISITE: A 3062 Attached Processing Unit mdl 1.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

† Purchase Option is 50% under Term Lease Plan (TLP)

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
	3067	5	\$2,825	\$2,570	\$95,130 \$131

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Base Unit (meter on 3066 mdl 3) Maintenance: A
 Per Call: 3 Purchase Option: 55%† Warranty: B
 Useful Life Category: 1 Termination Charge Months: 6
 Termination Charge Percent: 25%
 Model/Feature Additional Charge in lieu of AU Charge: 15%
 Upper Limit Percent: 5%

SPECIAL FEATURES

HIGH SPEED MULTIPLY (#4525). Required if feature #4525 is installed on the 3062 Attached Processing Unit. **Field Installation:** Not recommended. **Prerequisite:** High Speed Multiply (#4525) on the 3062 Attached Processing Unit and on the 3066 System Console mdl 3.

Special Feature Prices:		MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
High Speed Multiply	#4525	\$148	\$135	\$7,105	\$5

3068 MULTISYSTEM COMMUNICATION UNIT

Purpose: Control unit used in configuring a S/370 mdl 168 Multiprocessor System. One is required for each system containing one or two 3168/3168-3 multiprocessor models.

Highlights: Contains hardware for communications between two S/370 mdl 168 multiprocessing processors together with configuration control facilities for mode of operation (MP/UP), storage address assignment, and attachment of I/O control units having the remote switch attachment feature.

PREREQUISITES: One or two 3168/3168-3 multiprocessor models ... I/O control units which are to be connected to the I/O assignment switches on the configuration control panel must have the two channel switch feature and the remote switch attachment feature. *If the 3068 is to be installed with only one of the 3168/3168-3 multiprocessors models, order additional end cover via RPQ*

Field Installation: Yes.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
	3068	1	\$14,590	\$13,270	\$500,800 \$387

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Base Unit Maintenance: A Per Call: 3
 Purchase Option: 55%† Warranty: A Useful Life Category: 1
 Termination Charge Months: 6 Termination Charge Percent: 25%
 Model/Feature Additional Charge in lieu of AU Charge: 15%
 Upper Limit Percent: 5%

SPECIAL FEATURES

EXTENDED STORAGE ATTACHMENT (#3850), Provides for attachment of Extended Storage Control (†4MB) if either processor is a model MP5, MP6, MP7, MP8, M35, M36, M37 or M38. **Maximum:** One. **Field Installation:** Yes.

I/O ASSIGNMENT SWITCH EXPANSION (#4600). Adds an additional 14 assignment switches to the basic 14 on the configuration panel of the 3068. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:		MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
Extended Storage Attach	#3850	\$140	\$128	\$6,875	NC
I/O Assign Sw Expansn	4600	112	102	5,495	\$ 1



DP Machines
3080 POWER UNIT
[No Longer Available]

M 3080 - 3086
May 79

Purpose: Provides power for the S/360 mdl 195 or S/370 mdl 195.

Highlights: One unit of each model of the 3080 is used with each 3195 Processing Unit. Model 1 provides power for the Floating Point Execution Element ... Model 2 provides power for the Fixed Point and Variable Field Length Execution Element ... Model 3 provides power for the Instruction Processor and the Storage Control Unit.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

3085 POWER DISTRIBUTION UNIT
[No Longer Available]

Purpose: Provides power control and distribution for a S/360 mdl 195 or S/370 mdl 195.

Highlights: One unit is used with each 3195 Processing Unit.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

3086 COOLANT DISTRIBUTION UNIT
[No Longer Available]

Purpose: Provides distribution control for coolant required by the S/360 mdl 195 or S/370 mdl 195.

Highlights: One unit is used with each 3195 Processing Unit.

PREREQUISITE: Customer-supplied chilled water is required for the cooling system. See *S/360 Installation Manual - Physical Planning*, GC22-6820.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

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IBM 3115 PROCESSING UNIT

Purpose: Provides main and control storage, plus arithmetic and logic circuits for a S/370 mdl 115 including a direct disk attachment.

The 3115-0 and 3115-2 Processing Units are available in the following model groups:

Models:

3115-0	3115-2	Processor Storage Size
F	F2	65,536 bytes
FE	FE2	98,304 bytes
G	G2	131,072 bytes
GE	GE2	163,840 bytes
GF	GF2	196,608 bytes
	H2	262,144 bytes
	HG2	393,216 bytes ‡

For differences between the two model series refer to the "Systems" pages.

‡ NOTE: If 3411 Magnetic Tape and Control is attached see Magnetic Tape Adapter special feature paragraph for RPQ requirement.

Highlights: Depending upon the model, 65,536 to 393,216 bytes of processor storage are available. The basic main memory cycle time is 480 nanoseconds for 2 bytes. Sixteen general, sixteen control and four floating point registers are provided. The system design provides distributed microcoded processors within the Central Processing Unit for the independent handling of programs, input/output processing and diagnostic/maintenance. Direct attachment of the 3340 DASF Subsystem or the 3340/3344 DAS Subsystem (3115-2 only) is provided. Depending on model and features up to eight drives can be attached. In a 3340 DASF Subsystem, via the string switch capability (#9315), the 3340 mdl A2 can be shared with another S/370, except 3115-0 and 3125-0. For details and restrictions refer to the Direct Disk Attachment paragraph.

The 2311 Mdl 1/3340 - Series and the 2314/3340 - Series Compatibility features are available as options. They are mutually exclusive. Emulation is under DOS and DOS/VS only. 2311 mdl 1 emulation under DOS/VS requires SYSRES on 3340.

Capability to attach the 3803/3420 or 3411/3410 magnetic tape subsystem model 1, 2 or 3 via the optional Magnetic Tape Adapter.

Capability to natively attach one of the following card I/O: 2560 mdl A1 or A2, or the 5425 mdl A1 or A2 (96 column card) via the optional Integrated Card I/O Attachment features.

Capability to attach a wide variety of I/O devices via the optional Byte Multiplexer Channel. NOTE: The Integrated Card I/O Attachment and the Byte Multiplexer Channel cannot be installed on the same system unless RPQs are installed.

Capability to natively attach the 5213 Printer mdl 1 (85 cps) is provided with the optional integrated console printer attachment on the 3115. This console printer provides hardcopy output of operator messages presented on the Display Operator Console (DOC).

The optional 1052 Compatibility feature is available to emulate the 1052 Printer keyboard in the S/370 mdl 115. 1052 Compatibility (#8005) in combination with the 5213 Printer mdl 1 allows the model 115 to be used as a remote workstation with HASP-RMT/360. NOTE: The 1052 compatibility mode is not supported under DOS/VS. With DOS/VS, the 5213 mdl 1 will act as a slave unit to the DOC.

Capability to attach up to 5 synchronous lines, or up to 4 synchronous and up to 8 asynchronous lines is provided by the optional Integrated Communications Adapter with appropriate features.

Capability to attach the 5203 Printer mdl 3 or 3203 Printer mdl 1 or 2 is provided with optional Integrated Printer Attachment features.

The optional S/360 Model 20 and 1401/1440/1460 Compatibility features are available to allow execution of the instructions of those programs.

The Display Operator Console (DOC) is an integral part of the S/370 mdl 115 and enhances operator-machine communications. Data can be entered into main storage or into internal registers via the keyboard. Contents of storage or internal registers of the S/370 mdl 115 can be shown on the video screen with 16 lines of 56 characters/line. A portion of the screen is reserved to display machine status. The Service Processor (SVP) continuously monitors system operation and logs errors on the magnetic IBM Diskette device. The SVP initiates recovery on detection of error

conditions and provides control for the display, keyboard, console file and optional console printer.

The standard console file is the basic microprogram loading device for the system. It contains a small file device, which reads and writes on a removable magnetic IBM Diskette. The diskettes that will be supplied with the system will contain the required micro-code for the basic system, the optional features ordered for the system, and CE diagnostics.

The CE logout of machine and I/O related control checks and errors are recorded on the diskette for CE diagnosis, to enhance the reliability, availability, and serviceability of the S/370 mdl 115.

Dynamic Address Translation (DAT) is a standard facility on the model 115. Since logical storage addressing is not limited by the amount of available real storage, program size may exceed real storage size. This logical storage is referred to as "virtual storage" and may be as large as 16,777,216 bytes on the model 115.

Standard features include S/370 commercial instruction set, Extended Control (EC) Mode, Dynamic Address Translation, Channel Indirect Data Addressing, Program Event Recording (PER), Monitor Call, interval timer, time-of-day clock, CPU-Timer and Clock Comparator, store and fetch protect, byte oriented operand feature, error checking and correction of single bit errors on main storage, and Audible Alarm.

Control Storage: On the 3115-0, reloadable control storage for the Service Processor (SVP), and Direct Disk Attachment and the basic part of the Machine Instruction Processor (MIP) is provided as standard on the 3115 Processor Unit. In addition, reloadable control storage is provided with the optional Card I/O Attachment, Printer Attachment, Integrated Communications Adapter (ICA), Byte Multiplexer Channel. The MIP contains as standard, 20K words of 22 bits of control storage and may be expanded either to 24K words (4K Control Storage Extension, #4101) or to 28K words (8K Control Storage Extension, #4104). #4101 and #4104 are mutually exclusive. See Chart A below for possible feature combinations and control storage requirements.

NOTE: Customers who elect to purchase the 4K Control Storage Extension and later upgrade to the 8K Control Storage Extension should consider the purchase of the 8K Control Storage Extension initially because this field upgrade requires replacement of the 4K Control Storage Extension and installation of the 8K Control Storage Extension. This is, however, not recommended for customers considering to eventually convert to a 3115-2.

On the 3115-2, the Instruction Processing Unit (IPU) contains as standard, 12K words of control storage. Certain feature combinations can use up to two additional 4K words increments totaling 20K words of control storage. See Chart B for details.

Chart A: Listed below are the valid feature combinations and their respective requirements for additional control storage on the 3115-0.

Optional Features -- Model 3115-0	Basic Control Storage	4K Control Storage Extension ... #4101 Required *	8K Control Storage Extension ... #4104 Required *
Floating Point #3900 **	x	x	
Floating Point incldg Ext'd Precision #3910 **		x	x
1401/1440/1460 Cmpblty #4457	x	x	x
S/360 Mdl 20 Cmpblty #7520	x	x	x
2311-1/3340 Series Cmpblty #8060 ***		x	x
2314/3340 Series Cmpblty #8070 ***		x	x

* #4101 and #4104 are mutually exclusive.
** #3900 and #3910 are mutually exclusive.
*** #8060 and #8070 are mutually exclusive. In addition, #8060 and #8070 are mutually exclusive with specify #9190.

3115 Processing Unit (cont'd)

Chart B: Listed below are the valid feature combinations and their respective requirements for additional control storage on the 3115-2.

Optional Features - Model 3115-2	Basic Control Storage	First Control Storage Increment - #4101 Required	Second Control Storage Increment - #4101 & #4102 Required
Floating Point including Extended Precision #3910	x x	x x	x x x x
1401/1440/1460 Compatibility #4457 **	x	x x x	x x x x
S/360 Mdl 20 Compatibility #7520 **	x x x	x x	x x
2311-1/3340 Series Cmpblty #8060 *		x x x	x x x
2314/3340 Series Cmpblty #8070 *		x x x	x x x

* #8060 and #8070 are mutually exclusive. In addition, #8060 and #8070 are mutually exclusive with Specify feature #9190 or 3344 Attachment specify feature #9317.

** 1401/1440/1460 Compatibility (#4457) and S/360 Mdl 20 Compatibility (#7520) are mutually exclusive (may not be ordered on the same system unless RPQ is installed on the 3115-2). NOTE: RPQ cannot be installed if the 2311 Mdl 1/3340-Series Compatibility (#8060) or 2314/3340-Series Compatibility (#8070) is installed. Cannot be installed with 3344 Attachment (#9317). Specify feature #9315 is mutually exclusive with #4102 and/or #4460.

Input/Output Attachments - Native: The following integrated I/O attachments/adapters are provided for controlling the designated I/O devices. They are designed to interact with their respective I/O devices and should be installed/removed with them since the system is inoperative with only the attachment/adaptor installed.

Direct Disk Attachment (standard) -- this attachment is provided to attach the 3340 mdl A2 dual drive unit and control directly to the S/370 mdl 115. The attachment is addressed as channel 1. This attachment provides block multiplexing.
3340 DASD SUBSYSTEM. On the 3115-0 one 3340 mdl A2 and one 3340 mdl B2/B1 can be attached to provide up to four spindles. On the 3115 mdl 2 (w/o 3344 Attachment #9317) one 3340-A2 and up to three 3340 mdl B1/B2s can be attached to provide up to eight spindles.
3340/3344 DAS SUBSYSTEM. On the 3115-2 with 3344 Attachment #9317 installed: One 3340 mdl A2 and any combination of up to three 3340 mdl B1/B2s and 3344 mdl B2/B2Fs can be attached. With the String Switch (#8150) installed, the 3340 mdl A2 may be shared with another S/370 except 3115-0 and 3125-0. Specify features, String Switch Capability (#9315) and 3344 Attachment (#9317) are mutually exclusive. String Switch capability is not supported on a 3344 configuration. 4K DASD Control Storage Extension is required when either #9315 or #9317 is installed. Specify Fixed Head Attachment (#9190) if Fixed Head Feature is installed on 3340 Series drives. See Chart A for control storage requirements.

Magnetic Tape Adapter (optional) -- this feature attaches one of the following tape control units and is addressed as channel 2:

- 3411 Magnetic Tape Unit and Control mdl 1 -- tape control (20KB) housing one tape drive. Up to three 3410 Magnetic Tape Unit mdl 1s may be attached to the 3411 mdl 1.
- 3411 Magnetic Tape Unit and Control mdl 2 -- tape control (40KB) housing one tape drive. Up to five 3410 Magnetic Tape Unit mdl 2s may be attached to the 3411 mdl 2.
- 3411 Magnetic Tape Unit and Control mdl 3 -- tape control (80KB) housing one tape drive. Up to five 3410 Magnetic Tape Unit mdl 3s may be attached to the 3411 mdl 3.
- 3803 Tape Control mdl 3 -- up to eight 3420 mdl 3 (120KB) or mdl 5 (200KB) may be attached to the 3803.

Integrated Card I/O Attachments (optional) -- these features provide native attachment of one of the following: 2560 Multi-function Card Machine mdl A1 or A2
 5425 Multi-function Card Unit mdl A1 or A2

The Integrated Card I/O Attachment uses channel 0. Device address X'00D' is reserved for the 2560 or 5425.

The Integrated Card I/O Attachments and the optional Byte Multiplexer Channel cannot be installed together on the same system unless RPQs are installed.

Integrated Printer Attachment (optional) -- attachment features for the 5203 Printer mdl 3 or the 3203 Printer mdl 1 or 2 are provided. One printer unit may be natively attached. The printer attachment is addressed as channel 0 and the device address is X'00E'. The Universal Character Set (UCS) control is standard

on the 3203. On the 5203, UCS control may be specified on Integrated 5203 Mdl 3 Attachment (#4690).

Integrated Console Printer Attachment (optional) -- attaches the 5213 Printer mdl 1 to the 3115 to provide hardcopy of operator messages presented on the standard Display Operator Console. It uses address X'01F' (same as the Display Operator Console) on Channel 0. When the 1052 Compatibility feature is installed, the 5213 Printer mdl 1 is required.

Integrated Communications Adapter (ICA) (optional) -- provides the basic control storage and common circuits for direct attachment of up to five synchronous (BSC) communications lines OR up to eight asynchronous (start/stop) lines. See individual ICA features for limitations. The **Integrated Communications Adapter Extension (ICAE)** provides the capability to attach up to four BSC AND up to eight start/stop lines. IBM line adapters are provided within the model 115.

Input/Output Channel:

Byte Multiplexer Channel (Optional) -- provides for the attachment of a wide variety of low speed devices. The single channel available on the S/370-115 is functionally equivalent to the Byte Multiplexer Channel on S/360 mdls 22, 25, 30 and 40 and provides for a maximum of up to 8 control unit positions. 32 subchannels are provided as standard and are divided into 8 shared and 24 unshared subchannels.

The Integrated Card I/O Attachments and the Byte Multiplexer Channel cannot be installed together on the same system unless RPQs are installed.

Console Function -- system control functions are provided by the standard integrated Display Operator Console. It has the switches, keyboard, and lights necessary to operate and control the system. It uses address X'01F' on channel 0. The 5213 mdl 1 console printer (85 cps) may be attached optionally.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Specify Fixed Head Attachment (#9190) \$ if Fixed Head Feature is installed on 3340 Series drives. NOTE: The Fixed Head Attachment (#9190) cannot be installed with 2311-1/3340 Series Compatibility (#8060) or 2314/3340 Series Compatibility (#8070).

[4] Specify String Switch Capability (#9315) \$ if String Switch (#8150) is installed on the 3340 mdl A2. NOTE: 4K DASD Control Storage Extension (#4210) is prerequisite. Cannot be installed with #4102 or #4460 or 3344 Attachment (#9317)S. When String Switch is installed, an Emergency Power Off connection between the sharing systems is mandatory. RPQ DC 3621 (two system connection) or DC 3622 (multiple system connection) must be ordered.

The 3115-2 uses fixed addresses 160 to 167 for its attached disk drives. In the case of string switch, to avoid confusion in Job Control and Operation, the same addresses should be assigned to shared drives on the other system. In the case of the 3135, 3135-3, 3138 IFA, this requires specify code #9821 on the 3135 providing addresses 160 thru 167 to comply with the fixed addresses of the 3115. If intermixing 3330s and 3340s on the 3135 (#9315), no string switching with the 3115-2 is possible.

NOTE: The string switch of the DASD hardware function can be operated with the present DOS/VS standard DASD support. DOS/VS does not support the device reserve/release channel commands for program controlled sharing of attached DASD units. Therefore, it is the user's responsibility by appropriate organization and programming procedures to resolve conflicting references to shared files and insure data integrity. One method for controlling potential conflicts involves the use of operator commands DVC UP/DVC DN. For additional information, consult DOS/VS System Management Guide, GC33-5371.

[5] On the 3115-2 ... specify 3344 Attachment (#9317) \$ when 3344 mdl B2/B2F are installed. 4K DASD Control Storage Extension is required. Cannot be installed with any of the following: String Switch Capability (#9315), 231X/3340 Compatibility (#8060/#8070), S/360 Mdl 20 Compatibility (#7520), 1401/1440/1460 Compatibility (#4457), or 1403/3203 Carriage Control Feature (#4460).

[6] Minimum configuration: See "Minimum Configuration" in "Systems" for minimum I/O units required on a S/370 mdl 115.

[7] 1255, 1259 or 1419 Attachment -- specify #9336 (3115-0

\$ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

3115 Processing Unit (cont'd)

only). External Signal (#3898) is required to attach a 1255, 1259 or 1419.

[8] Specify #9807 for attachment of 3803 mdl 3 on the Magnetic Tape Adapter (#4675).

NOTE: RETAIN/370 ... CE access is by telephone.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 yr	Purchase	MMMC
3115	F	\$ 2,585	\$ 2,355	\$ 78,150	\$309
	FE	2,706	2,465	80,500	314
	G	2,827	2,575	82,850	319
	GE	2,948	2,685	85,200	326
	GF	3,159	2,880	91,000	337
	F2	3,400	3,090	102,550	362
	FE2	3,521	3,200	104,900	368
	G2	3,642	3,310	107,250	373
	GE2	3,763	3,420	109,600	378
	GF2	3,884	3,530	111,950	383
	H2	4,126	3,750	116,650	394
	HG2	4,715	4,285	129,950	420

* NOTE: Models H2 and HG2 require special feature #3860 unless RPQs are installed.

Plan Offering: Plan A, Additional Use Charge Rate:10%
Metering: Base Unit Machine Group: A Per Call: 3
Purchase Option: 55%† Useful Life Category: 2 Warranty: A
Model/Feature Additional Charge in lieu of AU Charge: 15%
Termination Charge Months: 6 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Field installable ... model downgrade from 3115-2 to 3115-0 is not recommended for field installation.

Planning for Model Conversions: When a customer requires feature changes and/or memory upgrades in addition to a model upgrade, consolidating the several changes into a single is not recommended.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	FE	G	GE	GF
F	\$2,350	\$4,700	\$7,050	\$12,850
FE		2,350	4,700	10,500
G			2,350	8,150
GE				5,800

From To	F2	FE2	G2	GE2	GF2	H2	HG2
F	\$24,400	\$26,750	\$29,100	\$31,450	\$33,800	\$38,500	\$51,800
FE		24,400	26,750	29,100	31,450	36,150	49,450
G			24,400	26,750	29,100	33,800	47,100
GE				24,400	26,750	31,450	44,750
GF					20,950	25,650	38,950
F2		2,350	4,700	7,050	9,400	14,100	27,400
FE2			2,350	4,700	7,050	11,750	25,050
G2				2,350	4,700	9,400	22,700
GE2					2,350	7,050	20,350
GF2						4,700	18,000
H2							18,300

SPECIAL FEATURES

EXPANSION BASE (#3860). [3115-2 only] Provides additional gate and blowers, etc., and is required if RPQs are not installed:

- for all model H2s and HG2s
- for models F2, FE2, G2, GE2 or GF2 if a Line Adapter Base 2 (#4792) or Line Adapter Base 3 (#4793) is required.

Maximum: One. Field Installation: Yes.

EXTERNAL SIGNALS (#3898). Provides six distinct external interrupt lines to request and identify an external interrupt response from the processing unit. Maximum: One per 3115. Cable Order: Required. Field Installation: Yes. Prerequisite: External devices must meet the interface specifications outlined in S/360 - Direct Control Feature - OEM 1, SRL GA22-6845.

FLOATING POINT (#3900). [3115-0 only] Adds 44 floating point arithmetic instructions ... these instructions with the standard set make up the Scientific Instruction Set. Field installation: Yes. Limitation: Cannot be installed with Floating Point Including Extended Precision (#3910).

FLOATING POINT INCLUDING EXTENDED PRECISION (#3910). Adds 51 floating point arithmetic instructions. Provides for floating point operation including extended precision to 28 hexadecimal

‡ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

† Purchase Option is 50% under Term Lease Plan (TLP).

digits. Field installation: Yes. Limitation: Cannot be installed with Floating Point (#3900). Prerequisite: See Chart A/B above for control storage requirements.

4K CONTROL STORAGE EXTENSION (#4101). Adds 4,096 words (22 bits wide) of control storage to the Machine Instruction Processor (3115-0) or Instruction Processing Unit (3115-2). Required for certain feature combinations ... see Chart A/B above for details. Limitation: Cannot be installed with 8K Control Storage Extension (#4104). Field installation: Yes ... see "Note" following "Field Installation" for 8K Control Storage Extension (#4104) below.

4K CONTROL STORAGE INCREMENT - 2nd (#4102). [3115-2 only] Expands the IPU control storage by 4,096 words (22 bits wide). Required for certain feature combinations ... see Chart B. Limitation: Cannot be installed with #4210 or specify feature #9315. Maximum: One. Field Installation: Yes. Prerequisite: 4K Control Storage Extension (#4101).

8K CONTROL STORAGE EXTENSION (#4104). [3115-0 only] Adds 8,192 words (22 bits wide) of control storage to the Machine Instruction Processor. Required for certain feature combinations ... see Chart A above for details. Limitation: Cannot be installed with 4K Control Storage Extension (#4101). Field Installation: Yes ... Note: Customers who may elect to purchase the 4K Control Storage Extension and later upgrade to the 8K Control Storage Extension should consider the purchase of the 8K Control Storage Extension initially because this field upgrade requires replacement of the 4K Control Storage Extension and installation of the 8K Control Storage Extension.

4K DASF CONTROL STORAGE EXTENSION (#4210). [3115-2 only] Adds 4,096 words (22 bits wide) to the DDA control storage. Required for string switch capability specify feature (#9315) or 3344 Attachment specify feature (#9317). Limitation: Cannot be installed with #4102 or #4460. Maximum: One. Field Installation: Yes.

1401/1440/1460 COMPATIBILITY (#4457). Microprogram controlled feature which, in combination with an emulator program under DOS/VS, permits the system to execute 1401/1440/1460 instructions. Field Installation: Yes. Prerequisites: See Chart A/B above for control storage requirements. Note: On the 3115-2, #4457 and S/370 Mdl 20 Compatibility (#7520) are mutually exclusive (may not be ordered on the same system unless RPQ is installed). Limitation: Cannot be installed with 3344 Attachment (#9317).

1403/3203 CARRIAGE CONTROL FEATURE (#4460). Allows the 3203 Printer with its tapeless carriage control to emulate the function of a tape controlled carriage and thus run programs written for a 1403 Printer. Limitations: The 5203 Printer is not supported by this feature. Cannot be installed with string switch capability (#9315) or 3344 Attachment specify feature (#9317). Field Installation: Yes. Prerequisite: 3203 Printer. Note: This feature is not required with DOS/VS Release 31 and subsequent releases.

INTEGRATED 3203 PRINTER ATTACHMENT (#4650). Control for attaching the 3203 Printer mdl 1 or 2. The Universal Character Set is standard. Specify: #9770 for mdl 1, or #9771 for mdl 2. Limitation: Cannot be installed with Integrated 5203 Attachment (#4690). Maximum: One. Field Installation: Yes. Prerequisite: Integrated 3203/5203 Printer Prerequisite (#4653).

INTEGRATED 3203/5203 PRINTER PREREQUISITE (#4653). Provides a common control base for attaching either the 3203 or 5203 Printer. Required as a feature for installation of the Integrated 3203 Printer Attachment (#4650) or Integrated 5203 Printer Attachment (#4690). Maximum: One. Field Installation: Yes.

INTEGRATED 2560 ATTACHMENT (#4670). Control for attaching the 2560 Multi-function Card Machine mdl A1 or A2. Specify: #9800‡ for mdl A1, or #9801‡ for mdl A2. Limitation: Cannot be installed with Integrated 5425 Attachment (#4695) or Basic Byte Multiplexer Channel (#5248) ... installation of RPQs are required to install #4670 with Basic Byte Multiplexer Channel (#5248). Maximum: One. Field Installation: Yes. Prerequisite: #9727 is required on the 2560 MFCM ... see "Specify" under 2560.

2560 CARD PRINT CONTROL (#4674). Provides control for Card Print capability on the 2560 Multi-function Card Machine mdl A1. Specify: #9797‡ for first two print lines, #9798‡ for second two, #9799‡ for third two, when corresponding Card Print features (#1575, 1576, 1577) are installed on the 2560 mdl A1. Field Installation: Yes. Prerequisite: Integrated 2560 Attachment (#4670) on the 3115.

MAGNETIC TAPE ADAPTER (#4675). Provides control for attachment of one 3411 Magnetic Tape Unit and Control mdl 1, 2 or 3 or one 3803 Tape Control mdl 3. See 3420 and 3803 or 3411 and 3410 for additional ordering instructions. The Magnetic Tape Adapter is addressed as channel 2. Maximum: One. Specify: #9807 for attachment of 3803 mdl 3. See "Highlights" for additional information. Field Installation: Yes. Limitation: A 3803 and 3411 cannot coexist on the Magnetic Tape Adapter.

3115 Processing Unit (cont'd)

Prerequisites: S/370 mdl 115/125 Attachment (#7361) on the 3411, except for 3115 mdl HG2. When attached to 3115 mdl HG2, RPQ is required on the 3411.

INTEGRATED 5203 MDL 3 PRINTER ATTACHMENT (#4690). Control for attaching the 5203 Printer mdl 3. **Limitation:** Cannot be installed with Integrated 3203 Printer Attachment (#4650). **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Integrated 3203/5203 Printer Prerequisite (#4653) and #9223 on the 5203 mdl 3. **Specify:** #9151 for 5203 with 120 print positions, or #9152 for 5203 with 132 print positions. Specify Universal Character Set Control (#9848) when Universal Character Set Attachment (#8639) is specified on the 5203 mdl 3.

INTEGRATED 5213 PRINTER MDL 1 ATTACHMENT (#4692). Attaches the 5213 Printer mdl 1. Includes a special cable to support the printer. **Maximum:** One. **Field Installation:** Yes.

INTEGRATED 5425 ATTACHMENT (#4695). Control for attaching the 5425 Multi-function Card Unit mdl A1 or A2. **Specify:** #9183 for mdl A1, or #9184 for mdl A2. **Limitations:** Cannot be installed with Integrated 2560 Attachment (#4670) or Basic Byte Multiplexer Channel (#5248) ... installation of RPQs are required to install #4695 with Basic Byte Multiplexer Channel (#5248). **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** If the 5425 is attached to the 3115 either a 3203 or 5203 Printer is required to provide the necessary power. If, however, a separate power supply for the 5425 is desired, IBM will provide it on an RPQ basis.

BASIC BYTE MULTIPLEXER CHANNEL (#5248). To attach low speed byte multiplex devices ... see "Byte Multiplexer Channel" under "Input/Output Channel." Feature includes control storage necessary for IOP operation. **Limitations:** The Basic Byte Multiplexer Channel (#5248) and the Integrated Card I/O Attachments (#4670 or #4695) cannot be installed together on the same system unless RPQs are installed. On the 3115-2, only the Extended Byte Multiplexer Channel (#5249 with #5248 as a prerequisite) with a data rate up to 25 KB is available. **Specify:** On the 3115-0, specify #9336 when attaching a 1255, 1259 or 1419. **Maximum:** One. **Field Installation:** Yes.

EXTENDED BYTE MULTIPLEXER CHANNEL (#5249). [3115-2 only] Provides the additional circuitry to enable the Basic Byte Multiplexer Channel to operate at an improved byte data rate up to 25KB. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Basic Byte Multiplexer Channel (#5248).

S/360 MODEL 20 COMPATIBILITY (#7520). Microprogram controlled feature which, in combination with special software, permits the system to execute S/360 mdl 20 instructions. **Field Installation:** Yes. **Note:** On the 3115-2, #7520 and 1401/1440/1460 Compatibility (#4457) are mutually exclusive (may not be ordered on the same system unless RPQ is installed). **Limitation:** Cannot be installed with 3344 Attachment (#9317).

1052 COMPATIBILITY (#8005). Operates on the 5213 Printer mdl 1 and standard keyboard as an operator console in S/360-1052 mode only. In this emulation mode of operation the Video/Display acts as a slave unit to the printer. The 1052 Compatibility feature in combination with the 5213 Printer mdl 1 allows running of HASP/360 RMT 360 (stand alone program) on the S/370 mdl 115. **Note:** The 1052 compatibility mode is not supported under DOS/VS. With DOS/VS the 5213 mdl 1 acts as a slave unit to the DOC. **Field Installation:** Yes. **Prerequisites:** Integrated 5213 Printer Mdl 1 Attachment (#4692) and the 5213 Printer mdl 1.

2311 MDL 1/3340 - SERIES COMPATIBILITY (#8060). Permits the emulation of 2311 mdl 1 files on the 3340 disk storage. The user program may access both the emulated 2311 mdl 1 data as well as the native data set. This provides a "mixed mode" operating environment. **Limitation:** #8060 cannot be installed with #8070, #9190 or #9317. **Field Installation:** Yes. **Prerequisites:** See Chart A/B above for control storage requirements. **Note:** When running DOS Rel. 21 thru 26, 1052 Compatibility (#8005), the 5213 mdl 1 console printer and, if a 3203 Printer is attached, the 1403/3203 Carriage Control Feature (#4460) are prerequisites. The 5203 Printer is not supported by #4460. Emulation under DOS/VS requires SYSRES on the 3340 DASF.

2314/3340 - SERIES COMPATIBILITY (#8070). Permits the emulation of 2314 files on the 3340 disk storage. The user program may access both the emulated 2314 data set as well as the native data set. This provides a "mixed mode" operating environment. **Limitation:** #8070 cannot be installed with #8060, #9190 or #9317. **Field Installation:** Yes. **Prerequisites:** See Chart A/B above for control storage requirements. **Note:** When running DOS Rel. 21 thru 26, 1052 Compatibility (#8005), the 5213 mdl 1 console printer and, if a 3203 Printer is attached, the 1403/3203 Carriage Control Feature (#4460) are prerequisites. The 5203 Printer is not supported by #4460. Emulation under DOS/VS requires SYSRES on the 3340 DASF.

⌘ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

COMMUNICATIONS FEATURES

INTEGRATED COMMUNICATIONS ADAPTER (ICA) (#4640). Provides the basic control storage and common circuits for direct attachment of up to five synchronous (BSC) communication lines or up to eight asynchronous (start/stop) communication lines depending upon line speed. All combinations of BSC and start/stop lines require the Integrated Communications Adapter Extension (#4641). Additional features are required to create appropriate line interfaces for the individual lines. Figures 1A and 1B schematically represent the feature build-up. Figure 1A shows the feature build-up for asynchronous lines or for combinations of asynchronous and synchronous lines. Figure 1B shows the feature build-up when only synchronous lines are required. The ICA provides as standard:

- Autopoll Start/Stop and BSC
- Multipoint central station functions Start/Stop and BSC
- Multipoint tributary station functions BSC only
- EBCDIC transparent mode BSC only
- EBCDIC or ASCII code BSC only

Refer to Figures 2A and 2B for attachable terminals and for configuration requirements prior to ordering features below. The normal procedure requires completion of ICA Specification Form with each model 115 containing feature #4640.

Note:

(or refer to ICA Configurator

Manual, GA33-1513).

Customer Responsibilities -- see M 2700 pages for customer responsibilities regarding communications facilities and services. **Communications Facilities** -- see M 2700 pages for communications facility requirements with this feature. **Maximum:** One. **Field Installation:** Yes.

INTEGRATED COMMUNICATIONS ADAPTER EXTENSION (ICAE) (#4641). This feature is required for all combinations of BSC and start/stop lines. Extends the communications capability to up to four BSC and up to eight start/stop lines depending upon line speed. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ICA (#4640).

ASYNCHRONOUS LINE GROUP (ALG) (#1201). Permits attachment of up to four Medium Speed Asynchronous Lines (AL) (#1231) or up to four Low Speed Asynchronous Line Pairs (ALP) (#1241) or up to four Telegraph Line Pairs (TLP) (#7881). The lines within the ALG, positions A1 thru A4, must be installed in ascending order. **Specify:** One line control specify code from Figure 2A. **Limitation:** All lines in the ALG must have the same line speed and control. Different terminals can be attached, provided they use the same speed and line control. See Figure 2A. ALG (#1201) and SLHS (#7121) are mutually exclusive. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ICA (#4640).

ASYNCHRONOUS LINE, MEDIUM SPEED (AL) (#1231). Provides for the attachment of one non-switched 600 bps start/stop communications line. The 3767 terminal can be attached to this feature (at EC 380427 plus EC 380628) via switched or non-switched lines at 300 bps and via non-switched lines at 600 or 1200 bps. Clocking speed is selected at installation time. Connects to the line via a modem or IBM Line Adapter. The lines are installed in ascending order, A1 thru A4. **Note:** IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. **Limitations:** See Figure 5, Max. ICA Configuration. #1231, #1241 and #7881 cannot be intermixed within the ALG. **Maximum:** Four. **Field Installation:** Yes. **Prerequisite:** ALG (#1201).

ASYNCHRONOUS LINE PAIR, LOW SPEED (ALP) (#1241). Provides for the attachment of two switched 110.0 bps or two switched or non-switched 134.5 bps start/stop communications lines. Connects to the line via a modem or IBM Line Adapter. The lines are installed in ascending order, A1 thru A4. **Note:** IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. **Limitations:** See Figure 5, Max. ICA Configuration. #1231, #1241 and #7881 cannot be intermixed within the ALG. **Maximum:** Four. **Field Installation:** Yes. **Prerequisite:** ALG (#1201).

AUTO CALL ADAPTER (ACA) (#1291, 1292, 1295, 1296). Provides automatic dialing capabilities on switched facilities. One of these features is required for each line equipped to automatically originate calls on switched networks. See Figure 3 for the selection of correct feature code. **Limitation:** The use of Auto Call in a line group precludes the last two lines/line pairs of that group ... see Figure 3. **Maximum:** Two per line group ... maximum total, four. **Field Installation:** Yes. **Prerequisite:** See Figure 3.

IBM LEASED LINE ADAPTER (#4743). A modem for start/stop data transmission at 134.5 or 600 bps over non-switched facilities. This line adapter operates with Leased Line Adapters on other IBM

3115 Processing Unit (cont'd)

products. Selection between 2-wire and 4-wire operation is made at installation time. See Leased Line Adapter in SRL GA24-3435 for specifications and restrictions. **Specify:** See Figures 4C and 4D. **Maximum:** See Figures 4C and 4D. **Field Installation:** Yes. **Prerequisites:** AL (#1231) or ALP (#1241) and a Line Adapter Base (#4792 or #4793) ... also see Figures 4C and 4D.

IBM 1200 BPS LINE ADAPTER (#4781, #4782, #4791). A modem for BSC data transmission at up to 1200 bps over non-switched facilities or switched network. Also for start/stop transmission at 300, 600 or 1200 bps over non-switched facilities to the 3767 terminal. Unclocked and must interface to a SLC (#7141-7144) or AL (#1231).

The Line Adapter is available in three different versions:

- #4781 -- non-switched
- #4782 -- switched with autoanswer
- #4791 -- switched with autocall and autoanswer

Attachment to non-switched facilities is via an IBM provided cable directly to the line. Attachment to the switched network is via an IBM provided cable to a common carrier arrangement type CBS or equivalent. **Customer Responsibilities** ... see M 2700 pages. **Communications Facilities** ... see M 2700 pages. **Specify:** See Figures 4C and 4D. **Maximum:** See Figures 4C and 4D. **Field Installation:** Yes. **Prerequisites:** SLC (#7141-7144) or AL (#1231) and a Line Adapter Base (#4792 or #4793). Also see Figures 4C and 4D. ACA (#1295 or #1296) is required for #4791.

LINE ADAPTER BASE 2 (LAB 2) (#4792). Permits attachment of up to two IBM 1200 bps Line Adapters and up to four IBM Leased Line Adapters. The Line Adapters are tied to specific line positions. See Figure 4C for configuration and possible line combinations. **Note:** LAB 2 is required for IBM 1200 bps Line Adapters with autoanswer (#4782) or with autocall and autoanswer (#4791). **Limitation:** LAB 2 (#4792) and LAB 3 (#4793) are mutually exclusive. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** On 3115-2, LAB 2 requires Expansion Base (#3860) unless RPQs 7B0141 and 7B0132 are installed.

LINE ADAPTER BASE 3 (LAB 3) (#4793). Provides attachment of up to four IBM 1200 bps Line Adapters and up to eight IBM Leased Line Adapters. The Line Adapters are tied to specific line positions. See Figure 4D for configuration and possible line combinations. **Limitation:** LAB 2 (#4792) and LAB 3 (#4793) are mutually exclusive. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** On 3115-2, LAB 3 requires Expansion Base (#3860) unless RPQs are installed.

SYNCHRONOUS LINE GROUP (SLG) (#7100). Permits attachment of up to four medium speed BSC lines, SLC (#7141-7144) and/or SL (#7151-7154). Maximum line speed is 1200 and 7200 bps respectively. The lines in this group, positions S1 thru S4, must be installed in ascending order. The lines can have different line speeds within the maximum specified. **Specify:** Maximum line speed in the group: #9751¢ for 1200 bps maximum ... #9753¢ for 2400 bps max ... #9754¢ for 4800 bps max ... #9757¢ for 7200 bps max. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ICA (#4640).

SYNCHRONOUS LINE HIGH SPEED (SLHS) (#7121). Provides for the attachment of one non-switched BSC line at speeds up to 50.0 kbps. See Figure 1B. This is a digital current interface for attachment to facility E1, E2 or E3. **Note:** Only for non-switched point-to-point lines. **Limitations:** This line has a load factor of 100% and must not be operated simultaneously with any other line in the ICA ... see Figure 1B. SLHS (#7121) and ALG (#1201) are mutually exclusive. **Maximum:** One **Field Installation:** Yes. **Prerequisite:** ICA (#4640).

SYNCHRONOUS LINE MEDIUM SPEED WITH CLOCK (SLC) (#7141-7144).

- #7141 -- Line position S1
- #7142 -- Line position S2
- #7143 -- Line position S3
- #7144 -- Line position S4

Line positions S1 thru S4 must be installed in ascending order.

Each feature provides for the attachment of one switched or non-switched BSC line. The clock can be set by the user for a transmission rate of 600 bps or 1200 bps. Connects to the line via an unclocked modem or IBM Line Adapter. **Notes:** IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. SL (#7151-7154) may be intermixed with SLC (#7141-7144) within the SLG. **Limitations:** See Figure 5, Max. ICA Configuration. #7141 is mutually exclusive with #7151, #7142 with #7152, #7143 with #7153, and #7144 with #7154. **Maximum:** #7141 thru #7144, one each. **Field Installation:** Yes. **Prerequisite:** SLG (#7100).

SYNCHRONOUS LINE MEDIUM SPEED (SL) (#7151-7154).

- #7151 -- Line position S1
- #7152 -- Line position S2
- #7153 -- Line position S3
- #7154 -- Line position S4

Line positions S1 thru S4 must be installed in ascending order.

Each feature provides for the attachment of one switched or non-switched BSC line. Non-switched lines with switched network back-up are supported. Maximum line speed on non-switched lines is 7200 bps; on switched back-up network 3600 bps; on switched network 4800 bps. See Figure 2B for detailed speed and facility information. Connects to the line via a modem. The modem must provide clocking. **Note:** SL(#7151-7154) may be intermixed with SLC (#7141-7144) within the SLG. **Limitations:** See Figure 5, Max. ICA Configuration. #7151 is mutually exclusive with #7141, #7152 with #7142, #7153 with #7143, and #7154 with #7144. **Maximum:** #7151 thru #7154, one each. **Field Installation:** Yes. **Prerequisite:** SLG (#7100).

TELEGRAPH LINE PAIR (TLP) (#7881). Provides for the attachment of two non-switched single current telegraph lines at 45.5, 56.9, 74.2 or 75 bps. Attachment to the lines is via an IBM provided external cable. Lines A1 thru A4 are installed in ascending order. **Limitations:** See Figure 5, Max. ICA Configuration. #1231, #1241 and #7881 cannot be intermixed within the ALG. **Maximum:** Four. **Field Installation:** Yes. **Prerequisite:** ALG (#1201).

MODEMS One of the following modems can be attached to each of the BSC lines of the ICA (#4640). **Prerequisite:** SL (#7151-7154).

Modem	Speed (bps)
3863	2400/1200
3872	2400/1200
3864	4800/2400
3874	4800/2400
3875	7200/3600/1800

Note: For communications capabilities, product utilization and special features, see 3863, 3864, 3872, 3874, 3875 and M 2700 pages.

¢ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

3115 Processing Unit (cont'd)

Special Feature Prices:	MAC/ MRC	TLP/ MLC		MMMC	
		4 yr	Purch		
3115-0 and 3115-2					
External Signals	#3898*	\$110	\$100	\$4,125	\$1.00
Fltg Pt Includ Ext Precision	3910	NC	NC	**	NC
4K Control Storage Extension	4101	55	50	1,335	1.50
1401/1440/1460 Compat	4457	NC	NC	**	NC
1403/3203 Carr Cntrl Fea	4460	NC	NC	**	NC
Int 3203 Printer Attachment	4650*	83	76	2,515	7.50
Int 3203/5203 Ptr Prereq	4653	88	80	2,585	8.50
Int 2560 Attachment	4670*	153	140	5,780	11.50
2560 Card Print Control	4674*	33	30	1,235	2.00
Magnetic Tape Adapter	4675*	110	100	4,125	3.00
Int 5203 Ptr Mdl 3 Attach	4690*	83	76	3,145	7.50
Int 5213 Ptr Mdl 1 Attach	4692*	110	100	4,125	3.00
Int 5425 Attachment	4695*	153	140	5,780	19.50
Basic Byte Mplx Channel	5248*	208	190	7,865	20.50
S/360 Mdl 20 Compatibility	7520	NC	NC	**	NC
1052 Compatibility	8005	NC	NC	**	NC
2311 mdl 1/3340-Series Cmpt	8060	NC	NC	**	NC
2314/3340-Series Cmpt	8070	NC	NC	**	NC

Communications Features

Int Communications Adapter	4640*	225	205	8,460	25.50
Int Comm Adapter Extension	4641*	83	76	3,105	1.50
Asynchronous Line Group	1201*	43	40	1,660	3.00
Async Line, Medium Speed	1231*	43	40	1,660	2.50
Async Line Pair, Low Speed	1241*	60	55	2,255	3.50
Auto Call Adapter,					
- line position A1	1291*	21	20	808	1.50
- line position A2	1292*	21	20	808	1.50
- line position S1	1295*	21	20	808	1.50
- line position S2	1296*	21	20	808	1.50
IBM Leased Line Adapter	4743*	15	14	417	2.50
IBM 1200 bps Line Adapter,					
non-switched	4781*	16	15	525	2.50
switched w autoanswer	4782*	21	20	700	3.00
sw w autocall & autoans	4791*	71	65	1,935	11.50
Line Adapter Base 2	4792*	28	26	1,020	2.00
Line Adapter Base 3	4793*	28	26	1,020	2.00
Synchronous Line Group	7100*	43	40	1,660	3.00
Sync Line High Speed	7121*	110	100	4,125	8.50
Sync Line Med Spd w Clock,					
line position S1	7141*	60	55	2,255	3.50
line position S2	7142*	60	55	2,255	3.50
line position S3	7143*	60	55	2,255	3.50
line position S4	7144*	60	55	2,255	3.50
Sync Line Med Speed,					
line position S1	7151*	49	45	1,870	3.00
line position S2	7152*	49	45	1,870	3.00
line position S3	7153*	49	45	1,870	3.00
line position S4	7154*	49	45	1,870	3.00
Telegraph Line Pair	7881*	60	55	2,255	9.00

3115-0 Only

Floating Point	3900	NC	NC	**	NC
8K Control Storage Extension	4104	110	100	2,670	3.00

3115-2 Only

Expansion Base	3860	45	41	1,710	1.00
4K Control Stor Incremnt-2nd	4102	55	50	1,335	1.50
4K DASF Cntrl Storage Exten	4210	55	50	1,335	1.50
Extended Byte Mplx Channel	5249	35	32	1,330	3.00

⌘ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on the same diskette.

* Feature supplies CPU diskette.

** CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. \$290 on purchased machines when combined with changes subject to a distribution fee to include any number of diskette-only changes ordered on the same diskette.

FIGURE 1A

INTEGRATED COMMUNICATIONS ADAPTER SCHEMATIC
FEATURE BUILD-UP

ICAE (#4641)	LINE GROUP	LINE INTERFACE	Asynch Line Position	Sync Line Position	
ICA (#4640)	ALG (#1201) (2)	AL (#1231), or ALP (#1241), or TLP (#7881)	A1		
		AL (#1231), or ALP (#1241), or TLP (#7881)	A2		
		AL (#1231), or ALP (#1241), or TLP (#7881)	A3 (1)		
		AL (#1231), or ALP (#1241), or TLP (#7881)	A4 (1)		
	SLG (#7100)	SL #7151, or SLC (#7141)			S1
		SL #7152, or SLC (#7142)			S2
		SL #7153, or SLC (#7143)			S3 (1)
		SL #7154, or SLC (#7144)			S4 (1)

(1) Auto Call Adapters (#1291, 1292, 1295 and 1296) restrict the use of these line positions ... see Figure 3.

(2) ALG (#1201) and SLG (#7121) are mutually exclusive.

FIGURE 1B

ICAE (#4640)	LINE GROUP	LINE INTERFACE	SYNC LINE POSITION
ICA (#4640)	SLG (#7100)	SL #7151, or SLC (#7141)	S1
		SL #7152, or SLC (#7142)	S2
		SL #7153, or SLC (#7143)	S3
		SL #7154, or SLC (#7144)	S4
	SLHS (#7121) (2)	S5	

(2) ALG (#1201) and SLHS (#7121) are mutually exclusive. Note: SLHS (#7121) cannot be operated concurrently with lines in position S1 thru S4.

FIGURE 2A

START/STOP TERMINALS

TERMINALS	SPEED (bps)	FACILITIES	LINE INTERFACE FEATURE	LINE CONTROL SPECIFY
1030	600.0	D2	1231	9740⌘
1050	75.0	A4	7881	9736⌘
	134.5	C1, C2, D1	1241	9738⌘
1060	134.5	D1	1241	9738⌘
2740 mdl 1	134.5	C1, C2, D1	1241	9738⌘
2740 mdl 2	75.0	A4	7881	9736⌘
	134.5	D1	1241	9738⌘
	600.0	D2	1231	9739⌘
2741	134.5	C1, C2, D1	1241	9738⌘
3767 mdl 1, 2 w #7111 or #7113	300.0	C1, D1	1231	9739⌘
3767 mdl 1, 2, 3 w #7112	600 or 1200	D2	1231	9739⌘
5010 mdl Axx	134.5	C1, C2, D1	1241	9738⌘
	600.0	D2	1231	9739⌘
5100/5110	134.5	B1, B2, C1, C2, D1	1241	9738⌘
	300.0	C1, D1	1231	9739⌘
AT&T	45.5	A1	7881	9733⌘
83B2/83B3	56.9	A2	7881	9734⌘
WU 115A	74.2	A3	7881	9735⌘
TWX-33/35	110.0	C3	1241	9737⌘

3115 Processing Unit (cont'd)

FIGURE 4D

LINE ADAPTER BASE 3 (#4793) ... Maximum, 12 IBM Line Adapters

LINE POSITION	LINE ADAPTER	LINE ADAPTER POSITION SPECIFY	PREREQ	NOTE
A1 1st line	4743	9485 ¢	1241	
A1 2nd line	4743	9486 ¢	9485	
A2 1st line	4743	9487 ¢	1241	
A2 2nd line	4743	9488 ¢	9487	
A3 1st line	4743	9489 ¢	1241	
A3 2nd line	4743	9490 ¢	9489	
A4 1st line	4743	9491 ¢	1241	
A4 2nd line	4743	9492 ¢	9491	
S1	4781	9493 ¢	7141	
S2	4781	9494 ¢	7142	
S3	4781	9495 ¢	7143	
S4	4781	9496 ¢	7144	

---- OR ----

A1 (2)	4743 or 4781	9481, 9501 ¢	1231	Excludes line adapter in position S4 (#9496)
A2 (2)	4743 or 4781	9482, 9502 ¢	1231	Excludes line adapter in position S3 (#9495)
A3 (2)	4743 or 4781	9483, 9503 ¢	1231	Excludes line adapter in position S2 (#9494)
A4 (2)	4743 or 4781	9484, 9504 ¢	1231	Excludes line adapter in position S1 (#9493)
S1	4781	9493 ¢	7141	Excludes line adapter in position A4 (#9484)
S2	4781	9494 ¢	7142	Excludes line adapter in position A3 (#9483)
S3	4781	9495 ¢	7143	Excludes line adapter in position A2 (#9482)
S4	4781	9496 ¢	7144	Excludes line adapter in position A1 (#9481)

(2) #4781 may be used only with the 3767 terminal.

FIGURE 5

MAXIMUM ICA CONFIGURATION

All lines/line pairs are assigned load factors.
The sum of all load factors must not exceed 100%.

LOAD FACTOR IN %

ASYNCHRONOUS LINES	1-2 Line Pairs (1-4 lines)	3-4 Line Pairs (5-8 lines)		
	TLP at 45.5 & 56.9 bps TLP at 74.2 & 75.0 bps ALP at 110.0 & 134.5 bps	20% 20	20% 40 40	
ALG, up to 4 lines	20			
AL at 300/600/1200 bps	20			
SYNCHRONOUS LINES	1-2 Lines		3-4 Lines	
	Autopoll Not Used	Autopoll Used	Autopoll Not Used	Autopoll Used
SLG w max 1200 bps SLG w max 2400 bps SLG w max 4800 bps SLG w max 7200 bps	20 20 40 60	25 25 50 75	20 40 80	25 50 100
SLHS at max. 50 kbps	1 Line pt-to-pt 100			

~~¢~~ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.



IBM 3125 PROCESSING UNIT

Purpose; Provides main and control storage, plus arithmetic and logic circuits for a S/370 mdl 125.

The 3125-0 and 3125-2 Processing Units are available in the following model groups:

Models:

3125-0	3125-2	Processor Storage Size
FE	FE2	98,304 bytes
G	G2	131,072 bytes
GE	GE2	163,840 bytes
GF	GF2	196,608 bytes
H	H2	262,144 bytes
	HG2	393,216 bytes ‡
	I2	524,288 bytes ‡

For differences between the two model series refer to the "Systems" pages.

‡ If 3411 Magnetic Tape and Control is attached see Magnetic Tape Adapter special feature paragraph for RPQ requirement.

Highlights: 98,304 bytes up to 524,288 bytes of processor storage are available. The basic main memory cycle time is 480 nanoseconds for 2 bytes. Sixteen general purpose, sixteen control and four floating point registers are provided. The system design provides distributed microcoded subprocessors for the independent handling of programs -- Instruction Processing Unit (IPU), Input/Output Processing (IOPs), and Diagnostic/Maintenance (SVP).

Direct attachment of the 3333/3330 DASD Subsystem or the 3340 DASF Subsystem or the 3340/3344 DAS Subsystem (3125-2 only) is provided. Depending on model and features up to sixteen drives can be attached. In a 3340 Subsystem the 3340 mdl A2 and its attached 3340 drives can be shared with another S/370, except 3115-0 or 3125-0, via the String Switch capability (#9315).

The 2311/3330 - Series, the 2311 Mdl 1/3340 - Series and the 2314/3340 - Series Compatibility features are available as options. They are mutually exclusive. Emulation is under DOS and DOS/VS only. 2311 mdl 1 emulation under DOS/VS requires SYSRES on 3340 or on 3330.

Capability to attach the 3803/3420 or 3411/3410 magnetic tape subsystem mdls 1, 2 or 3 via the Magnetic Tape Adapter.

Capability to natively attach the following card I/Os through appropriate Integrated Card I/O Attachments: 2560 mdl A1; 3504 mdls A1, A2; 3525 mdls P1, P2, P3; and the 5425 mdls A1, A2 (96 column card).

Capability to natively attach the 5213 mdl 1 console printer (85 cps) is provided with the Integrated 5213 Printer Mdl 1 Attachment. This console slave printer provides hardcopy output of operator messages presented on the Video/Display (CRT) console. The 1052 Compatibility feature is available.

Capability to natively attach up to 6 synchronous and up to 16 asynchronous lines is provided by the Integrated Communications Adapter with appropriate features.

Capability to natively attach the 3203 Printer is provided with the Integrated 3203 Printer Attachment.

The 1403/3203 Carriage Control Feature provides the capability to load information contained in the 1403 Carriage Control Tape into the 3203 Forms Control Buffer.

S/360 Model 20 Compatibility and 1401/1440/1460 Compatibility features are provided to allow execution of the instructions of those systems.

The Operator Console is an integral part of the 3125. The standard on-line Video/Display-Keybaord enhances operator (human factor) - machine communications. Data can be manually entered into processor main storage or into internal registers via the keyboard. Contents of storage or internal registers of the 3125 can be displayed on the Video/Display screen. The Video/Display with 16 lines of 56 characters/line and keyboard are designed for use as an operator console. A portion of the screen is reserved to display machine status. The Service Processor (SVP) continuously monitors system operation and logs errors on the magnetic IBM Diskette device. The SVP initiates recovery on detection of error conditions and provides control for the Display, Keyboard, Magnetic Diskette and optional console printer.

The standard console file is the basic microprogram loading device for the system. The console file contains a small read/write file device that provides the microcode for the system on removable

magnetic IBM Diskettes. The diskettes that are supplied with the system will contain the required microcode for the basic system, the optional features ordered for the system, and CE diagnostics.

The CE logout of machine and I/O related control checks and errors are recorded on the console file diskette for CE diagnosis, to enhance the reliability, availability, and serviceability of the model 125.

Extended Control (EC) Mode expands the structure of the Program Status Word to accommodate the control of new S/370 features and extends the number of permanently assigned main storage locations. The model 125 can operate in either EC Mode or Basic Control (BC) Mode as defined for the S/360.

Dynamic Address Translation (DAT) is a standard facility on the model 125. When the model 125 is in EC Mode with Translation Mode operable, programs are not required to be completely resident in main memory for execution. Under Supervisor Control, portions of programs (Pages) may be stored on a direct access device until needed, at which time they will be returned to main storage and may be relocated to any available location. Program addresses are treated as "logical addresses" and the translation feature develops "real addresses." Since logical storage addressing is not limited by the amount of available real storage, program size may exceed real storage size. This logical storage is referred to as "virtual storage" and may be as large as 16,777,216 bytes on the S/370 mdl 125.

Program Event Recording (PER), a standard feature, is a debugging aid which permits four types of events to be selectively monitored: (1) Successful branches ... (2) Instruction fetch address compare ... (3) Main storage alteration address compare ... (4) General Register alteration address compare.

Standard features include a S/370 commercial instruction set, Extended Control (EC) Mode, Dynamic Address Translation, Channel Indirect Data Addressing, Program Event Recording, Monitor Call, interval timer, time-of-day clock, CPU-Timer and Clock Comparator, store and fetch protect, byte-oriented operand feature, error checking and correction on main storage, automatic instruction retry, and audible alarm.

Control Storage: Reloadable control storage for the Service Processor (SVP), direct DASD attachment, and Instruction Processing Unit (IPU) are provided as standard on the 3125 Processing Unit. In addition, reloadable control storage is available for the optional Card I/O Attachment, Printer Attachment, Integrated Communications Adapter (ICA), byte Multiplexer Channel, and Console Printer Attachment. Control storage is loaded from the diskette housed in the Service Console Unit.

The IPU of the 3125-0 contains as standard 12K words of control storage. Certain features/combinations require up to two 4K word increments in addition. See Chart A for details.

The IPU of the 3125-2 contains as standard 16K words of control storage. One 8K word increment may be ordered as an optional feature for use with certain feature combinations. See Chart A for details.

Chart A: Listed below are the valid feature combinations and their respective requirements for additional control storage.

Optional Features	Basic Control Storage												#4105 Control Storage Extension Req'd					
Model 3125-2	Basic Control Storage												Second Control Storage Increment ... (#4101) and (#4102) Req'd					
Model 3125-0	Basic Control Storage	First Control Storage Increment ... (#4101)											Second Control Storage Increment ... (#4101) and (#4102) Req'd					
1401/1440/1460 Compatibility (#4457) *	x		x	x											x	x	x	x
S/360 mdl 20 Compatibility (#7520) *	x	x	*	*			x	x	x	*					x	x	x	*
Floating Point Including Extended Precision (#3910)		x	x			x	x	x							x	x	x	x
2311 Mdl 1/3330-Series Compatibility (#8040) **						x	x							x	x			
2311 Mdl 1/3340-Series Compatibility (#8060) **						x		x						x		x		
2314/3340-Series Compatibility (#8070) **						x			x	x				x		x		x

* 1401/1440/1460 Compatibility (#4457) and S/360 Model 20 Compatibility (#7520) are mutually exclusive (may not be ordered on the same system unless is installed on the 3125. Cannot be installed with 3344 Attachment (#9317). NOTE RPQ cannot be installed if the 2311 Mdl 1/3340-Series Compatibility (#8060) or 2314/3340-Series Compatibility (#8070) is installed.

3125 Processing Unit (cont'd)

** (#8040) and (#8060) and (#8070) are mutually exclusive. In addition, #8060 or #8070 are mutually exclusive with specify feature #9190 or 3344 Attachment specify feature (#9317). #9190 does not require additional control storage.

NOTE: Specify feature #9315 is mutually exclusive with #4105 and/or #4460.

Input/Output Attachments - Native: The following integrated I/O attachments/adapters are provided for controlling the designated I/O devices. They are designed to interact with their respective I/O devices and should be installed/removed with them since the system is inoperative with only the attachment/adaptor installed.

Direct Disk Attachment (standard) -- Attaches either the 3340 mdl A2 or the 3333 mdl 1 dual disk drive and control unit directly to the 3125. The attachment supports block multiplexing. Channel address is 1, physical drive addresses are 160 to 167 on the first string and 168 to 16F on the second string. For logical address assignment for 3344 refer to the Functional Characteristics manual, GA33-1506.

3333/3330 DASD Subsystem ... one 3333 mdl 1 and one additional 3330 mdl 1 or 2 can be attached to provide up to four spindles.

3340 DASF Subsystem ... on the 3125-0 one 3340 mdl A2 and up to three 3340 mdl B1/B2s can be attached to provide up to eight spindles. On the 3125-2 (with 16 Drive Expansion #9315) one or two 3340 mdl A2s can be directly attached with up to three 3340 mdl B1/B2s attached to each 3340 mdl A2 to provide up to sixteen spindles on the system.

3340/3344 DAS Subsystem ... On the 3125-2 with 3344 Attachment #9317 installed: One 3340 mdl A2 and any combination of up to three 3340 mdl B1/B2s and 3344 mdl B2/B2Fs can be attached on the first string. In addition, on the 3125-2, one 3340 mdl A2 and up to three 3340 mdl B1/B2s can be attached on the second string to provide up to 16 physical or the equivalent of up to 34 logical spindles on the system.

Magnetic Tape Adapter (optional) -- This feature attaches one of the following tape control units and is addressed as channel 2.

3411 Magnetic Tape Unit and Control mdl 1 (20KB) housing one magnetic tape drive. Up to three 3410 Magnetic Tape Unit mdl 1s can be attached to the 3411 mdl 1.

3411 Magnetic Tape Unit and Control mdl 2 (40KB) housing one magnetic tape drive. Up to five 3410 Magnetic Tape Unit mdl 2s can be attached to the 3411 mdl 2.

3411 Magnetic Tape Unit and Control mdl 3 (80KB) housing one magnetic tape drive. Up to five 3410 Magnetic Tape Unit mdl 3s can be attached to the 3411 mdl 3.

3803 Tape Control mdl 3. Up to eight 3420 mdl 3 (120KB) or mdl 5 (200KB) may be attached to the 3803.

Integrated Card I/O Attachments (optional) -- These features provide native attachment of one of the following:

- 3504 Card Reader mdl A1 or A2
- 3525 Card Punch mdl P1, P2 or P3
- 2560 Multi-function Card Machine mdl A1
- 5425 Multi-function Card Unit mdl A1 or A2
- 3504 Card Reader mdl A1 or A2 and 3525 Card Punch mdl P1, P2 or P3
- 3504 Card Reader mdl A1 or A2 and 2560 MFCM mdl A1
- 3504 Card Reader mdl A1 or A2 and 5425 MFCU mdl A1 or A2

The Integrated Card I/O Attachment uses channel 0. Device address X'00C' is reserved for the 3504 Card Reader and device address X'00D' is reserved for the 2560, 3525 or 5425.

Integrated Printer Attachment (optional) -- Attachment features for the 1403 Printer mdl 2, 7 or N1 and for the 3203 Printer mdl 1 or 2 are available. Only one printer unit can be natively attached. The printer adapter is addressed as channel 0 and the device address is X'00E'. The Universal Character Set feature can be optionally selected for the 1403 mdl 2 or N1 on the 3125 at no charge.

Integrated Console Printer Attachment (optional) -- attaches the 5213 Printer mdl 1 to the 3125 to provide hardcopy of operator messages presented on the standard Display Operator Console. It uses address X'01F' (same as the Display Operator Console) on channel 0. When the 1052 Compatibility feature is installed, the 5213 Printer mdl 1 is required.

Integrated Communications Adapter (ICA) (optional) -- Provides the basic control storage and common circuits for direct attachment of up to six synchronous (BSC) communications lines OR up to sixteen asynchronous (start/stop) lines. The **Integrated Communications Adapter Extension (ICAE) (#4641)** adds the capability to attach up to six BSC AND up to sixteen start/stop lines. IBM line adapters are provided within the 3125.

Input/Output Channel

Byte Multiplexer Channel (optional) -- A wide variety of I/O devices may be attached to S/370 mdl 125 via the optional byte Multiplexer Channel. One channel is available on the 3125 as a special feature and is functionally equivalent to the byte multiplexer channel on S/360 mdls 22, 25, 30 and 40. Thirty-two subchannels are provided as standard ... eight channels may be shared and twenty-four are unshared. The byte Multiplexer Channel provides eight control unit positions and permits I/O units to operate normally in byte mode, giving the effect of several I/O operations simultaneous with computing. In burst mode, the channel handles one high speed unit with a maximum data rate of 29 KB per second. It is capable of sustained data rates up to 25 KB per second in byte mode. It is addressed as channel 0. For OS exclusions, refer to SRL GC28-6554, "System/360 Operating Systems System Generation."

Console Function -- System control functions are provided by the standard integrated Video/Display Keyboard. It has the switches and lights necessary to operate and control the system. Optionally, the 5213 mdl 1 console printer (85 cps) may be attached via special feature #4692. The optional 1052 Compatibility feature (#8005) operates the 5213 Printer mdl 1 and standard system's keyboard as an operator console in S/360-1052 mode only. In this mode of operation the Video/Display-Keyboard acts as a slave unit to the printer.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Cabling: #9080 for below the floor, or #9081 for on the floor.

[4] CPU Configuration: #9091 for Configuration 1 (CPU located behind console table), or #9092 for Configuration 2 (CPU bolted to right side of console table). Configuration 2 excludes a 5425 MFCU from being natively attached. See S/370 Installation Manual for details.

[5] Minimum Configuration: See "Minimum Configuration" in "Systems" for minimum I/O units required in a S/370 mdl 125.

[6] DASD Attachment: Specify one -- #9313 for 3333 Attachment, or #9314 for 3340 Attachment or for 3340/3344 Attachment (3125-2 only). Specify Fixed Head Attachment (#9190) if Fixed Head Feature is installed on the 3340 Series drives. NOTE: The Fixed Head Attachment Feature (#9190) cannot be installed with 2311 Mdl 1/3340-Series Compatibility (#8060) or 2314/3340-Series Compatibility (#8070).

[7] Specify #9315 (3125-2 only) for String Switch Capability/16-Drive Expansion if String Switch (#8150) is installed on one or both 3340 mdl A2s, or if a second 3340 mdl A2 is installed no matter how many drives there are (16-Drive Expansion). Specify #9306 Second String if two 3340 mdl A2s are installed. #9315 requires 4K DASF Control Storage Extension (#4210). #9315 cannot be installed with #4105 or #4460 and is mutually exclusive with 3344 Attachment (#9317S).

When String Switch is installed, an Emergency Power Off connection between the sharing systems is mandatory. RPP DC 3621 (two system connection) or DC 3622 (multiple system connection) must be ordered.

The 3125-2 uses fixed addresses 160 to 16F for its attached disk drives. In the case of string switch, to avoid confusion in Job Control and Operation, the same addresses should be assigned to shared drives on the other system. In the case of 3135, 3135-3, 3138 IFA this requires specify code #9821 on the 3135 providing addresses 160 thru 16F to comply with the fixed addresses of the 3125. If intermixing 3330 and 3340 on the 3135, 3135-3, 3138 (#9315), no string switching is possible.

NOTE: The string switch of the DASD hardware function can be operated with the present DOS/VS standard DASD support. DOS/VS does not support the device reserve/release channel commands for program controlled sharing of attached DASD units. Therefore, it is the user's responsibility by appropriate organization and programming procedures to resolve conflicting references to shared files and insure data integrity. One method for controlling potential conflicts involves the use of operator commands DVC UP/DVC DN. For additional information consult DOS/VS System Management Guide, GC33-5371.

[8] On the 3125-2 ... specify 3344 Attachment (#9317) when 3344 mdl B2/B2Fs are installed. 4K DASF Control Storage Extension is required. Cannot be installed with any of the following: String Switch Capability (#9315) ... 231X/3340 Capability (#8060/#8070) ... S/360 Mdl 20 Compatibility (#7520)

‡ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. ‡290 on purchased machines to include any number of diskette-only changes ordered on same diskette.



3125 Processing Unit (cont'd)

... 1401/1440/1460 Compatibility (#4457) ... 1403/3203 Carriage Control Feature (#4460). Specify #9306 Second String if two 3340 mdl A2s are installed;

[9] Specify #9807 for attachment of the 3803 mdl 3 on the Magnetic Tape Adapter (#4675).

NOTE: RETAIN/370 ... CE access is by phone.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 yr	Purchase	MMMC
3125	FE	\$ 4,285	\$ 3,5	\$129,050	\$382
	G	4,406	4,005	131,400	387
	GE	4,527	4,115	133,750	394
	GF	4,648	4,225	136,100	399
	H	4,890	4,445	140,800	411
	FE2	4,825	4,390	145,300	429
	G2	4,946	4,500	147,650	435
	GE2	5,067	4,610	150,000	440
	GF2	5,188	4,720	152,350	446
	H2	5,430	4,940	157,050	457
	HG2	6,019	5,475	170,350	484
	I2	6,503	5,915	179,750	506

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit Machine Group: A Per Call: 3
Purchase Option: 55%† Useful Life Category: 2 Warranty: A
Model/Feature Additional Charge in lieu of AU Charge: 15%
Termination Charge Months: 6 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Field installable.

Planning for Model Conversions: When a customer requires feature changes and/or memory upgrades in addition to a model upgrade, consolidating the several changes into a single not recommended.

MODEL UPGRADE PURCHASE PRICES (There are no additional installation charges)

From To	G	GE	GF	H
FE	\$2,350	\$4,700	\$7,050	\$11,750
G		2,350	4,700	9,400
GE			2,350	7,050
GF				4,700

From To	FE2	G2	GE2	GF2	H2	HG2	I2
FE	\$16,250	\$18,600	\$20,950	\$23,300	\$28,000	\$41,300	\$50,700
G		16,250	18,600	20,950	25,650	38,950	48,350
GE			16,250	18,600	23,300	36,600	46,000
GF				16,250	20,950	34,250	43,650
H					16,250	29,550	38,950
FE2		\$2,350	\$4,700	\$7,050	\$11,750	\$25,050	\$34,450
G2			2,350	4,700	9,400	22,700	32,100
GE2				2,350	7,050	20,350	29,750
GF2					4,700	18,000	27,400
H2						13,300	22,700
HG2							9,400

SPECIAL FEATURES

EXTERNAL SIGNALS (#3898). Provides six distinct external interrupt lines to request and identify an external interrupt response from the processing unit. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisite:** External devices must meet the interface specifications outlined in S/360 - Direct Control Feature - OEM 1, SRL GA22-6845.

FLOATING POINT, INCLUDING EXTENDED PRECISION FLOATING POINT (#3910). Adds 51 floating point arithmetic instructions. Extended precision floating point provides for the precision of up to 28 hexadecimal digits. **Field Installation:** Yes. **Prerequisite:** See "Control Storage Requirements" under "Highlights."

4K CONTROL STORAGE INCREMENT (#4101, 4102). [3125-0 only] Each adds 4,096 words (22 bits wide) of control storage. Required for some feature combinations ... see "Control Storage Requirements" under "Highlights" for details. #4101 -- for first 4K increment ... #4102 -- for second 4K increment. **Field Installation:** Yes. **Prerequisite:** #4102 requires #4101.

8K CONTROL STORAGE EXTENSION (#4105). [3125-2 only] Adds 8,192 words (22-bits wide) of control storage to the IPU. Required for some feature combinations ... see Chart A. **Limitation:** Cannot be installed with #4210 or specify feature #9315. **Maximum:** One. **Field Installation:** Yes.

4K DASF CONTROL STORAGE EXTENSION (#4210). [3125-2

† Purchase Option is 50% under Term Lease Plan (TLP) ...

only] Adds 4,096 words (22-bits wide) to the DDA control storage for use with either or both the String Switch Capability or 16-Drive Expansion specify feature (#9315) or 3344 Attachment specify feature (#9317). **Limitation:** Cannot be installed with #4105 or #4460. **Maximum:** One. **Field Installation:** Yes.

1401/1440/1460 COMPATIBILITY (#4457). Microprogram controlled feature which, in combination with special software, permits the system to execute 1401/1440/1460 instructions. **Limitations:** Cannot be installed with 3344 Attachment (#9317) or with S/360 Model 20 Compatibility (#7520) unless RPQ No. is installed on the 3125 ... RPQ cannot be installed if the 2311 Mdl 1/3340 or 2314/3340 Compatibility feature (#8060, #8070) is installed. Also note Control Storage requirements in Chart A. **Field Installation:** Yes. **Prerequisite:** See "Control Storage Requirements" under "Highlights" above.

1403/3203 CARRIAGE CONTROL FEATURE (#4460). Allows the 3203 Printer with its tapeless carriage control to emulate the function of a tape controlled carriage and thus run programs written for a 1403 Printer. **Limitations:** The 5203 Printer is not supported by this feature. Cannot be installed with String Switch Capability/16-Drive Expansion specify feature (#9315) or 3344 Attachment specify feature (#9317). **Field Installation:** Yes. **Prerequisite:** 3203 Printer. **Note:** #4460 is not required with DOS/VS Release 31 and subsequent releases.

5425 MULTI-FUNCTION CARD UNIT POWER PREREQUISITE (#4500). Provides the power supply for the 5425 Multi-function Card Unit when no native printer (1403 or 3203) is attached. **Limitation:** Cannot be installed with 1403 Printer/5425 Card Unit Power Prerequisite (#4505). **Maximum:** One. **Field Installation:** Yes.

1403 PRINTER/5425 CARD UNIT POWER PREREQUISITE (#4505). Provides the power supply for the natively attached 1403 Printer with or without a 5425 MFUCU. **Limitation:** Cannot be installed with 5425 Multi-function Card Unit Power Prerequisite (#4500). **Maximum:** One. **Field Installation:** Yes.

INTEGRATED 3203 PRINTER ATTACHMENT (#4650). Control for attaching the 3203 Printer mdl 1 or 2. **Specify:** #9770 for 3203 mdl 1, or #9771 for 3203 mdl 2. **Limitation:** Cannot be installed with Integrated 1403 Printer Attachment (#4662, 4667 or 4668). **Maximum:** One. **Field Installation:** Yes.

INTEGRATED 1403 PRINTER MDL 2 ATTACHMENT (#4662). Provides control for attaching the 1403 Printer mdl 2. **Specify:** #9847 to support UCS (#8641) on the 1403 mdl 2. **Limitation:** Cannot be installed with Integrated 3203 Printer Attachment (#4650). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Integrated 1403 Printer Attachment (#4667) and its prerequisite (#4505).

INTEGRATED 1403 PRINTER ATTACHMENT (#4667). Control for attaching the 1403 Printer mdl 7. Prerequisite feature required for installation of the Integrated 1403 Printer Mdl 2 or Mdl N1 Attachment (#4662, #4668). **Limitation:** Cannot be installed with Integrated 3203 Printer Attachment (#4650). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** 1403 Printer/5425 Card Unit Power Prerequisite (#4505).

INTEGRATED 1403 PRINTER MDL N1 ATTACHMENT (#4668). Control for attaching the 1403 Printer mdl N1. **Specify:** #9847 to support UCS (#8640) on the 1403 mdl N1. **Limitation:** Cannot be installed with Integrated 3203 Printer Attachment (#4650). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Integrated 1403 Printer Mdl 2 Attachment (#4662) and its prerequisites (#4667, #4505).

INTEGRATED 2560 MDL A1 ATTACHMENT (#4670). Control for the 2560 Multi-function Card Machine mdl A1. **Limitation:** Cannot be installed with Integrated 3525 Card Punch Attachment (#4685) or with Integrated 5425 Attachment (#4695). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** #9726 on the 2560 mdl A1 ... see "Specify" under 2560.

2560 CARD PRINT CONTROL (#4674). Provides control for Card Print capability on the 2560 MFCM mdl A1. **Specify:** #9797 for first two print lines, #9798 for second two print lines, #9799 for third two print lines, when corresponding Card Print (#1575, 1576, 1577) features are installed on the 2560 mdl A1. **Field Installation:** Yes. **Prerequisite:** Integrated 2560 Mdl A1 Attachment (#4670).

MAGNETIC TAPE ADAPTER (#4675). Provides control for attachment of one 3411 Magnetic Tape Unit and Control mdl 1, 2 or 3 or one 3803 Tape Control mdl 3. See 3420 and 3803 or 3411 and 3410 for additional ordering instructions. The Magnetic Tape Adapter is addressed as channel 2. See "Highlights" for additional information. **Maximum:** One. **Specify:** #9807 for attachment of 3803 mdl 3. **Field Installation:** Yes. **Limitation:** A 3803 and

‡ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

**3125 Processing Unit (cont'd)**

3411 cannot coexist on the Magnetic Tape Adapter. **Prerequisites:** S/370 Mdl 115/125 Attachment (#7361) on the 3411, except for 3125 mdls HG2 and I2. When attached to 3125 mdl HG2 or I2, RPQ is required on the 3411.

INTEGRATED 3504 CARD READER ATTACHMENT (#4680). Control for attaching the 3504 Card Reader mdl A1 or A2. Supports Read Column Eliminate capability on the 3504 Card Reader. **Specify:** #9781 for 3504 mdl A1, or #9782 for 3504 mdl A2; #9783 provides Optical Mark Read capability on the 3125 when Optical Mark Read (#5450) is installed on the 3504 mdl A1 or A2; #9784 provides the capability of using the Selective Stacker (#6555) feature on the 3504 mdl A1 or A2. **Maximum:** One. **Field Installation:** Yes.

INTEGRATED 3525 CARD PUNCH ATTACHMENT (#4685). Control for attaching the 3525 Card Punch mdl P1, P2 or P3. **Specify:** #9791 for 3525 mdl P1, #9792 for 3525 mdl P2, or #9793 for 3525 mdl P3. **Specify** #9794 when the Card Read (#1533) feature is installed on the 3525. **Limitation:** Cannot be installed with Integrated 2560 Mdl A1 Attachment (#4670) or Integrated 5425 Attachment (#4695). **Maximum:** One. **Field Installation:** Yes.

INTEGRATED 5213 PRINTER MDL 1 ATTACHMENT (#4692). Attaches the 5213 Printer mdl 1. Includes a special table to support the Printer. **Maximum:** One. **Field Installation:** Yes.

3525 CARD PRINT CONTROL (#4693). Provides control for Card Print (#8339, #5273) capability on the 3525 Card Punch. **Specify:** #9795 when Two-line Card Print (#8339) is installed on the 3525, or #9796 when Multiline Card Print (#5273) is installed on the 3525. **Field Installation:** Yes. **Prerequisite:** Integrated 3525 Card Punch Attachment (#4685).

INTEGRATED 5425 ATTACHMENT (#4695). Control for attaching the 5425 Multi-function Card Unit mdl A1 or A2. **Specify:** #9183 for 5425 mdl A1 or #9184 for 5425 mdl A2. **Limitations:** Cannot be installed with Integrated 3525 Card Punch Attachment (#4685) or with Integrated 2560 Mdl A1 Attachment (#4670). Can only be installed with CPU Configuration 1 (#9091) ... see "Specify" above. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** 1403 Printer/5425 Card Unit Power Prerequisite (#4505) required when 1403 is natively attached, or 5425 Multi-function Card Unit Power Prerequisite (#4500) if no native printer (1403 or 3203) is configured. When 3203 Printer is attached, #4500 or #4505 is not required.

BYTE MULTIPLEXER CHANNEL (#5248). To attach low speed byte multiplex devices. See "Byte Multiplexer Channel" under "Input/Output Channel" in "Highlights" section. #5248 includes control storage necessary for IOP operation. **Maximum:** One. **Field Installation:** Yes.

S/360 MODEL 20 COMPATIBILITY (#7520). Microprogram controlled program which, in combination with special software, permits the system to execute S/360 mdl 20 instructions. **Limitations:** Cannot be installed with 3344 Attachment (#9317) or with 1401/1440/1460 Compatibility (#4457) unless RPQ is installed on the 3125 ... RPQ cannot be installed if either 2311 Mdl 1/3340 or 2314/3340 compatibility feature (#8060, #8070) is installed. Also note control storage requirements in Chart A. **Field Installation:** Yes. **Prerequisites:** See "Control Storage Requirements" under "Highlights" above.

1052 COMPATIBILITY (#8005). Operates the 5213 Printer mdl 1 and standard keyboard as an operator console in S/360-1052 mode only. In this emulation mode of operation the Video/Display acts as a slave unit to the printer. **Field Installation:** Yes. **Prerequisites:** Integrated 5213 Printer Mdl 1 Attachment (#4692) and the 5213 Printer mdl 1.

2311 MDL 1/3330 - SERIES COMPATIBILITY (#8040). Permits the emulation of 2311 mdl 1 files on the 3333/3330 Disk Storage. The user program may access both the emulated 2311 mdl 1 data set as well as the native data set. This provides a "mixed-mode" operating environment. **Prerequisites:** Minimum of one 4K Increment of Control Storage (#4101, #4102) ... see "Control Storage Requirements" under "Highlights" above. **Note:** When running DOS Release 21-27, 1052 Compatibility (#8005) is a prerequisite. The 1403/3203 Carriage Control Feature (#4460) is also required if a 3203 Printer is attached. Emulation under DOS/VS requires SYSRES on 3330 in native mode. **Field Installation:** Yes. **Limitation:** #8040, #8060 and #8070 are mutually exclusive.

2311 MDL 1/3340 - SERIES COMPATIBILITY (#8060). Permits the emulation of 2311 mdl 1 files on the 3340 Disk Storage. The user program may access both the emulated 2311 mdl 1 data as well as the native data set. This provides a "mixed-mode" operating environment. **Prerequisites:** Minimum of one 4K Increment of Control Storage (#4101, #4102) ... see "Control Storage

Requirements" under "Highlights" above. **Note:** When running DOS Release 21-27, 1052 Compatibility (#8005) is a prerequisite. The 1403/3203 Carriage Control Feature (#4460) is also required if a 3203 Printer is attached. Emulation under DOS/VS requires SYSRES on 3340. **Field Installation:** Yes. **Limitations:** Cannot be installed with 3344 Attachment (#9317) ... #8040, #8060, #8070 and #9190 are mutually exclusive.

2314/3340 - SERIES COMPATIBILITY (#8070). Permits the emulation of 2314 files on the 3340 Disk Storage. The user program may access both the emulated 2314 data set as well as the native data set. This provides a "mixed-mode" operating environment. **Prerequisites:** Minimum of one 4K Increment of Control Storage (#4101, #4102) ... also see "Control Storage Requirements" under "Highlights" above. **Note:** When running DOS Release 21-27, 1052 Compatibility (#8005) is a prerequisite. The 1403/3203 Carriage Control Feature (#4460) is also required if a 3203 Printer is attached. Emulation under DOS/VS requires SYSRES on 3340 in native mode. **Field Installation:** Yes. **Limitations:** Cannot be installed with 3344 Attachment (#9317) ... #8040, #8060, #8070 and #9190 are mutually exclusive.

COMMUNICATIONS FEATURES

INTEGRATED COMMUNICATIONS ADAPTER (ICA) (#4640). Provides the basic control storage and common circuits for direct attachment of up to six synchronous (BSC) communications lines OR up to sixteen asynchronous (start/stop) communications lines depending upon line speed. All combinations of BSC AND start/stop require the Integrated Communications Adapter Extension (#4641). Additional features are required to create appropriate line interfaces for the individual lines. Figure 1A schematically represents the feature build-up. The ICA provides as standard:

- | | |
|--|--------------------|
| - Autopoll | Start/Stop and BSC |
| - Multipoint central station functions | Start/Stop and BSC |
| - Multipoint tributary station functions | BSC only |
| - EBCDIC transparent mode | BSC only |
| - EBCDIC or ASCII code | BSC only |

Refer to Figures 2A and 2B for attachable terminals and for configuration requirements prior to ordering features below.

Note:

to assist in configuring the ICA (refer to *ICA Configurator Manual*, GA33-1508).

Customer Responsibilities -- see M 2700 pages for customer responsibilities regarding communications facilities and services. **Communications Facilities** -- see M 2700 pages for communications facility requirements with this feature. **Maximum:** One. **Field Installation:** Yes.

INTEGRATED COMMUNICATIONS ADAPTER EXTENSION (ICAE) (#4641). This feature is required for all combinations of BSC and start/stop lines. Extends the communications capability to up to six BSC AND sixteen start/stop lines depending upon line speed. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ICA (#4640).

ASYNCHRONOUS LINE GROUP 1 (ALG1) (#1201). Permits attachment of up to four medium speed asynchronous lines (AL) (#1231) or up to four low speed asynchronous line pairs (ALP) (#1241) or up to four telegraph line pairs (TLP) (#7881). ALG1 and ALG2 are identical in function and either one can be installed as the first line group in the ICA. The lines within ALG1, positions A1 thru A4, must be installed in ascending order. **Limitation:** All lines within ALG1 must have the same line speed and line control. Different terminals using the same speed and line control can be attached within one line group. See Figure 2A. **Specify:** One line control specify code from Figure 2A. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ICA (#4640).

ASYNCHRONOUS LINE GROUP 2 (ALG2) (#1202). Permits attachment of up to four medium speed asynchronous lines (AL) (#1232) or up to four low speed asynchronous line pairs (ALP) (#1242) or up to four telegraph line pairs (TLP) (#7882). ALG1 and ALG2 are identical in function and either one can be installed as the first line group in the ICA. The lines within ALG2, positions A5 thru A8, must be installed in ascending order. **Limitation:** All lines in ALG2 must have the same line speed and line control. Different terminals using the same line speed and line control can be attached within one line group. See Figure 2A. **Specify:** One line control specify code from Figure 2A. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ICA (#4640).

ASYNCHRONOUS LINE, MEDIUM SPEED (AL) (#1231 in ALG1, #1232 in ALG2). Provides for the attachment of one non-switched 600 bps start/stop communications line. The 3767 can be attached to this feature (at EC 380427 plus EC 380627) via

‡ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

**3125 Processing Unit (cont'd)**

switched or non-switched lines at 300 bps and via non-switched lines at 600 or 1200 bps. Clocking speed is selected at installation time. Connects to the line via a modem or IBM Line Adapter. The lines are installed in ascending order, A1 thru A4 in ALG1 and A5 thru A8 in ALG2. **Note:** IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. **Maximum:** Four each of #1231 and #1232. **Field Installation:** Yes. **Prerequisites:** ALG1 (#1201) is prerequisite to #1231; ALG2 (#1202) is prerequisite to #1232. **Limitations:** See Figure 5, Maximum ICA Configuration. #1231, #1241 and #7881 cannot be intermixed within ALG1. #1232, #1242 and #7882 cannot be intermixed within ALG2.

ASYNCHRONOUS LINE PAIR, LOW SPEED (ALP) (#1241 in ALG1, #1242 in ALG2). Provides for the attachment of two switched 110.0 bps or two switched or non-switched 134.5 bps start/stop communications lines. Connects to the line via a modem or IBM Line Adapter. The lines are installed in ascending order, A1 thru A4 in ALG1 and A5 thru A8 in ALG2. **Note:** IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. **Limitations:** See Figure 5, Maximum ICA Configuration. #1231, #1241 and #7881 cannot be intermixed within ALG1. #1232, #1242 and #7882 cannot be intermixed within ALG2. **Maximum:** Four each of #1241 and #1242. **Field Installation:** Yes. **Prerequisites:** ALG1 (#1201) is prerequisite to #1241, and ALG2 (#1202) is prerequisite to #1242.

AUTO CALL ADAPTER (ACA) (#1291-1296). Provides automatic dialing capabilities on switched facilities. One of these features is required for each line equipped to automatically originate calls on switched networks. See Figure 3 for the selection of correct feature code. **Limitations:** The use of Auto Call in a line group precludes the last two lines/line pairs of that group ... see Figure 3. **Maximum:** Two per line group ... maximum total six. **Field Installation:** Yes. **Prerequisite:** See Figure 3.

IBM LEASED LINE ADAPTER (#4743). A modem for start/stop data transmission at 134.5 or 600 bps over non-switched facilities. This line adapter operates with Leased Line Adapters on other IBM products. Selection between 2-wire and 4-wire operation is made at installation time. See Leased Line Adapter in SRL GA24-3435 for specifications and restrictions. **Specify:** See Figures 4C and 4D. **Maximum:** See Figures 4C and 4D. **Field Installation:** Yes. **Prerequisites:** Line Adapter Base, #4792 or #4793. Also see Figures 4C and 4D.

IBM 1200 BPS LINE ADAPTER (#4781, #4782, #4791). A modem for BSC data transmission at up to 1200 bps over non-switched facilities or switched network. Also for start/stop transmission at 300, 600 or 1200 bps over non-switched facilities to the 3767 terminal. Unclocked and must interface to a SLC (#7141-7144) or AL (#1231).

The IBM 1200 bps Line Adapter is available in three different versions:

- #4781 -- Non-switched
- #4782 -- Switched with Autoanswer
- #4791 -- Switched with Autocall and Autoanswer

Attachment to non-switched facilities is via an IBM provided cable directly to the line. Attachment to the switched network is via an IBM provided cable to a common carrier arrangement type CBS or equivalent. **Customer Responsibilities** -- see M 2700 pages. **Communications Facilities** -- see M 2700 pages. **Specify:** See Figures 4C and 4D. **Maximum:** See Figures 4C and 4D. **Field Installation:** Yes. **Prerequisites:** SLC (#7141-7144) or AL (#1231) and a Line Adapter Base (#4792 or #4793). Also see Figures 4C and 4D. ACA (#1295 or #1296) is prerequisite for #4791.

LINE ADAPTER BASE 2 (LAB 2) (#4792). Permits attachment of up to two IBM 1200 bps Line Adapters for BSC lines and up to four IBM Leased Line Adapters. The line adapters are tied to specific line positions. See Figure 4C for configuration and possible line combinations. **Note:** LAB 2 is required for IBM 1200 bps Line Adapters with Autoanswer (#4782) or with Autocall and Autoanswer (#4791). **Limitation:** #4792 and #4793 are mutually exclusive. **Maximum:** One. **Field Installation:** Yes.

LINE ADAPTER BASE 3 (LAB 3) (#4793). Permits attachment of up to twelve IBM 1200 bps Line Adapters and IBM Leased Line Adapters. The line adapters are tied to specific line positions. See Figure 4D for configuration and possible line combinations. **Limitation:** #4792 and #4793 are mutually exclusive. **Maximum:** One. **Field Installation:** Yes.

SYNCHRONOUS LINE GROUP (SLG) (#7100). Permits attachment of up to four medium speed BSC lines -- SLC (#7141-7144) and SL (#7151-7154). Maximum line speed is 7200 bps. The lines in this group, positions S1 thru S4, must be installed in ascending order. The lines can have different line speeds within the maximum specified. **Specify:** Maximum line speed in the group:

Max. Line Speed	Specify Code
1200 bps	#9751‡
2400 bps	#9753‡
4800 bps	#9754‡
7200 bps	#9757‡

Maximum: One. **Field Installation:** Yes. **Prerequisite:** ICA (#4640).

SYNCHRONOUS LINE, HIGH SPEED (SLHS) (#7121). Provides for the attachment of one non-switched BSC line at speeds up to 50.0 kbps. See Figure 1. This is a digital current interface for attachment to an E1, E2 or E3 facility. **Note:** Only for non-switched point-to-point lines. **Limitations:** See Figure 5, Maximum ICA Configuration. #7121 and #7131 are mutually exclusive. This line has a load factor of 100% and must not be operated concurrently with any other line in the ICA. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ICA (#4640).

SYNCHRONOUS LINE, LOW LOAD (SLLL) (#7131 - First Line, #7132 - Second Line). Each provides for the attachment of one switched or non-switched BSC line. Non-switched lines with switched network backup are supported.

Maximum line speed on non-switched lines is 7200 bps. Maximum line speed on switched backup network is 3600 bps. Maximum line speed on switched network is 2400 bps. See Figure 2B for detailed speed and facility information.

Requires external modem. This feature has a lower load factor than #7151-7154 ... see Figure 5. The modem must provide clocking.

Specify: The highest line speed used on #7131 and #7132:

- #9758 if the highest line speed is from 1200 bps up to 4800 bps.
- #9759 if the highest line speed is above 4800 bps and up to 7200 bps.

Note: 1200 bps is the LOWEST allowed line speed for these features. SLG (#7100) not required as a prerequisite. **Limitations:** See Figure 5, Maximum ICA Configuration ... #7131 and #7121 are mutually exclusive. **Maximum:** One each, #7131 and #7132. **Field Installation:** Yes. **Prerequisites:** ICA (#4640) ... #7132 requires #7131 or #7121.

SYNCHRONOUS LINE, MEDIUM SPEED WITH CLOCK (SLC) (#7141-7144).

- #7141 -- Line position S1
- #7142 -- Line position S2
- #7143 -- Line position S3
- #7144 -- Line position S4

Line positions S1 thru S4 must be installed in ascending order.

Each feature provides for the attachment of one switched or non-switched BSC line. The clock can be set by the user for a transmission rate of 600 bps or 1200 bps. Connects to the line via an unclocked modem or IBM Line Adapter. [**Notes:** IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. SL (#7151-7154) may be intermixed with SLC (#7141-7144) within the SLG.] **Limitations:** See Figure 5, Maximum ICA Configuration. #7141 is mutually exclusive with #7151, #7142 with #7152, #7143 with #7153, and #7144 with #7154. **Maximum:** One each, #7141 thru #7144. **Field Installation:** Yes. **Prerequisite:** SLG (#7100).

SYNCHRONOUS LINE, MEDIUM SPEED (SL) (#7151-7154).

- #7151 -- Line position S1
- #7152 -- Line position S2
- #7153 -- Line position S3
- #7154 -- Line position S4

Line positions S1 thru S4 must be installed in ascending order.

Each feature provides for the attachment of one switched or non-switched BSC line. Non-switched lines with switched network backup are supported.

Maximum line speed on non-switched lines is 7200 bps. Maximum line speed on switched backup network is 3600 bps. Maximum line speed on switched network is 4800 bps. See Figure 2B for detailed speed and facility information.

Connects to the line via a modem. The modem must provide clocking. **Note:** SL (#7151-7154) may be intermixed with SLC (#7141-7144) within the SLG. **Limitations:** See Figure 5, Maximum ICA Configuration. #7151 is mutually exclusive with #7141, #7152 with #7142, #7153 with #7143, and #7154 with #7144. **Maximum:** One each, #7151 thru #7154. **Field Installation:** Yes. **Prerequisite:** SLG (#7100).

TELEGRAPH LINE PAIR (TLP) (#7881 in ALG1, #7882 in ALG2).

‡ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.



3125 Processing Unit (cont'd)

Provides for the attachment of two non-switched single current telegraph lines at 45.5, 56.9, 74.2 or 75 bps. Attachment to the lines is via an IBM provided external cable. The lines, A1 thru A4 in ALG1 and A5 thru A8 in ALG2, are installed in ascending order. **Limitations:** See Figure 5, Maximum ICA Configuration. #1231, #1241 and #7881 cannot be intermixed within ALG1. #1232, #1242 and #7882 cannot be intermixed within ALG2. **Maximum:** Four each, #7881 and #7882. **Field Installation:** Yes. **Prerequisite:** ALG1 (#1201) is prerequisite to #7881; ALG2 (#1202) is prerequisite to #7882.

MODEMS One IBM modem can be attached to each of the BSC lines of the ICA (#4640). **Prerequisite:** SL (#7151-7154) or SLLL (#7131, #7132).

Modem	Speed (bps)
3863	2400/1200
3872	2400/1200
3864	4800/2400
3874	4800/2400
3875	7200/3600/1800

Note: For communications capabilities, product utilization and special features, see 3863, 3864, 3872, 3874, 3875 and M 2700 pages.

Special Feature Prices: TLP/MAC/MLC MRC 4 yr Purch MMMC

3125-0 and 3125-2

External Signals	#3898*	\$112	\$102\$	4,200	\$ 1.00
Fltg Pt Includ Ext Precision	3910	NC	NC	**	NC
1401/1440/1460 Compat	4457	NC	NC	**	NC
1403/3203 Carr Cntrl Feature	4460	NC	NC	**	NC
5425 MFCU Power Prereq	4500	179	163	6,715	14.00
1403/5425 Cd Unit Pwr Prereq	4505	313	285	11,730	39.00
Int 3203 Prntr Attachment	4650*	173	158	5,205	16.50
Int 1403 Prntr Mdl 2 Attach	4662*	10	10	434	1.00
Int 1403 Prntr Attachment	4667*	145	132	5,455	12.00
Int 1403 Prntr Mdl N1 Attach	4668*	5	5	217	1.00
Int 2560 Mdl A1 Attachment	4670*	156	142	5,890	12.00
2560 Card Print Control	4674*	33	30	1,250	2.00
Magnetic Tape Adapter	4675*	112	102	4,200	3.50
Int 3504 Card Reader Attach	4680*	72	66	2,730	8.50
Int 3525 Card Punch Attach	4685*	89	81	3,375	11.00
Int 5213 Prntr Mdl 1 Attach	4692*	112	102	4,200	3.50
3525 Card Print Control	4693*	67	61	2,510	3.00
Int 5425 Attachment	4695*	156	142	5,890	21.00
Byte Multiplexer Channel	5248*	224	204	8,405	24.00
S/360 Mdl 20 Compatibility	7520	NC	NC	**	NC
1052 Compatibility	8005	NC	NC	**	NC
2311 Mdl 1/3330-Series Cmpt	8040	NC	NC	**	NC
2311 Mdl 1/3340-Series Cmpt	8060	NC	NC	**	NC
2314/3340-Series Cmpt	8070	NC	NC	**	NC

Communications Features

Int Communications Adapter	4640*	230	210	8,585	27.50
Int Comm Adapter Extension	4641*	84	77	3,160	1.50
Asynchronous Line Group 1	1201*	43	40	1,685	3.50
Asynchronous Line Group 2	1202*	43	40	1,685	3.50
Async Line, Med Spd - ALG1	1231*	43	40	1,685	3.00
Async Line, Med Spd - ALG2	1232*	43	40	1,685	3.00
Async Line Pr, Low Spd-ALG1	1241*	61	56	2,295	4.00
Async Line Pr, Low Spd-ALG2	1242*	61	56	2,295	4.00
Auto Call Adapter -					
line position A1	1291*	21	20	824	1.50
line position A2	1292*	21	20	824	1.50
line position A5	1293*	21	20	824	1.50
line position A6	1294*	21	20	824	1.50
line position S1	1295*	21	20	824	1.50
line position S2	1296*	21	20	824	1.50
IBM Leased Line Adapter	4743*	15	14	424	3.00
IBM 1200 BPS Line Adapter -					
non-switched	4781*	16	15	535	3.00
switched w autoanswer	4782*	21	20	714	3.50
sw w autoans & autocall	4791*	72	66	1,970	12.00
Line Adapter Base 2	4792*	28	26	1,035	2.00
Line Adapter Base 3	4793*	28	26	1,035	2.00
Synchronous Line Group	7100*	43	40	1,685	3.50
Synchronous Line, High Speed	7121*	112	102	4,200	9.00
Synchronous Line, Low Load -					
first line	7131*	112	102	4,200	9.00
second line	7132*	112	102	4,200	9.00
Sync Line, Med Spd w Clock -					
line position S1	7141*	61	56	2,295	4.00
line position S2	7142*	61	56	2,295	4.00
line position S3	7143*	61	56	2,295	4.00
line position S4	7144*	61	56	2,295	4.00
Sync Line, Med Spd -					
line position S1	7151*	49	45	1,905	3.50
line position S2	7152*	49	45	1,905	3.50
line position S3	7153*	49	45	1,905	3.50
line position S4	7154*	49	45	1,905	3.50
Telegraph Line Pair - ALG1	7881*	61	56	2,295	9.50
Telegraph Line Pair - ALG2	7882*	61	56	2,295	9.50

3125-0 Only

4K Control Storage Increment					
first	4101	55	50	1,335	1.50
second	4102	55	50	1,335	1.50

3125-2 Only

8K Control Storage Extension	4105	110	100	2,670	3.50
4K DASF Control Storage Ext	4210	55	50	1,335	1.50

* Feature supplies CPU diskette.

** CPU diskette-only feature. No fee when ordered at time of manufacture or when field installed. \$290 on purchased machines when combined with changes subject to a distribution fee to include any number of diskette-only changes ordered on the same diskette.



3125 Processing Unit (cont'd)

FIGURE 1A
INTEGRATED COMMUNICATIONS ADAPTER SCHEMATIC
FEATURE BUILD-UP

ICAE (#4641)	LINE GROUP	LINE INTERFACES	Async Line Position	Sync Line Position	
ICA (#4640)	ALG 1 (#1201)	AL (#1231), or ALP (#1241), or TLP (#7881)	A1		
		AL (#1231), or ALP (#1241), or TLP (#7881)	A2		
		AL (#1231), or ALP (#1241), or TLP (#7881)	A3 (1)		
		AL (#1231), or ALP (#1241), or TLP (#7881)	A4 (1)		
	ALG 2 (#1202)	AL (#1232), or ALP (#1242), or TLP (#7882)	A5		
		AL (#1232), or ALP (#1242), or TLP (#7882)	A6		
		AL (#1232), or ALP (#1242), or TLP (#7882)	A7 (1)		
		AL (#1232), or ALP (#1242), or TLP (#7882)	A8 (1)		
	SLG (#7100)	SL (#7151), or SLC (#7141)			S1
		SL (#7152), or SLC (#7142)			S2
		SL (#7153), or SLC (#7143)			S3 (1)
		SL (#7154), or SLC (#7144)			S4 (1)
	SLL (#7132)	SLLL (#7131), or SLHS (#7121)			S5
		SLLL (#7132)			S6

(1) Auto Call Adapters (#1291-1296) restrict the use of these line positions ... see Figure 3.

FIGURE 2A
START/STOP TERMINALS

TERMINAL	SPEED (bps)	FACILITIES	ALG 1		ALG 2	
			LINE INTER-FACE	LINE CNTRL SPECIFY	LINE INTER-FACE	LINE CNTRL SPECIFY
1030	600.0	D2	1231	9740¢	1232	9750¢
1050	75.0	A4	7881	9736¢	7882	9746¢
	134.5	C1, C2, D1	1241	9738¢	1242	9748¢
1060	134.5	D1	1241	9738¢	1242	9748¢
2740 mdl 1	134.5	C1, C2, D1	1241	9738¢	1242	9748¢
2740 mdl 2	75.0	A4	7881	9736¢	7882	9746¢
	134.5	D1	1241	9738¢	1242	9748¢
	600.0	D2	1231	9739¢	1232	9749¢
2741	134.5	C1, C2, D1	1241	9738¢	1242	9748¢
3767 mdl 1, 2 w #7111 or #7113	300.0	C1, D1	1231	9739¢	1232	9749¢
3767 mdl 1, 2, 3 w #7112	600 or 1200	D2	1231	9739¢	1232	9749¢
5010 mdl Axx	134.5	C1, C2, D1	1241	9738¢	1242	9748¢
	600.0	D2	1231	9739¢	1232	9749¢
5100/5110	134.5	B1, B2, C1, C2, D1	1241	9738¢	1242	9748¢
	300.0	C1, D1	1231	9739¢	1232	9749¢
	45.5	A1	7881	9733¢	7882	9743¢
AT&T 83B2/83B3 WU 115A	56.9	A2	7881	9734¢	7882	9744¢
	74.2	A3	7881	9735¢	7882	9745¢
TWX-33/35	110.0	C3	1241	9737¢	1242	9747¢

¢ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

FIGURE 2B
BINARY SYNCHRONOUS TERMINALS

SPEED (bps)	LINE INTERFACE	FACILITIES	S/370 mdl 115 w (4640)	Another S/370 mdl 125 w (4640)	S/370 mdl 135, 135-3, 138 w (4640)	2701	2703	3704/3705	S/360 mdl 20 w (2074)	S/360 mdl 25 w (4580)	System/3 w (2074)	1131 w (2074)	1826 w (7550)	2715 mdl 2	2772	2780	3271	3275	3651 mdl A60 or B60	3661 **	3735	3741-2/3747	3771, 3773, 3774, 3775	3776	3777	3780	5110	5231 mdl 2	5275 **	System/7 w (2074)	S/32 w (2074) and S/34 w (2500)	Series/1	3684	4331 w (1601)			
600	7141-7144	C3	X	X	X			X		X																										X	
1200	7141-7144	C4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
1200	7141-7144	D3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2400	7151-7154	C5																																			X
2400	7151-7154	D4, X1M ††	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2400/1200	7151-7154	D4SB	X	X		X	X	X	X	X	X				X	X							X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4800	7151-7154 or 7131/7132	D5, X2M †††	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4800/2400	7151-7154	C6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4800/2400	7151-7154	D5SB	X	X		X	X	X	X	X	X				X	X							X	X	X	X	X	X	X	X	X	X	X	X	X	X	
7200/3600	7151-7152 or 7131/7132	D6	X	X	X	X	X	X	X	X	X				X	X	X	X						X	X					X	X	X	X	X	X	X	
7200/3600 & 1800	7151-7152 or 7131/7132	D6SB	X	X		X	X	X	X	X	X				X	X	X	X						X	X					X						X	
19,200	7121	E1	X	X		X	X	X	X	X																										X	
40,800	7121	E2	X	X		X	X	X	X	X																										X	
50,000	7121	E3	X	X		X	X	X	X	X																										X	

** 3125 ICA must use the IBM 1200 bps Modem (#4781 or #4782).

†† X1M may not be used for communications with a 2703 or a S/360 mdl 25.
††† X2M may not be used for communications with a 2703 or a S/360 mdl 25.



3125 Processing Unit (cont'd)

FIGURE 3

AUTO CALL ADAPTERS

AUTO CALL ADAPTER FEATURE CODE	PROVIDES AUTO CALL FOR LINE POSITION	PREREQUISITES	PRECLUDES LINE POSITIONS
1291	A1 (1)	1241	A3 and A4
1292	A2 (1)	1241 and 1291	A3 and A4
1293	A5 (1)	1242	A7 and A8
1294	A6 (1)	1242 and 1293	A7 and A8
1295	S1	7141 or 7151	S3 and S4
1296	S2	7142 or 7152 and 1295	S3 and S4

(1) Provides Autocall in this line position for the first line of the Asynchronous Line Pair (#1241 or #1242).

FIGURE 4A

IBM LINE ADAPTERS

FACILITY	BSC	START/STOP up to 600 bps	Start/Stop (2) up to 1200 bps
	IBM 1200 bps Line Adapter	IBM Leased Line Adapter	IBM 1200 bps Line Adapter
Non-switched pt-to-pt	4781	4743	4781
Non-switched multipoint control	4781	4743	4781
Non-switched multipoint tributary	4781	---	---
Switched with autoanswer	4782	---	---
Switched with autocall and autoanswer	4791	---	---

(2) Only with 3767 terminal.

FIGURE 4C

LINE ADAPTER BASE 2 (#4792) ... Maximum, 6 IBM Line Adapters.

LINE POSITION	LINE ADAPTER	LINE ADAPTER POSITION SPECIFY	PREREQ	NOTE
A5 1st line	4743	9463¢	1242	
A5 2nd line	4743	9464¢	9463	
A6 1st line	4743	9465¢	1242	
A6 2nd line	4743	9466¢	9465	
S1	4781	9471¢	7141	Select one line adapter
	4782	9473¢	7141	
	4791	9475¢	7141	
S2	4781	9472¢	7142	Select one line adapter
	4782	9474¢	7142	
	4791	9476¢	7142	

FIGURE 4D

LINE ADAPTER BASE 3 (#4793) ... Maximum, 12 IBM Line Adapters.

LINE POSITION	LINE ADAPTER	LINE ADAPTER POSITION SPECIFY	PREREQ	NOTE
A1 (3)	4743 or 4781	9481, 9501 ¢	1231	Excludes line adapter in position S4 (#9496)
A2 (3)	4743 or 4781	9482, 9502 ¢	1231	Excludes line adapter in position S3 (#9495)
A3 (3)	4743 or 4781	9483, 9503 ¢	1231	Excludes line adapter in position S2 (#9494)
A4 (3)	4743 or 4781	9484, 9504 ¢	1231	Excludes line adapter in position S1 (#9493)
A5 1st line	4743	9485¢	1242	
A5 2nd line	4743	9486¢	9485	
A6 1st line	4743	9487¢	1242	
A6 2nd line	4743	9488¢	9487	
A7 1st line	4743	9489¢	1242	
A7 2nd line	4743	9490¢	9489	
A8 1st line	4743	9491¢	1242	
A8 2nd line	4743	9492¢	9491	
S1	4781	9493¢	7141	Excludes line adapter in position A4 (#9484)
S2	4781	9494¢	7142	Excludes line adapter in position A3 (#9483)
S3	4781	9495¢	7143	Excludes line adapter in position A2 (#9482)
S4	4781	9496¢	7144	Excludes line adapter in position A1 (#9481)

(3) #4781 may be used only with the 3767 terminal.

FIGURE 5

MAXIMUM ICA CONFIGURATION

All lines/line pairs are assigned load factors. The sum of all load factors must not exceed 100% if SLHS is not installed.

The sum of all load factors must not exceed 200% if SLHS is installed.

ASYNCHRONOUS LINES	LOAD FACTOR IN %			
	1-2 line pairs	3-4 line pairs	5-6 line pairs	7-8 line pairs
TLP at 45.5 and 56.9 bps TLP at 74.2 and 75.0 bps ALP at 110.0 and 134.5 bps	20%	20%	40%	40%
	20	40	60	80
	20	40	60	80
AL at 300/600/1200 bps	First Line Group (ALG) Up to 4 lines		Second Line Group ALG1 + ALG2 5 to 8 lines	
	20		40	
SYNCHRONOUS LINES	1-2 lines		3-4 lines	
SL and SLC at max. 1200 bps SL and SLC at max. 2400 bps SL at max. 4800 bps SL at max. 7200 bps	Autopoll Not Used	Autopoll Used	Autopoll Not Used	Autopoll Used
	20	25	20	25
	20	25	40	50
	40	50	80	100
	60	75		
SLLL at max. 4800 bps SLLL at max. 7200 bps SLHS at max. 50 kbps	1 line		2 lines	
	Autopoll Not Used	Autopoll Used	Autopoll Not Used	Autopoll Used
	20	25	20	30
	20	30	40	60
	100*			

* See "Limitations" in the Special Feature description of the feature.

¢ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.



IBM 3135 PROCESSING UNIT

Purpose: Has main and control storage, plus arithmetic and logic circuits for a S/370 mdl 135.

Model FE	98,304 bytes of processor storage.
Model GD	147,456 bytes of processor storage.
Model GF	196,608 bytes of processor storage.
Model H	262,144 bytes of processor storage.
Model HF	327,680 bytes of processor storage.
Model HG	393,216 bytes of processor storage.
Model I	524,288 bytes of processor storage.

For additional models of the 3135, see 3135-3 "Machines" pages.

Highlights: Depending upon the model, up to 524,288 bytes of processor storage are available. CPU cycle time varies from 275 to 1485 nanoseconds depending on the internal operation being performed. Sixteen general purpose and four floating point registers are provided.

Capability to natively attach a 2319 Disk Storage mdl A1** (and additional 2319 mdl A3**, 2312** or 2318** Disk Storage). Capability to natively attach one or two 3333 Disk Storage and Control modules. Capability to natively attach one or two 3340 Direct Access Storage Facility mdl A2s. Capability to natively attach a 1403 Printer mdl 2, 7 or N1. See "Special Features."

Virtual Storage capability to increase the effective utilization of main storage.

Up to eight teleprocessing lines are attachable via the Integrated Communications Adapter (#4640).

Standard features include a commercial instruction set, new S/370 instructions, Extended Control (EC) Mode, Dynamic Address Translation, Channel Indirect Data Addressing, Program Event Recording, interval timer, time-of-day clock, store and fetch protect, console file, byte-oriented operand feature, error checking and correction on main and control storage, automatic instruction retry, channel command retry, byte multiplexer channel, OS/DOS Compatibility Feature, and audible alarm.

A standard console file is the basic microprogram loading device for the system. The console file contains a small, low performance read only file device that provides all the microcode for the system on removable magnetic disk cartridges. The disks that will be supplied with the system will contain all of the required microcode for the basic system, the optional features ordered for the system, and FE diagnostics.

An optional Clock Comparator and Timer provides additional timing facilities for the programmer.

Control Storage Requirements -- Reloadable Control Storage is housed in the 3135, and is loaded from the console file. 24,576 bytes of control storage are standard ... two additional increments of 12,288 bytes are available if required to support special features.

TABLE OF CONTROL STORAGE REQUIREMENTS	BYTES
Basic Systems Microcode	15,482
APL Assist (#1005)	13,800
Conditional Swapping (#1051)	300
Autocall (#1290) *	440
Block Multiplexer Channel (#1421)	1,568
Block Multiplexer Shared Subchannel (#1431)	14
Clock Comparator and CPU Timer (#2001)	1,400
Direct Control (#3274)	50
Extended Precision Floating Point (#3840)	676
Floating Point (#3900)	1,200
64 Multiplexer Subchannels (#3905)	1,024
128 Multiplexer Subchannels (#3906)	2,048
256 Multiplexer Subchannels (#3907)	4,096
1401/1440/1460 Compatibility (#4457)	3,492
Integrated Communications Adapter (#4640)	2,100
IFA Conversion Feature (#4645)	2,048
2319 Integrated File Adapter (#4650)	4,652
3333/3340 Series IFA (#4655) with:	
#9313	10,192
#9314	9,768
#9315	12,800
#9316 ***	300
#9317 ++	2,200
String Switch Attachment (#9841) with:	
#9313	300
#9314	370
#9315	334
#9316 ***	0
Fixed Head Attachment (#9190) with:	
#9314	300
#9315	300

TABLE OF CONTROL STORAGE REQUIREMENTS (cont'd) BYTES

Integrated Printer Adapter Basic Control (#4670)	1,300
Integrated 1403 Printer mdl 2, mdl N1 Attachment (#4672)	0
Integrated 1403 Printer mdl 7 Attachment (#4677)	0
First or First and Second Selector Channel (#6981,6982)	1,584
S/360 Mdl 20 Compatibility (#7520)	876
3210 Model 1 Adapter (#7844)	1,494
3215 Adapter (#7855)	1,930
Virtual Machine Assist (#8740)	2,000
Synchronous Data Adapter Type II (#9649-9656) *	3,700
Adapter Base Type I +*	1,200
Terminal Adapter Type I Model II (#9721-9728) +*	500
Telegraph Adapter Type II (#9785-9792) +*	200
Terminal Adapter Type III (#9753-9760) *	2,100
2314/3340 Series Compatibility (#8070)	6,400

For the basic system and applicable special features, total the control storage requirements given in the table. If the total exceeds 24,576 bytes, First 12K Control Storage Increment (#7861) is required. If the total exceeds 36,864 bytes, Second 12K Control Storage Increment (#7862) is also required.

Limitations: The maximum configuration that can operate at any one time is determined by the available control storage (maximum 49,152 bytes). Alternate feature configurations can be operated by utilizing additional magnetic disk cartridges with another set of 3135 features. Alternate cartridges for an installation will be available by RFQ.

Virtual Storage: Extended Control (EC) Mode expands the structure of the Program Status Word to accommodate the control of new S/370 features and extends the number of permanently assigned main storage locations. The S/370 mdl 135 can operate in either EC Mode or Basic Control (BC) Mode as defined for the S/360. Dynamic Address Translation (DAT) is a standard feature on the S/370 mdl 135. When the S/370 mdl 135 is in Extended Control (EC) Mode with Translation Mode operable, program addresses are treated as "logical addresses" and the translation feature develops "real addresses." Since logical storage addressing is not limited by the amount of available real storage, program size may exceed real storage size. This logical storage is referred to as "virtual storage" and may be as large as 16,777,216 bytes on the S/370 mdl 135. For I/O operations, Channel Indirect Data Addressing provides a means to transmit data that spans pages in noncontiguous real storage.

Program Event Recording, a standard feature, is a debugging aid which permits four types of events to be selectively monitored in a virtual environment: [1] Successful branches ... [2] Instruction fetch address compare ... [3] Main Storage alteration address compare ... [4] General Purpose Register alteration address compare.

Input/Output Attachments -- a wide variety of I/O devices may be attached to the S/370 mdl 135 via the standard byte multiplexer and optional selector channels. There are additionally, five direct attachment features for the 3135. They are:

Console Printer-Keyboard (Required) -- this unit serves as the on-line I/O device for operator/system communications. It provides a means of manually entering data into the system, altering or displaying data already in storage, and for printing error logout messages.

2319 Integrated File Adapter (#4650) (Optional) -- this feature enables native attachment of a 2319 Disk Storage mdl A1** (and a 2319 mdl A3**, 2312 mdl A1s** or 2318 mdl A1**) up to a total of eight drives. The IFA is addressed as channel 1. **LIMITATION:** Cannot be installed if 3333/3340 Interfix (#9315) is specified when 3330/3340 Series IFA (#4655) is also ordered.

3330/3340 Series Integrated File Adapter (#4655) (Optional) -- this feature allows the native attachment of one or two 3333 modules or 3340 mdl A2 units. Each 3333 module (either mdl 1 or mdl 11) can attach up to three 3330 modules (any combination of mdls 1, 2 or 11). Each 3340 mdl A2 can attach 3340 mdl B2 or B1 units and one 3340 mdl A2 can also attach 3344 units to a maximum of eight drives. Maximum is sixteen drives per IFA. If 2319 IFA (#4650) is also present, IFA Conversion Feature (#4645) is required.

Integrated Communications Adapter (Optional) -- this feature provides attachment of up to eight teleprocessing lines to the 3135. These may be any combination of supported BSC and Start/Stop lines and appear to the processor as if connected via one or more 2701s on the byte multiplexer channel.

Integrated Printer Adapter (Optional) -- this feature enables

* The specified control storage is required once only for any number of lines of one type.

+ For Telegraph Adapter Type II or Terminal Adapter Type I Model II, the control storage required is the Adapter Base Type I plus the control storage for the appropriate adapter. One copy of Adapter Base Type I is automatically included whenever either or both of these adapters are ordered.

++ Requires #9314.

** No longer available.

*** Requires either #9313 or #9315.

3135 Processing Unit (cont'd)

native attachment of a 1403 Printer mdl 2, 7 or N1. The Universal Character Set Feature can be optionally specified on the 1403 mdl 2 or N1.

Input/Output Channels

Byte Multiplexer Channel -- one is standard on the 3135 and is functionally equivalent to the byte multiplexer channel on S/360 mdls 22, 25, 30, 40, 50. Sixteen subchannels are provided as standard with the option to extend to 64, 128 or 256 ... see "Special Features." From the number of subchannels chosen, one must be allocated to the Console Printer-Keyboard (see "Specify"), and one for each ICA line installed. The byte multiplexer channel provides eight control unit positions and permits I/O units to operate normally in byte mode, giving the effect of several I/O operations simultaneous with computing. Burst mode operation of unbuffered devices operating in excess of 10KB is not allowed for concurrent operation with the Integrated File Adapter, the Integrated Communications Adapter, or a Selector Channel. For further clarification refer to IBM S/370 Model 135 Channel Characteristics Manual, GA33-3010. For OS exclusion, refer to SRL GC28-6554, "System Generation."

Selector Channels -- two are available as special features. Data rates are 1.3 megabytes per second.

Direct access devices may be attached to selector channels and/or to the Integrated File Adapters. If either or both the 2319 IFA and the 3330/3340 Series IFA is present, the following applies:

- Direct access devices should be attached to the higher priority selector channel (normally the first).
- If the device on the higher priority selector channel is the 3330 or 3340 Disk Storage series, the lower priority selector channel should be limited to devices with data rates not exceeding 144KB per second.
- The selector channel priorities for command chaining may be reversed by specifying Channel Priority (#1501).

If the 3330/3340 Series IFA, or both IFAs, are present without additional direct access devices attached via a selector channel, tape units on selector channels 2 and 3 are limited to an aggregate 950 KB.

If an IFA is not present, two channels of 3330 Series, 3340 Series, and/or 3350 Series DASD can be attached. For additional information and limitations, see S/370 Model 135 Channel Characteristics, GA33-3010.

Console Function -- a standard system control panel is located on the 3135. It has switches and lights necessary to operate and control the system. A system console I/O function is provided with either of two alternatives. Feature #7844 attaches the 3210 Console Printer-Keyboard mdl 1 (15.5 cps) on the console table reading board. Optionally, the 3215 Console Printer-Keyboard (85 cps) may be attached via feature #7855. A right reading board extension is standard on the 3135 ... a left extension is not available. Either feature #7844 or #7855 is required in the system ... see "Special Features."

PREREQUISITES: Each 3135 requires a 3046 Power Unit ... see 3046.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

- [2] Cabling: #9080 for below the floor, or #9081 for on the floor.
- [3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- [4] Console Printer-Keyboard Address: Recorded on console file disk at the plant. #9101 for X'01F', or #9102 for X'009'.
- [5] Minimum Configuration: See "Minimum Configurations" in "Systems" for minimum I/O units required in a S/370 mdl 135.
- [6] Console Printer-Keyboard: A 3210 mdl 1 or 3215 is required in every system ... see 3210, 3215 and "Special Features" below.
- [7] Shipping Instructions: Unless otherwise specified, shipping dimensions of the 3135 Frame 01 (CPU) are 31-1/2" wide x 70" long x 60" high. Removal of the side covers will reduce the width to 29-1/2". If further reduction in length is required, specify #9570. Shipping dimensions will then be 29-1/2" wide x 60" long x 60" high.

NOTE: RETAIN/370 ... CE access is by telephone.

Mdl	MAC/ MRC	TLP/ MLC 4 Year	Purchase	MMMC	
3135	FE	\$6,355	\$5,780	\$252,800	\$497
	GD	7,370	6,705	284,950	529
	GF	8,385	7,630	317,100	560
	H	9,740	8,870	350,550	658
	HF	10,440	9,510	372,450	712
	HG	11,140	10,150	394,350	766
	I	12,540	11,430	438,150	874

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Base Unit Machine Group: A
 Per Call: 3 Purchase Option: 50%† Warranty: A
 Useful Life Category: 2 Termination Charge Months: 6
 Termination Charge Percent: 25% Upper Limit Percent: 5%
 Model/Feature Additional Charge in lieu of AU Charge: 15%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	GD	GF	DH	H	HF	HG	I
FE	\$32,150	\$64,300	\$96,450	\$97,750	\$119,650	\$141,550	\$185,350
GD		32,150	64,300	65,600	87,500	109,400	153,200
GF			32,150	33,450	55,350	77,250	121,050
DH				33,450	55,350	77,250	121,050
H					21,900	43,800	87,600
HF						21,900	65,700
HG							43,800

SPECIAL FEATURES

APL ASSIST (#1005). Provides performance assist to APL programs when used with VS APL PP #5748 AP1. **Field Installation:** Yes. **Prerequisite:** 12K control store increments (#7861 and #7862) and Floating Point (#3900).

CONDITIONAL SWAPPING (#1051). Provides two additional instructions ... Compare and Swap ... Compare Double and Swap. This feature is a prerequisite for the execution of VTAM programming support and for TCAM/NCP. **Field Installation:** Yes.

BLOCK MULTIPLEXER CHANNEL (#1421). Increases the efficiency of the 3330/3340 Series IFA and selector channels when using direct access storage devices equipped with rotational position sensing or other devices capable of disconnected command chaining. The disconnected command chaining feature of the channel allows multiple devices to perform non-data transfer operation concurrently with one data transfer operation. This permits increased utilization of the channel(s) by performing operations of other devices while the channel would normally have been waiting on one device. The feature provides 16 non-shared selector and 1 shared subchannel. The shared selector subchannel may attach a control unit having a maximum of 16 device addresses. Devices on a block multiplexer channel which cannot utilize the block multiplexer feature will function as if attached to a conventional selector channel. **Maximum:** One. Applies to both Selector Channels and the 3330/3340 Series IFA. **Field Installation:** Yes. **Prerequisites:** First Selector Channel (#6981) or 3330/3340 Series IFA (#4655).

BLOCK MULTIPLEXER SHARED SUBCHANNEL (#1431). **Note:** This feature should only be installed if devices capable of "Block Shared" operation are installed on the block multiplexer channel. See I/O Configuration Form, GA22-7002. Allows any one of the following combinations of "Non-Shared", "Block Shared", or selector subchannels to be attached to the Block Multiplexer Channel (#1421): [1] 16 non-shared and one shared selector (see address restrictions) ... [2] 8 non-shared, 8 block shared, and 1 shared selector (see address restrictions) ... [3] 8 non-shared, 4 block shared, 1 shared selector (see address restrictions). If option [2] is selected, then each block shared subchannel may have attached to it a control unit having a maximum of 16 device addresses. If option [3] is selected, the four block shared subchannels may each have attached a control unit having a maximum of 32 device addresses. If option [1] is selected, no block shared subchannels are available, and addresses X00 through X7F are not available. With any option, the selector subchannel may have attached to it control units with a maximum of 16 device addresses. This feature will apply to both selector channels if installed. The options are selectable by the Customer Engineer and may be defined differently on each channel. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Block Multiplexer Channel (#1421). **Address Restrictions with #1431:**

‡ CPU diskette-only feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette.
 † Purchased machines to include any number of diskette-only changes ordered on same diskette.

† Purchase Option is 50% under Term Lease Plan (TLP)



3135 Processing Unit (cont'd)

- a) Addresses X00 through X7F are assigned as block shared subchannels. With option [1], they may not be used. With option [2], each control unit address position, i.e., X00, X10, X20, etc., through X70 is available. With option [3], "even" control unit address positions only are available, i.e., 00, 20, 40, and 60.
- b) Selector and non-shared addresses are limited to addresses X80 through XFF.

CHANNEL PRIORITY (#1501). When the IFA (#4650 or #4655) and both selector channels are present, this feature changes the higher priority for command chaining from the first selector channel (Channel 2) to the second selector channel (Channel 3). #1501 is required if any DASD devices are to be attached to Channel 3. **Field Installation:** Yes. **Prerequisites:** Integrated File Adapter (#4650 or #4655) and both Selector Channels (#6981 and #6982).

CLOCK COMPARATOR AND CPU TIMER (#2001). The Clock Comparator provides a means of causing an interruption when the time-of-day clock has passed a program-specified value. The CPU Timer is a binary counter which is decremented every microsecond but has a readout resolution of 16 microseconds. It provides a means of measuring elapsed CPU time by causing an interruption when a prespecified amount of time has elapsed. **Maximum:** One. **Field Installation:** Yes.

DIRECT CONTROL (#3274). Provides two instructions, Read Direct and Write Direct, and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in S/360 Direct Control Feature - OEMI, GA22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide a single emergency power-off switch in a "room" or "area," see Emergency Power-Off Control under S/370 mdl 135 in "Systems." #3621 -- to interconnect two emergency power-off switches ... #3622 -- to interconnect up to twelve emergency power-off switches. **Field Installation:** Yes.

EXTENDED PRECISION FLOATING POINT (#3840). Extends the precision of floating point instructions to 28 hexadecimal digits. **Field Installation:** Yes. **Prerequisite:** Floating Point (#3900).

FLOATING POINT (#3900). Adds 44 floating point arithmetic instructions ... these, with the Standard Set, make up the Scientific Instruction Set. **Field Installation:** Yes.

MULTIPLEXER SUBCHANNELS, ADD'L (#3905-3907). To increase the number of I/O devices on the byte multiplexer channel, the number of subchannels can be increased by specifying one of the following: #3905 -- for 64 subchannels ... #3906 -- for 128 subchannels ... #3907 -- for 256 subchannels. The maximum number of shared subchannels is eight. When 256 subchannels are installed there are no shared subchannels. **Note:** The number of subchannels ordered must be equal to or greater than the device addresses. Also see "Byte Multiplexer Channel" under "Input/Output Channels" above. **Field Installation:** Yes.

1401/1440/1460 COMPATIBILITY (#4457). Microprogrammed controlled feature, which, in conjunction with special software, permits the system to execute 1401/1440/1460 instructions. **Field Installation:** Yes.

IFA CONVERSION FEATURE (#4645). Permits co-residence of both 2319 Integrated File Adapter (#4650) and 3330/3340 Series Integrated File Adapter (#4655). Both IFAs are addressed as Channel 1. **Maximum:** One. **Limitations:** Cannot be installed if 3333/3340 Intermix (#9315) or 3344 Attach (#9317) is specified ... cannot be installed with 2314/3340 Compatibility Feature (#8070). **Field Installation:** Yes. **Prerequisites:** 2319 Integrated File Adapter (#4650) and 3330/3340 Series IFA (#4655).

2319 INTEGRATED FILE ADAPTER (#4650). Permits native attachment of a 2319 mdl A1 (and a 2319 mdl A3, 2312 mdl A1s or 2318 mdl A1) up to a total of 8 drives ... see item [4] under "Ordering Instructions" on the 2319. Standard features include file scan and record overflow functions. The IFA is always addressed as Channel 1. **Maximum:** One. **Limitations:** Cannot be installed if 3333/3340 Intermix (#9315) is specified under 3330/3340 Series IFA (#4655) ... cannot be installed with 2314/3340 Compatibility Feature (#8070). **Field Installation:** Yes. **Prerequisite:** IFA Conversion Feature (#4645) required if installed with 3330/3340 Series IFA (#4655).

3330/3340 SERIES INTEGRATED FILE ADAPTER (#4655). Permits native attachment of up to two 3333s or 3340 mdl A2s. A maximum of sixteen 3330 or 3340 series drives can be attached to the IFA. The IFA supports rotational position sensing, disconnected command chaining and multiple requesting if the Block

Multiplexer Channel (#1421) is installed. Record overflow is standard. For 3330, standard I/O addresses are (hex) 150 thru 15F. For 3340, standard addresses are (hex) 1C0 thru 1CF. For 3340 with 3344, standard addresses are (hex) 1C0 thru 1E1. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** IFA Conversion Feature (#4645) is required if installed with 2319 IFA (#4650).

Specify: [1] DASD Designation -- Specify ONE of the following -- #9313 (DASD 3333/3330) to attach up to two 3333 mdl 1s, each with up to three 3330 mdls 1/2 in any combination ... #9314 (DASD 3340 Only) to attach up to two 3340 mdl A2s, each with up to three 3340 mdls B1/B2 in any combination ... #9315 (3333/3340 Intermix) to attach one 3333 mdl 1 (with up to three 3330 mdls 1/2 in any combination) plus one 3340 mdl A2 (with up to three 3340 mdls B1/B2 in any combination). #9315 cannot be installed with IFA Conversion Feature (#4645).

[2] If any 3333 mdl 11 and/or 3330 mdl 11 is to be attached, also specify #9316 (3333/3330 mdl 11) in addition to #9313 or #9315.

With #9313 plus #9316, a mixture of one 3333 mdl 1 and one 3333 mdl 11, each with up to three 3330 mdls 1, 2 and 11 (in any combination) can be attached ... or two 3333 mdl 11s, each with any mixture of up to three 3330 mdls 1, 2 and 11.

With #9315 plus #9316, one 3333 (either mdl 1 or mdl 11) with up to three 3330 mdls 1, 2 and 11 (in any combination) can be attached in addition to one 3340 mdl A2 with up to three associated mdls B1/B2. The standard addresses with #9315 for 3330 are (HEX) 150 thru 157, for 3340 (HEX) 158 thru 15F.

[3] If any 3344 is to be attached, specify #9317 in addition to #9314 (#9317 and #9315 are mutually exclusive). #9190 must also be specified if 3344 mdl B2Fs or the 3340 Fixed Head Feature (#4301/4302) is ordered.

With #9314, #9317, and #9190 up to three 3344 mdl B2/B2F and/or 3340 mdl B2, B1 units in any combination can be attached to one 3340 mdl A2. The second 3340 mdl A2 if present can attach up to three 3340 mdl B1/B2 units.

#9317 is mutually exclusive with IFA Conversion Feature (#4645) and with 2314/3340 Compatibility Feature (#8070).

[4] When #9314 is specified, also specify 3340 Address Designation: #9820 for addresses (HEX) 1C0 thru 1CF, or #9821 for addresses (HEX) 160 thru 16F. The specification of 160 allows the 3135 IFA addresses to coincide with those of the 3115 and 3125 IFAs.

[5] When #9314 or #9315 is specified, also specify #9190 (Fixed Head Attachment) if Fixed Head Feature (#4301/4302) is ordered for any 3340 attached to the IFA.

[6] If String Switch (#8150) is ordered for any attached 3333 or 3340 mdl A2, specify String Switch Attachment (#9841).

[7] When #9821 is specified in conjunction with #9313 the addresses for the 3333/3330s are (HEX) 160 thru 16F.

[8] When #9821 is specified and both #9314 and #9317 are specified the addresses for the 3340/3344s are as follows:

		3340 A2		--- 3344 B2/B3Fs ---											
String 0		160	161	162	163	164	165	166	167	172	173	174	175	176	177
				1E2	1E3	1E4	1E5	1E6	1E7	1F2	1F3	1F4	1F5	1F6	1F7
Physical Drive		0	1	2	3	4	5	6	7						
		3340 A2		--- 3340 B2s ---											
String 1		168	169	16A	16B	16C	16D	16E	16F						

Note: The DASD control combinations that can be attached to the 3330/3340 Series IFA (#4655) are shown in the left hand column of the table below. From Section A of the table select one of the feature numbers shown (one and only one must be selected). From Section B select the feature number(s) required to support your configuration (select none, one or more than one from Section B). Section C of the table shows the addresses available. The specification of the (HEX) 160 addresses allows the 3135 IFA addresses to coincide with those of the 3115 and 3125 IFA. Select a number from Section C if required.

§ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.



3135 Processing Unit (cont'd)

	SECTION A					SECTION B					SECTION C	
	DASD Designation, one req'd	If any 3333 Mdl 11 and/or 3330 Mdl 11	3344	3344 Mdl B2F	Fixed Head Feature (#4301/4302) on 3340	String Switch #8150 on 3333/ 3340	2314/ 3340 Compatibility Feature (see #8070)	3330/3340 Supports RPS Disconnected CMMD Chaining Multiple Requesting if BLK MPX #1421 installed	2319 IFA (#4650)	ADDRESSES		
DASD Control Combinations on IFA (#4655)									Standard	Address 160		
3333 Disk Storage Control	9313 \$	9316\$	--	--	--	9841 \$	--	1421	4645	* HEX 150-15F	9821 \$ HEX 160-16F	
3333/3340 Inter-mix	9315 \$	9316 \$	--	--	9190 \$	9841 \$	--	1421	--	*3330 HEX 150-157 3340 HEX 158-15F	--	
3340 Direct Access Storage Facility	9314 \$	--	9317 \$	9317 \$ + 9190 \$	9190 \$	9841 \$	** 8070	1421	*** 4645	9820 \$ Not 3344 HEX 1C0-1CF 3344 HEX 1C0-1E1	9821 \$ Not 3344 HEX 160-16F See Item 8 above	

- * No feature number required.
- ** Mutually exclusive with String Switch #9841, 2319 IFA (#4650), IFA Conversion feature (#4645), 3344 Attachment (#9317).
- *** Mutually exclusive with 3344 Attachment (#9317) and 2314/3340 Compatibility (#8070).

INTEGRATED PRINTER ADAPTER BASIC CONTROL (#4670). Provides the power supply and basic control for a natively attached 1403 Printer. The standard address is "00E". **Specify: #9485** if optional address of "00F" is desired. **Maximum:** One. **Field Installation:** Yes. **Note:** If the optional address of "01F" for the Console Printer Keyboard (#3210 or #3215) and "00F" for the integrated 1403 are both used, Multiplexer Subchannels, Add'l (#3905) must be specified.

INTEGRATED 1403 PRINTER MDL 2, MDL N1 ATTACHMENT (#4672). Provides control for attaching 1403 mdl 2 or N1. **Specify: #9182** to attach 1403 mdl 2, #9188 to attach 1403 mdl N1. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Integrated Printer Adapter Basic Control (#4670). On the 1403, Voltage Adapter (#9709) and 600 LPM Voltage Conversion Adapter (#9725) are required on a mdl 2; 1100 LPM Voltage Conversion Adapter (#9726) is required on a mdl N1. See Specify under 1403.

INTEGRATED 1403 PRINTER MDL 7 ATTACHMENT (#4677). Provides control for attaching a 1403 mdl 7. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Integrated Printer Adapter Basic Control (#4670). On the 1403, 600 LPM Voltage Conversion Adapter (#9725) is required on a mdl 7. See Specify under 1403.

SELECTOR CHANNEL (#6981, 6982). Each adds a high-speed channel to the system. The channel permits overlapped I/O operation with processing. Eight control unit positions are provided on each channel. If an Integrated File Adapter (#4650 or #4655) is present, these channels are addressed as 2 and 3 respectively. Otherwise, they are addressed as 1 and 2. **#6981** -- for first selector channel ... **#6982** -- for second. **Field Installation:** Yes. **Prerequisite:** #6982 requires #6981.

S/360 MODEL 20 COMPATIBILITY (#7520). Microprogrammed controlled feature which, in combination with special software, permits the system to execute S/360 mdl 20 or S/360 mdl 25 in mdl 20 mode instructions. **Field Installation:** Yes.

3210 MDL 1 ADAPTER (#7844). To attach a 3210 Console Printer-Keyboard mdl 1 (15.5 cps) for systems console I/O ... includes an alter-display ability. **Maximum:** One. **Limitation:** Cannot be installed with 3215 Adapter (#7855). **Field Installation:** Yes. **Prerequisite:** Uses one address on the standard byte multiplexer channel, but does not use a control unit position. See "Specify." Can be field changed to 3215 Adapter (#7855) ... See RPQ

3215 ADAPTER (#7855). To attach a 3215 Console Printer-Keyboard (85 cps) for systems console I/O ... includes alter-display ability. **Maximum:** One. **Limitation:** Cannot be installed with 3210 Mdl 1 Adapter (#7844). **Field Installation:** Yes. **Prerequisite:** Uses one address on the standard byte multiplexer channel, but does not use a control unit position. See "Specify."

12K CONTROL STORAGE INCREMENTS (#7861, 7862). Each adds 12,288 bytes of control storage. Required for some feature combinations ... see "Control Storage Requirements" under "Highlights" for details. **#7861** -- for first 12K increment ... **#7862** -- for second. **Field Installation:** Yes. **Prerequisite:** #7862 requires #7861.

2314/3340 COMPATIBILITY FEATURE (#8070). Permits the emulation of 2314/2319 volumes on the 3340 Disk Storage. The user program may access both the emulated 2314 data set as well as 3340 volumes. This provides a "mixed-mode" operating environment. "Mixed-mode" is only possible with DOS releases which

support 3340 on the mdl 135. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with IFA Conversion Feature (#4645), 2319 IFA (#4650), 3333/3340 Inter-mix (#9315), 3344 Attach (#9317), or String Switch Attachment (#9841). **Prerequisite:** #9314 on 3330/3340 Series IFA (#4655).

UNIVERSAL CHARACTER SET ADAPTER (#8637). Permits the use of the Universal Character Set feature on a 1403 mdl 2 or N1 attached via the Integrated 1403 Printer mdl 2, mdl N1 Attachment (#4672). **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Integrated Printer Adapter Basic Control (#4670), Integrated 1403 Printer mdl 2, mdl N1 Attachment (#4672).

VIRTUAL MACHINE ASSIST (#8740). Provides assist to VS operating systems operating under VM/370 by emulation of certain privileged operations. **Field Installation:** Yes. **Prerequisites:** Clock Comparator and CPU Timer (#2001) and Floating Point (#3900).

INTEGRATED COMMUNICATIONS ADAPTER (#4640). Provides the circuits and controls for direct attachment of up to eight teleprocessing lines to the 3135. The controls for the first line adapter are included in this feature. Lines can be any combination of Start/Stop or BSC. Provides for the attachment of 1050, 2260 mdl 1, 2260 mdl 2, 2265 mdl 1, 2740 mdl 1, 2740 mdl 2, 2741 mdl 1, 2760 mdl 1, 5010 Axx, or any IBM computer, multiplexer or terminal conforming to the Binary Synchronous Communications (BSC) standard. **Note:** In addition to the appropriate adapter, each communications line attached to the system requires an external modem.

Refer to **Table 2** below to define customer configuration requirements prior to ordering features below. **Customer Responsibilities** -- see M 2700 pages for customer responsibilities regarding communications facilities and servicing requirements. **Communications Facilities** -- see M 2700 pages for communications facility requirements with this feature. **Field Installation:** Yes.

AUTOCALL (#1290). Provides automatic calling capabilities on facilities C1, C2, C4 or C5 to initiate (dial) through stored program control, a data link to a remote station. For the appropriate automatic calling units, see M 2700 pages. **Specify:** Refer to **Table 1-C** for Terminal Adapter Type I Model II or **Table 1-E** for Synchronous Data Adapter Type II or **Table 1-F** for Telegraph Adapter Type II for appropriate feature code according to line positions desired. **Maximum:** Four. **Limitations:** Each Autocall feature installed reduces the number of lines available on the ICA by one. Autocall must be ordered once for each line where the function is desired. Thus, the ICA can accommodate a maximum of four lines if each of these lines also has the Autocall feature. A single Autocall feature can be associated with any of the lines from one to seven. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** Terminal Adapter Type I Model II (#9721-9728) or Synchronous Data Adapter Type II (#9649-9656) or Telegraph Adapter Type II (#9785-9792) and Switched Network Facility (#9625-9632).

ADDITIONAL LINES (#4722 - 4728). Each provides circuits and controls for attachment of an additional line adapter ... for a total of eight lines in a system. **Specify:** Order additional lines according to line position required ... see **Table 1-A** below. Each line specified requires the next lower order line as a prerequisite. **Maximum:** One of each (#4722 thru #4728). **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

SPECIFY REQUIREMENTS FOR INTEGRATED COMMUNICATIONS ADAPTER For each line (#4722-4728) attached to the ICA, including the first line included in #4640, one of the following line adapters must be specified: Terminal Adapter Type I Model II (#9721-9728), Terminal Adapter Type III (#9753-9760), Tele-

\$ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

**3135 Processing Unit (cont'd)**

graph Adapter Type II (#9785-9792), or Synchronous Data Adapter Type II (#9649-9656). Each line adapter and all associated features must be specified according to the line position to which they correspond. Refer to **Table 2** below prior to ordering features for the ICA.

TERMINAL ADAPTER TYPE I MODEL II (#9721-9728). Controls data transfers between the 3135 and 1050/2740 mdl 1/2741/5010 mdl Axx over facility C1 or D1, and between the 3135 and 2740 mdl 2 or 5010 mdl Axx over facility D1 or D2. Includes vertical and longitudinal checking for 1050 terminals and 2740s equipped with Record Checking (#6114). **Specify:** Refer to **Table 1-B** for appropriate feature code according to line position(s) desired. **Special Requirements:** See **Table 1-C** and features below for additional specify requirements if Switched Network Facility, Write Interrupt, Unit Exception Suppression, Read Interrupt, or Autocall are required. Normal operation is at 134.5 bps. 600 Bits per Second feature must be specified for operation at 600 bps to 2740s or 5010 mdl Axx. **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

300 BITS PER SECOND (#9593-9600). Allows the Terminal Adapter Type I Model II to operate at 300 bps. **Specify:** Refer to **Table 1-C** for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II.

Type I Model II or the Synchronous Data Adapter Type II to operate at 600 bps. **Specify:** Refer to **Table 1-C** for Terminal Adapter Type I Model II or **Table 1-E** for Synchronous Data Adapter Type II for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II, or Synchronous Data Adapter Type II.

SWITCHED NETWORK FACILITY (#9625-9632). Allows the Terminal Adapter Type I Model II, Synchronous Data Adapter Type II, or Telegraph Adapter Type II to operate over C type switched lines. **Specify:** Refer to **Table 1-C** for Terminal Adapter Type I Model II, **Table 1-E** for Synchronous Data Adapter Type II or **Table 1-F** for Telegraph Adapter Type II for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II, Synchronous Data Adapter Type II, or Telegraph Adapter Type II.

WRITE INTERRUPT (#9745-9752). Allows the Terminal Adapter Type I Model II to operate with a 2741 equipped with Receive Interrupt (#4708). Not supported under BTAM, QTAM or TCAM. **Specify:** Refer to **Table 1-C** for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II.

Model II to operate with a 2741 equipped with Transmit Interrupt (#7900). Not supported under BTAM, QTAM or TCAM. **Specify:** Refer to **Table 1-C** for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II.

UNIT EXCEPTION SUPPRESSION (#9729-9736). If this feature is installed with Terminal Adapter Type I Model II, Unit Exception will not be set in response to a Circle C. Not supported under BTAM, QTAM or TCAM. **Specify:** Refer to **Table 1-C** for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II.

TERMINAL ADAPTER TYPE III (#9753-9760). Controls data transfers between the 3135 and either remote 2845 Display Controls or 2848 Display Controls operating at 1200 bps over facility D3. Permits operation at 2400 bps over facility D4 if Modem Clocking is specified. **Specify:** Refer to **Table 1-B** for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

MULTIPOINT (#9761-9768). Specifies that a Terminal Adapter Type III is to operate in multipoint mode. If #9761-9768 is not ordered for a given Terminal Adapter Type III, point-to-point operation is presumed. **Specify:** Refer to **Table 1-D** for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type III.

MODEM CLOCKING (#9609-9616). Allows a Terminal Adapter Type III to operate at 2400 bps or a Synchronous Data Adapter Type II to operate at 2000 bps, 2400 bps, 4800 bps or 7200 bps. Requires the appropriate clocking to be in the attached modem. **Note:** Certain modems such as the IBM 3863 mdl 1 or 3872 mdl 1 although basically 2400 bps modems, offer a 1200 bps half speed facility. Since the requirements for the Modem Clocking feature are defined by the type of modem, not the line speed, when such modems are attached to the Synchronous Data Adapter Type II and are switched for 1200 bps operation, Modem Clocking is still required as a prerequisite on the ICA. **Specify:** Refer to **Table 1-D** for Terminal Adapter Type III or **Table 1-E** for Synchronous Data Adapter Type II for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type III or Synchronous Data Adapter Type II.

NEW SYNC (#9808-9815). Allows the Synchronous Data Adapter Type II or Terminal Adapter Type III to be connected to modems which offer the New Sync feature option and have this option installed. New Sync feature minimizes modem turnaround and allows faster bit synchronization of the following data. **Specify:** Refer to **Table 1-D** for Terminal Adapter Type III, or **Table 1-E** for Synchronous Data Adapter Type II for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisites:** Modem Clocking (#9609-9616), and a modem offering New Sync. **Note:** New Sync is NOT required if Half Duplex Facility (#9617-9624), Tributary Station (#9665-9672), or Switched Network (#9625-9632) is installed for the line position in question.

TELEGRAPH ADAPTER TYPE II (#9785-9792). Controls data transfers between ICA and Model 33/35 TTY terminals (8 level code at 110 bps only) with facility C2. **Specify:** Refer to **Table 1-B** for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisites:** Integrated Communications Adapter (#4640) and Switched Network Facility (#9625-9632).

SYNCHRONOUS DATA ADAPTER TYPE II (#9649-9656). Provides control of data transfers between the 3135 and binary synchronous terminals. See "Binary Synchronous Terminals" under 2701 Data Adapter Unit. Control Station is included with this feature. **Specify:** Refer to **Table 1-B** for appropriate feature code according to line position(s) desired. **Speed Selection:** Provides operation over C3, D2 and D3 facilities at 600 bps if 600 Bits Per Second feature is specified ... see above. Provides operation over C4 and D3 facilities at 1200 bps (no speed need be specified). Provides operation over C5M facility at 2000 bps if Modem Clocking is specified ... see above. Provides operation over C5, D4 or X1M at 2400 bps, over C6, D5 or X2M at 4800 bps, or over D6 at 7200 bps ... see above. **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

Special Requirements: See **Table 1-E** and features below for additional specify requirements if Half Duplex Facility, Transparency, Tributary Station, Switched Network Facility, Autocall, EON, or New Sync are required. See required. See **Table 1-E** and Modem Clocking above if 2000 bps, 2400 bps, 4800 bps, or 7200 bps operation is required. The appropriate Data Code feature must be specified if other than EBCDIC is required as the primary data code ... see Data Code Features below.

Limitations: For line speed limitations refer to *Model 135 Channel Characteristics Manual GA33-3010*.

HALF DUPLEX FACILITY (#9617-9624). Required if the Synchronous Data Adapter Type II is attached to a two-wire facility. **Note:** This feature is not required with Switched Network (#9625-9632) or Tributary Station (#9665-9672). **Specify:** Refer to **Table 1-E** for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Synchronous Data Adapter Type II.

TRIBUTARY STATION (#9665-9672). Required when a Synchronous Data Adapter Type II is installed and functioning on a leased communications line as a tributary station and not functioning as a control station. **Specify:** Refer to **Table 1-E** for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Synchronous Data Adapter Type II.

DATA CODE FEATURES. The primary data code for the SDA Type II is EBCDIC. As an option to EBCDIC either ASCII or 6-bit Transcode (2780 Data Transmission Terminal only) may be specified as the primary code. In addition to the primary code, an alternate data code, selected under program control, may be specified for the Synchronous Data Adapter Type II. EBCDIC, ASCII or 6-bit Transcode may be selected as an alternate

to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Synchronous Data Adapter Type II.

TRANSPARENCY (#9673-9680). Provides the Synchronous Data Adapter Type II with the ability to transmit and receive 8-bit binary as well as EBCDIC or ASCII codes ... or 6-bit binary data as well as 6-bit Transcode. This feature with ASCII modifies VRC/LRC checking to VRC/CRC checking. **Limitation:** ASCII code and Transparency cannot be installed together for the same line position when attached to the 2770, 2780, 3735, 3780, System/3, System/7, System/32 or System/34. **Specify:** Refer to **Table 1-E** for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Synchronous Data Adapter Type II.

EON (#9801-9807). Automatically generates an EON digit at the end of the dial sequence. **Specify:** Refer to **Table 1-E** for appropriate feature code according to line position(s) desired. **Specify:** for 3872 and 3874 Modem with EON option. **Field Installation:** Yes. **Prerequisites:** Autocall (#1290) ... Synchronous Data Adapter Type II.

§ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.



3135 Processing Unit (cont'd)

MODEMS Up to eight modems can be attached to a 3135, any model. **Prerequisites:** Integrated Communications Adapter (#4640) and Synchronous Data Adapter Type II (#9649-9656) 2400 bps to 7200 bps, Terminal Adapter Type I Model II (#9721-9728) 134.5 bps to 600 bps, or Terminal Adapter Type III (#9753-9760) 1200 bps or 2400 bps. See feature descriptions for limitations.

Modem	Speed (bps)
3863	2400
3872	2400
3864	4800
3874	4800
3875	7200

Note: For communications capabilities, product utilization and special features, see 3863, 3864, 3872, 3874, 3875 and M 2700 pages.

Special Feature Prices:	MAC/ MRC	TLP/ MLC		Purch	MMMC
		4 yr	5 yr		
APL Assist	#1005	NC	NC	**	NC
Conditional Swapping	1051	NC	NC	NC	NC
Autocall	1290*	\$ 56	\$ 51	\$2,180	\$ 1.00
Block Multiplexer Channel	1421	NC	NC	**	NC
Block Mltpr Shared Subchnl	1431	NC	NC	**	NC
Channel Priority	1501	NC	NC	**	NC
Clk Comprt & CPU Timer	2001	NC	NC	**	NC
Direct Control	3274*	131	120	5,205	1.00
Emergency Power-Off Control - for 2 switches	3621	NC	NC	NC	NC
for up to 12 switches	3622	NC	NC	NC	NC
Extrnd Precision Fltng Point	3840*	30	28	1,485	1.00
Floating Point	3900	NC	NC	**	NC
Multiplexer Subchannels, Add'l					
64 subchannels	3905	NC	NC	**	NC
128 subchannels	3906	NC	NC	**	NC
256 subchannels	3907	NC	NC	**	NC
1401/1440/1460 Cmpbtblty	4457	NC	NC	**	NC
Intgrd Comm Adapter	4640*	242	220	9,470	22.50
IFA Conversion Feature	4645	NC	NC	**	NC
2319 Intgrd File Adapter	4650*	515	468	22,740	13.00
3330/3340 Series IFA	4655*	708	644	19,820	3.00
Int Prntr Adptr Basic Cntrl	4670*	400	364	19,850	19.50
Int 1403 Prntr -2,-N1 Attach	4672*	10	10	415	.50
Int 1403 Prntr -7 Attach	4677*	10	10	415	.50
Lines, Additional					
Second	4722*	47	43	1,900	4.50
Third	4723*	95	87	3,815	9.00
Fourth	4724*	47	43	1,900	4.50
Fifth	4725*	144	131	5,690	14.50
Sixth	4726*	47	43	1,900	4.50
Seventh	4727*	47	43	1,900	4.50
Eighth	4728*	47	43	1,900	4.50
Selector Channel - first	6981*	211	192	10,480	4.00
Selector Channel - second	6982*	181	165	8,990	4.00
S/360 Mdl 20 Compatibility	7520	NC	NC	**	NC
3210 Mdl 1 Adapter	7844*	121	110	5,990	4.00
3215 Adapter	7855*	204	186	10,160	4.50
12K Control Storage Increment					
First	7861*	252	230	12,330	20.00
Second	7862*	252	230	12,330	20.00
2314/3340 Compatibility Fea	8070*	55	50	1,535	NC
Universal Char Set Adapter	8637*	40	37	1,630	7.50
Virtual Machine Assist	8740	NC	NC	**	NC

Before ordering, check Special Feature write-ups for Prerequisites and Limitations.

TABLE 1-A ADDITIONAL LINE APPEARANCES

FEATURE	Line Position							
	1	2	3	4	5	6	7	8
Additional Lines	in 4640	4722	4723	4724	4725	4726	4727	4728

Specify additional lines according to line position.

TABLE 1-B TERMINAL ADAPTERS

FEATURE	Line Position							
	1	2	3	4	5	6	7	8
Terminal Adapter								

⌘ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

* Feature supplies CPU diskette.

** CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. \$405 on purchased machines when combined with changes subject to a distribution fee to include any number of diskette-only changes ordered on the same diskette.

Type I Model II ⌘ Terminal Adapter	9721	9722	9723	9724	9725	9726	9727	9728
Type III ⌘ Synchronous Data Adapter Type II ⌘ Telegraph Adapter Type II ⌘	9753	9754	9755	9756	9757	9758	9759	9760
	9649	9650	9651	9652	9653	9654	9655	9656
	9785	9786	9787	9788	9789	9790	9791	9792

Any adapter added, removed, or relocated to another line position requires reconfiguration of the entire line.
Select one terminal adapter for each line position specified in TABLE 1-A.

TABLE 1-C

OPTIONS FOR TERMINAL ADAPTER
TYPE I MODEL II

FEATURE	Line Position							
	1	2	3	4	5	6	7	8
300 bps ⌘	9593	9594	9595	9596	9597	9598	9599	9600
600 bps ⌘	9601	9602	9603	9604	9605	9606	9607	9608
Switched Network Facility ⌘	9625	9626	-627	9628	9629	9630	9631	9632
Read Interrupt ⌘	9737	9738	9739	9740	9741	9742	9743	9744
Write Interrupt ⌘	9745	9746	9747	9748	9749	9750	9751	9752
Unit Excpn Supprsn ⌘	9729	9730	9731	9732	9733	9734	9735	9736
Autocall	9777	9778	9779	9780	9781	9782	9783	

TABLE 1-D

OPTIONS FOR TERMINAL ADAPTER TYPE III

FEATURE	Line Position							
	1	2	3	4	5	6	7	8
Multipoint ⌘	9761	9762	9763	9764	9765	9766	9767	9768
New Sync ⌘	9808	9809	9810	9811	9812	9813	9814	9815
Modem Clocking	9609	9610	9611	9612	9613	9614	9615	9616

Select modem clocking feature for each line position for which Terminal Adapter Type III is specified and operation at 2400 bps is desired.

TABLE 1-E

OPTIONS FOR SYNCHRONOUS
DATA ADAPTER TYPE II

FEATURE	Line Position							
	1	2	3	4	5	6	7	8
Transparency ⌘	9673	9674	9675	9676	9677	9678	9679	9680
Switched Network Facility ⌘	9625	9626	9627	9628	9629	9630	9631	9632
Half Duplex Facility ⌘	9617	9618	9619	9620	9621	9622	9623	9624
Tributary Station ⌘	9665	9666	9667	9668	9669	9670	9671	9672
Modem Clocking	9609	9610	9611	9612	9613	9614	9615	9616
New Sync ⌘	9808	9809	9810	9811	9812	9813	9814	9815
Autocall	9777	9778	9779	9780	9781	9782	9783	
EON ⌘	9801	9802	9803	9804	9805	9806	9807	

Select features required for each line position for which Synchronous Data Adapter Type II is specified.

OPTIONAL PRIMARY DATA CODES

ASCII ⌘	9681	9682	9683	9684	9685	9686	9687	9688
6-Bit Transcode (1) ⌘	9689	9690	9691	9692	9693	9694	9695	9696

Select one of the above data codes if required in lieu of EBCDIC for each line position for which Synchronous Data Adapter Type II is specified.

OPTIONAL ALTERNATE DATA CODES

EBCDIC ⌘	9697	9698	9699	9700	9701	9702	9703	9704
ASCII ⌘	9705	9706	9707	9708	9709	9710	9711	9712
6-Bit Transcode (1) ⌘	9713	9714	9715	9716	9717	9718	9719	9720

Select one of the above Alternate Data Codes if required for each line position for which Synchronous Data Adapter Type II is specified.

TABLE 1-F

OPTIONS FOR TELEGRAPH ADAPTER TYPE II

FEATURE	Line Position							
	1	2	3	4	5	6	7	8
Telegraph Adapter Type II ⌘	9785	9786	9787	9788	9789	9790	9791	8792
Autocall	9777	9778	9779	9780	9781	9782	9783	
Swchd Ntwk Facility ⌘	9625	9626	9627	9628	9629	9630	9631	9632

(1) 6-Bit Transcode can be used only with a 2780 Data Transmission Terminal.



3135 Processing Unit (cont'd)

TABLE 2 -- Part 1

FEATURES REQUIRED FOR START/STOP TERMINALS

Terminal	IBM Modem	Line Speed (Bits/sec)	Communication Line and Modem Facilities	Features Required
1050 Data Communication System		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility
			D1	Terminal Adapter Type I Model II
2260 Display Station Model 1			Connects via 2848 Display Control Model 3 - see this table	
2260 Display Station Model 2			Connects via 2848 Display Control Model 1 or 2 - see this table	
2265 Display Station Model 1			Connects via the 2845 Display Control Model 1 - see this table	
2740 Communication Terminal Model 1		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility
			D1	Terminal Adapter Type I Model II
2740 Communication Terminal Model 2		134.5	D1	Terminal Adapter Type I Model II
		600	D2	Terminal Adapter Type I Model II; and 600 Bits Per Second
2741 Communication Terminal Model 1 (without interrupt feature)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility
			D1	Terminal Adapter Type I Model II
2741 Communication Terminal Model 1 (with Receive Interrupt Feature)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and Write Interrupt; and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II; and Write Interrupt; and Unit-Exception Suppression (if required)
2741 Communication Terminal Model 1 (with Transmit Interrupt feature)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and Read Interrupt; and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II; and Read Interrupt; and Unit-Exception Suppression (if required)
2741 Communication Terminal Model 1 (with Receive Interrupt and Transmit Interrupt features)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and Write Interrupt; and Read Interrupt; and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II; and Write Interrupt; and Read Interrupt; and Unit-Exception Suppression (if required)
2760 Optical Image Unit Model 1			Connects via 2740 Communication Terminal Model 1 - see this table	
2845 Display Control Model 1 (point-to-point or multipoint)	3872 Model 1	1200	D3	Terminal Adapter Type III multipoint for multipoint operation
		2400	D4	Terminal Adapter Type III and Modem Clocking multipoint for multipoint operation and New Sync (if required)
2848 Display Control Models 1, 2 and 3 (point-to-point or multipoint)	3872 Model 1	1200	D3	Terminal Adapter Type III multipoint for multipoint operation
		2400	D4	Terminal Adapter Type III and Modem Clocking multipoint for multipoint operation and New Sync (if required)
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (without interrupt feature)		300	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and 300 Bits Per Second Line Speed
			D1	Terminal Adapter Type I Model II; and 300 Bits Per Second Line Speed
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Receive Interrupt feature)		300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II, and Write Interrupt, and 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Transmit Interrupt feature)		300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, and Read Interrupt, and 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II, and Read Interrupt, and 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Receive Interrupt and Transmit Interrupt features)		300	C1	Terminal Adapter Type I Model II, Switched Network Facility, Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II, and Write Interrupt, and Read Interrupt, and 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
3767 Communications Terminal Model 1 or 2 with (#7111) - 2740-1 Line Control		300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, and 300 Bits Per Second Line Speed
			D1	Terminal Adapter Type I Model II, and 300 Bits Per Second Line Speed
3767 Communications Terminal Model 1 or 2 or 3 with (#7112) - 2740-2 Line Control		600	D2	Terminal Adapter Type I Model II, and 600 Bits Per Second Line Speed
System/7		134.5	C1	Terminal Adapter Type I Model II, and Switched Network Facility
			D1	Terminal Adapter Type I Model II
		600	D2	Terminal Adapter Type I Model II, and 600 Bits Per Second Line Speed



3135 Processing Unit (cont'd)

TABLE 2 -- Part 1 (cont'd) FEATURES REQUIRED FOR START/STOP TERMINALS

5100/51110 Computer Systems	134.5	C1	Terminal Adapter Type I Model II, and Switched Network Facility, Read interrupt, Write Interrupt, and Unit-Exception Suppression (if required)
		D1	Terminal Adapter Type I Model II, and Read Interrupt, Write Interrupt, and Unit-Exception Suppression (if required)
	300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
		D1	Terminal Adapter Type I Model II, and Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
TTY 33/35	110	C2	Telegraph Adapter Type II

TABLE 2 -- Part 2 FEATURES REQUIRED for BINARY SYNCHRONOUS TERMINALS

Line Speed (Bits/Sec)	IBM Modem	Manner of Line Operation	Communication Line and Modem Facilities	Features Required
600		Point-to-Point	D3 (two-wire)	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Half Duplex Facility, and Data Code Features
			D2 (four-wire)	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features
			C3	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Switched Network Facility, and Data Code Features
				Multipoint -- 3135 as Control Station	D2 (four-wire)	Synchronous Adapter Type II, and 600 Bits Per Second, and Data Code Features
		Multipoint -- 3135 as Tributary Station	D2 (four-wire)	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Tributary Station, and Data Code Features
1200		Point-to-Point	D3 (two-wire)	Synchronous Data Adapter Type II, and Half Duplex Facility, and Data Code Features
			D3 (four-wire)	Synchronous Data Adapter Type II, and Data Code Features
			C4	Synchronous Data Adapter Type II, and Switched Network Facility, and Data Code Features
				Multipoint -- 3135 as Control Station	D3 (four-wire)	Synchronous Data Adapter Type II, and Data Code Features
		Multipoint -- 3135 as Tributary Station	D3 (four-wire)	Synchronous Data Adapter Type II, and Tributary Station, and Data Code Features
2400	3863	Point-to-Point	D4	Synchronous Data Adapter Type II; and Modem Clocking; and Switched Network Facility; and Data Code Features
2400	3863	Multipoint - 3135 as Control Station	D4	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync (if required)
2400	3863	Multipoint - 3135 as Tributary Station	D4	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
2400	3872 Model 1	Point-to-Point	C5	Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Switched Network Facility; and Data Code Features
2400	3872 Model 1	Point-to-Point	D4 (two-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Data Code Features
			D4 (four-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3135 as Control Station	D4 (four-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync (if required)
		Multipoint - 3135 as Tributary Station	D4 (four-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
		Point-to-Point, Multipoint	X1M	Synchronous Data Adapter Ty II, Modem Clock, Data Code Feature
4800	3864	Point-to-Point	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Switched Network Facility; and Data Code Features
4800	3864	Multipoint - 3135 as Control Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync (if required)
4800	3864	Multipoint - 3135 as Tributary Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
4800	3874 Model 1	Point-to-Point	C6	Synchronous Data Adapter Type II; and Modem Clocking; and Switched Network Facility; and Data Code Features
		Point-to-Point	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3135 as Control Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync
		Multipoint - 3135 as Tributary Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
		Point-to-Point, Multipoint	X2M	Synchronous Data Adapter Ty II, Modem Clock, Data Code Feature
7200	3875 Model 1	Point-to-Point	D6 (with C2 conditioning)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3135 as Control Station	D6 (with C2 conditioning)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3135 as Tributary Station	D6 (with C2 conditioning)	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features

**IBM 3135-3 PROCESSING UNIT**

Purpose: Provides a performance improvement for S/370 mdl 135 models H, HF, HG and I only.

Model

A1*	262,144 Bytes of Processor Storage
A2*	327,680 Bytes of Processor Storage
A3*	393,216 Bytes of Processor Storage
A4*	524,288 Bytes of Processor Storage

NOTE: The 3135-3 is available as a non-removable, field installable upgrade to a S/370 model 135 mdl H, HF, HG and I only.

* A complete systems assurance review/approval at the branch office level required before ordering.

Highlights: Depending on the model, up to 524,288 bytes of processor storage are available. CPU cycle time varies from 275 to 1485 nanoseconds depending upon the internal operation being performed. Sixteen general purpose and four floating point registers are provided.

Standard Features Include: APL Assist ... Audible Alarm ... Byte Oriented Operand ... 1 Byte Multiplexer Channel ... 64 Byte Multiplexer Subchannels ... Channel Command Retry ... Channel Indirect Addressing ... Clock Comparator and CPU Timer ... Conditional Swapping ... Console File ... Control Registers ... Dynamic Address Translation ... Error Checking and Correction (on Main and Control Storage) ... Extended Control Mode ... Extended Control-Program Support ... Instruction Retry ... Interval Timer ... Machine Check Handling ... OS/DOS Compatibility ... Program Event Recording ... Storage Protection (Store and Fetch) ... S/370 Universal Instruction Set (Floating Point included) ... Time of Day Clock ... PSW Key Handling.

Control Storage: 131,072 bytes of Reloadable Control Storage are provided for each model in addition to the applicable main storage. This feature permits emulator and control routines to function. The Reloadable Control Storage is housed in the CPU and is loaded from the Console File. Reloadable Control Storage is not addressable by the user.

Virtual Storage: Virtual Storage capability is provided to increase the effective utilization of main storage.

Console File (standard): This is the basic microprogram loading device for the system. The console file contains a small file device that provides all of the microcode for the system on removable magnetic disks. The several disks that will be supplied with the system will supply all of the required microcode for FE diagnostics, basic systems features, plus the optional features ordered for the system.

Console Function: Operator communications with the system is via a system control panel located on the 3135-3 and a 3210 mdl 1 or 3215 Console Printer-Keyboard as on other models of the S/370 mdl 135. A right reading board extension is standard ... a left extension is not available.

Input/Output Channels:

Byte Multiplexer Channel -- one is standard ... functionally equivalent to the byte multiplexer channel on the S/370 mdl 135 ... provides eight control unit positions ... in byte mode, permits simultaneous operation of many low-speed devices. Burst mode operation of unbuffered devices operating in excess of 10KB is not allowed for concurrent operation with the Integrated File Adapter, the Integrated Communications Adapter, or the Block Multiplexer Channel -- see *IBM S/370 Model 135 Channel Characteristics Manual, GA33-3010* for further clarification ... for OS exclusion, refer to *SRL GC28-6554, System Generation*.

Block Multiplexer Channels -- two are available as special features ... data rates are 1.3 megabytes per second ... permit(s) simultaneous operation of high-speed devices ... ability to "Block Multiplex" provides greater channel efficiency ... devices on these channels which cannot utilize block multiplexing will function as if attached to selector channels ... if the 3330/3340 Series Integrated File Adapter is present these channels are addressed as 2 and 3 respectively. Otherwise they are addressed as 1 and 2.

Subchannels -- on the byte multiplexer channel 64 subchannels are provided as standard with the option of 128 or 256 (see "Special Features") ... on each of the two available block multiplexer channels, 16 non-shared subchannels and 1 shared subchannel are provided as standard with the option of 8 non-shared and 9 shared or 8 non-shared and 5 shared (see "Special Features") ... on a block multiplexer channel a single shared subchannel may attach a control unit having a maximum of 16 device addresses.

Input/Output Attachment:

Non-native -- a wide variety of I/O devices may be attached to these models of the S/370 mdl 135 via the standard byte multiplexer channel, and/or the optional block multiplexer channel(s). In particular, any I/O device which is attachable to a 3135 is attachable to the 3135-3.

Native -- the following integrated I/O attachments/adapters are provided for controlling the designated I/O devices.

Console Printer-Keyboard (Required) -- this unit serves as the on-line I/O device for operator/system communications. It provides a means of manually entering data into the system, altering or displaying data already in storage, and for printing error logout messages.

2319 Integrated File Adapter (#4650) (Optional) -- this feature enables native attachment of a 2319 Disk Storage mdl A1** (and a 2319 mdl A3**, 2312 mdl A1s** or 2318 mdl A1**) up to a total of eight drives. The IFA is addressed as channel 1. **LIMITATION:** Cannot be installed if 3333/3340 Intermix (#9315) is specified when 3330/3340 Series IFA (#4655) is also ordered.

3330/3340 Series Integrated File Adapter (#4655) (Optional) -- this feature allows the native attachment of one or two 3333 modules or 3340 mdl A2 units. Each 3333 module (either mdl 1 or mdl 11) can attach up to three 3330 modules (any combination of mdls 1, 2 or 11). Each 3340 mdl A2 can attach 3340 mdl B2 or B1 units and one 3340 mdl A2 can also attach 3344 units to a maximum of eight drives. Maximum is sixteen drives per IFA. If 2319 IFA (#4650) is also present, IFA Conversion Feature (#4645) is required.

Integrated Communications Adapter (Optional) -- this feature provides attachment of up to eight teleprocessing lines to the 3135-3. These may be any combination of supported BSC and Start/Stop lines and appear to the processor as if connected via one or more 2701s on the byte multiplexer channel.

Integrated Printer Adapter (Optional) -- this feature enables native attachment of a 1403 Printer mdl 2, 7 or N1. The Universal Character Set Feature can be optionally specified on the 1403 mdl 2 or N1.

Programming Features:

APL Assist (standard) -- this feature is an APL emulator. It replaces functions performed by the APL software interpreter. This feature can provide a performance improvement for many APL applications when used with VS APL PP #5748 AP1.

Conditional Swapping (standard) -- provides two additional instructions ... Compare and Swap ... Compare Double and Swap.

PSW Key Handling (standard) -- provides two additional instructions ... Insert PSW Key ... Set PSW Key from Address.

Extended Control Program Support (standard) -- the 3135-3 processor models of the S/370 mdl 135 include Extended Control-Program Support. This is a hardware assist that reduces the CPU time needed to execute certain frequently used supervisor functions in both VS-1 and VM/370.

The functional areas for VM/370 include:

- Virtual Machine I/O
- Storage Management
- Page Management
- SVC Handler
- Privileged Instruction Interfaces
- Dispatching
- Virtual Interval Timer

For VS-1 the functional areas are:

- Storage Management
- IOS
- SVC FLIH
- System Trace
- Page Management

PREREQUISITES: The following prerequisites apply to each 3135-3 processor model.

- (1) 3046 Power Unit ... see 3046.
- (2) Extended Precision Floating Point Feature (#3840) ... see 3135 Processing Unit Special Features.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Cabling: #9080 for below the floor, or #9081 for on the floor.

[3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

** No longer available.

§ See footnote on following page.

3135-3 Processing Unit (cont'd)

- [4] Console Printer-Keybord Address: Recorded on console file disk at the plant. #9101\$ for X'01F', or #9102\$ for X'009'.
- [5] Minimum Configuration: See "Minimum Configurations" in "Systems" for minimum I/O units required in a S/370 mdl 135.
- [6] Console Printer-Keybord: A 3210 mdl 1 or 3215 Console Printer-keyboard is required in every system ... see 3210, 3215 and "Special Features."
- [7] Shipping Instructions: Unless otherwise specified, shipping dimensions of the 3135 Frame 01 (CPU) are 31-1/2" wide x 70" long x 60" high. Removal of the side covers will reduce the width to 29-1/2". If further reduction in length is required, specify #9570. Shipping dimensions will then be 29-1/2" wide x 60" long x 60" high.

NOTE: RETAIN/370 ... CE access is by telephone.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Year	Purchase	MMMC
3135-3	A1	\$13,240	\$12,055	\$470,550	\$ 801
	A2	13,940	12,695	492,450	855
	A3	14,640	13,335	514,350	909
	A4	16,040	14,615	558,150	1,020

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Base Unit Machine Group: A
 Per Call: 3 Purchase Option: 50% Warranty: A
 Useful Life Category: 2 Termination Charge Months: 6
 Termination Charge Percent: 25% Upper Limit Percent: 5%
 Model/Feature Additional Charge in lieu of AU Charge: 15%

Model Changes: Field installable.

Planning For Model Conversions: When a customer requires feature changes (except for the prerequisite feature Extended Precision Floating Point, #3840), and/or memory upgrades in addition to a model upgrade to a 3135-3, consolidating the several changes into a single is not recommended.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges and parts removed remain the property of the customer)

From	To	A1	A2	A3	A4
H *		\$120,000	\$141,900	\$163,800	\$207,600
HF *			120,000	141,900	185,700
HG *				120,000	163,800
I *					120,000
A1			21,900	43,800	87,600
A2				21,900	65,700
A3					43,800

* Prices shown do not include charges for any 3135-3 prerequisite features.

SPECIAL FEATURES

BLOCK MULTIPLEXER CHANNEL (#1425, 1426). Each adds a block multiplexer channel with 16 non-shared subchannels and 1 shared selector subchannel to the system. #1425 -- first ... #1426 -- second. If the 3330/3340 Series Integrated File Adapter is present these channels are addressed as 2 and 3 respectively. Otherwise they are addressed as 1 and 2. **Field Installation:** Yes. **Prerequisite:** #1426 requires #1425.

BLOCK MULTIPLEXER SHARED SUBCHANNELS (#1431). Note: This feature should only be installed if devices See 370 I/O Configuration Form GA22-7002. Allows any one of the following combinations of "Non-Shared," "Block Shared," or selector subchannels to be attached to the block multiplexer channel: [1] 16 Non-Shared and 1 Shared Selector (see address restrictions) ... [2] 8 Non-Shared, 8 Block Shared, and 1 Shared Selector (see address restrictions) ... [3] 8 Non-Shared, 4 Block Shared, and 1 Shared Selector (see address restrictions). If option [2] is selected, then each block shared subchannel may have attached to it a control unit having a maximum of 16 device addresses. If option [3] is selected, the four block shared subchannels may each have attached a control unit having a maximum of 32 device addresses. If option [1] is selected, no block shared subchannels are available, and addresses X00 through X7F are not available. With any option, the selector subchannel may have attached to it control units with a maximum of 16 device addresses. This feature will apply to both selector channels if installed. The options are selectable by the Customer Engineer and may be defined differently

\$ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. 3405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

on each channel. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Block Multiplexer Channel, First (#1425).

Address Restrictions with #1431

- a) Addresses X00 through X7F are assigned as block shared subchannels. With option [1] they may not be used. With option [2] each control unit address position, i.e., X00, X10, X20, etc., through X70 is available. With option [3] "even" control unit address positions only are available, i.e., 00, 20, 40 and 60.
- b) Selector and Non-Shared addresses are limited to addresses X80 through XFF.

MULTIPLEXER SUBCHANNELS, ADDITIONAL (#3906, 3907). To increase the number of I/O devices on the byte multiplexer channel, the number of subchannels can be increased by specifying one of the following: #3906 -- for 128 subchannels, or #3907 -- for 256 subchannels. The maximum number of shared subchannels is eight. When 256 subchannels are installed, there are no shared subchannels. **Note:** The number of subchannels ordered must be equal to or greater than the device addresses. Also see "Byte Multiplexer Channel" under "Input/Output Channels" above. **Field Installation:** Yes.

3330/3340 SERIES INTEGRATED FILE ADAPTER (#4655). Permits native attachment of up to two 3333s or 3340 mdl A2s. A maximum of sixteen 3330 or 3340 Series drives may be attached to the IFA. The IFA supports rotational position sensing, disconnected command chaining, and multiple requesting. Record overflow is standard. For 3330, standard I/O addresses are (hex) 150 thru 15F. For 3340, standard addresses are (hex) 1C0 thru 1CF. For 3340 with 3344 standard addresses are (hex) 1C0 thru 1E1. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** IFA Conversion feature (#4645) is required if installed with 2319 IFA (#4650).

Specify: [1] DASD Designation: Specify ONE of the following -- #9313\$ (DASD 3333/3330) to attach up to two 3333 mdl 1s, each with up to three 3330 mdls 1/2 in any combination ... #9314\$ (DASD 3340 only) to attach up to two 3340 mdl A2s, each with up to three 3340 mdls B1/B2 in any combination ... #9315\$ (3333/3340 Intermix) to attach one 3333 mdl 1 (with up to three 3330 mdls 1/2 in any combination) plus one 3340 mdl A2 (with up to three 3340 mdls B1/B2 in any combination). #9315 cannot be installed with IFA Conversion Feature (#4645).

- [2] If any 3333 mdl 11 and/or 3330 mdl 11 is to be attached, also specify #9316\$ (3333/3330 mdl 11) in addition to #9313 or #9315.

With #9313 plus #9316 a mixture of one 3333 mdl 1 and one 3333 mdl 11, each with up to three 3330 mdls 1, 2 and 11 (in any combination) can be attached ... or two 3333 mdl 11s, each with any mixture of up to three 3330 mdls 1, 2 and 11.

With #9315 plus #9316, one 3333 (either mdl 1 or mdl 11) with up to three 3330 mdls 1, 2 and 11 (in any combination) can be attached in addition to one 3340 mdl A2 with up to three associated mdls B1/B2. The standard addresses with #9315 for 3330 are (hex) 150 thru 15F, for 3340 (hex) 158 thru 15F.

- [3] If any 3344 is to be attached, specify #9317\$ in addition to #9314 (#9317 and #9315 are mutually exclusive). #9190\$ must also be specified if 3344 mdl B2Fs or the 3340 Fixed Head Feature (#4301/4302) is ordered.

With #9314, #9317 and #9190 up to three 3344 mdl B2/B2F and/or 3340 mdl B2, B1 units in any combination can be attached to one 3340 mdl A2. The second 3340 mdl A2 if present can attach up to three 3340 mdl B1/B2 units.

#9317 is mutually exclusive with IFA Conversion Feature (#4645) and with 2314/3340 Compatibility Feature (#8070).

- [4] When #9314 is specified, also specify 3340 Address Designation: #9820\$ for addresses (hex) 1C0 thru 1CF, or #9821\$ for addresses (hex) 160 thru 16F. The specification of 160 allows the 3135 IFA addresses to coincide with those of the 3115 and 3125 IFAs.

- [5] When #9314 or #9315 is specified, also specify #9190\$ (Fixed Head Attachment) if Fixed Head Feature (#4301/4302) is ordered for any 3340 attached to the IFA.

- [6] If String Switch (#8150) is ordered for any attached 3333 or 3340 mdl A2, specify String Switch Attachment (#9841\$).

- [7] When #9821\$ is specified in conjunction with #9313 the addresses for the 3333/3330s are (HEX) 160 thru 16F.

- [8] When #9821\$ is specified and both #9314 and #9317 are specified, the addresses for the 3340/3344s are as follows:



3135-3 Processing Unit (cont'd)

	3340 A2		---- 3344 B2/B2Fs ----																							
String 0	160	161	162	163	164	165	166	167	172	173	174	175	176	177	1E2	1E3	1E4	1E5	1E6	1E7	1F2	1F3	1F4	1F5	1F6	1F7
Physical Drive	0	1	2	3	4	5	6	7																		
	3340 A2		---- 3340 B2s ----																							
String 1	168	169	16A	16B	16C	16D	16E	16F																		

Note: The DASD control combinations that can be attached to the 3330/3340 Series IFA (#4655) are shown in the left hand column of the table below. From Section A of the table select one of the feature numbers shown (one and only one must be selected). From Section B select the feature number(s) required to support your configuration (select none, one or more than one from Section B). Section C of the table shows the addresses available. The specification of the (HEX) 160 addresses allows the 3135-3 IFA addresses to coincide with those of the 3115 and 3125 IFA. Select a number from Section C if required.

3135-3, 3330/3340 IFA (#4655)

	SECTION A	SECTION B								SECTION C	
	DASD Designation, one req'd	If any 3333 Mdl 11 and/or 3330 Mdl 11	3344	3344 Mdl B2F	Fixed Head Feature (#4301/4302) on 3340	String Switch #8150 on 3333/ 3340	2314/ 3340 Compatibility Feature (see #8070)	3330/3340 Supports RPS Disconnected CMMD Chaining Multiple Requesting if BLK MPX #1421 installed	2319 IFA (#4650)	Standard	Address 160
3333 Disk Storage Control	9313 ‡	9316‡	--	--	--	9841 ‡	--	1421	4645	* HEX 150-15F	9821 ‡ HEX 160-16F
3333/3340 Intermix	9315 ‡	9316 ‡	--	--	9190 ‡	9841 ‡	--	1421	--	*3330 HEX 150-157 3340 HEX 158-15F	--
3340 Direct Access Storage Facility	9314 ‡	--	9317 ‡	9317 ‡ + 9190 ‡	9190 ‡	9841 ‡	** 8070	1421	*** 4645	9820 ‡ Not 3344 HEX 1C0-1CF 3344 HEX 1C0-1E1	9821 ‡ Not 3344 HEX 160-16F See Item 8 above

* No feature number required.

** Mutually exclusive with String Switch #9841, 2319 IFA (#4650), IFA Conversion feature (#4645), 3344 Attachment (#9317).

*** Mutually exclusive with 3344 Attachment (#9317) and 2314/3340 Compatibility (#8070).

CHANNEL PRIORITY (#1501). When the IFA (#4650 or #4655) and both block multiplexer channels are present, this feature changes the higher priority for command chaining from the first block multiplexer channel (Channel 2) to the second block multiplexer channel (Channel 3). #1501 is required if any DASD devices are to be attached to Channel 3. **Field Installation:** Yes. **Prerequisites:** Integrated File Adapter (#4650 or #4655) and both Block Multiplexer Channels (#1425 and #1426).

DIRECT CONTROL (#3274). Provides two instructions, Read Direct and Write Direct, and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in S/360 Direct Control Feature - OEMI, GA22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide a single emergency power-off switch in a "room" or "area." See Emergency Power-Off Control under S/370 mdl 135 in "Systems." #3621 -- to interconnect two emergency power-off switches ... #3622 -- to interconnect up to twelve emergency power-off switches. **Field Installation:** Yes.

EXTENDED PRECISION FLOATING POINT (#3840). [Prerequisite for 3135-3] For description, see M 3135 pages.

1401/1440/1460 COMPATIBILITY (#4457). Microprogrammed controlled feature, which, in conjunction with special software, permits the system to execute 1401/1440/1460 instructions. **Field Installation:** Yes.

IFA CONVERSION FEATURE (#4645). Permits co-residence of both 2319 Integrated File Adapter (#4650) and 3330/3340 Series Integrated File Adapter (#4655). Both IFAs are addressed as Channel 1. **Maximum:** One. **Limitations:** Cannot be installed if 3333/3340 Intermix (#9315) or 3344 Attach (#9317) is specified ... cannot be installed with 2314/3340 Compatibility Feature (#8070). **Field Installation:** Yes. **Prerequisites:** 2319 Integrated File Adapter (#4650) and 3330/3340 Series IFA (#4655).

2319 INTEGRATED FILE ADAPTER (#4650). Permits native

attachment of a 2319 mdl A1 (and a 2319 mdl A3, 2312 mdl A1s or 2318 mdl A1) up to a total of 8 drives ... see item [4] under "Ordering Instructions" on the 2319. Standard features include file scan and record overflow functions. The IFA is always addressed as Channel 1. **Maximum:** One. **Limitations:** Cannot be installed if 3333/3340 Intermix (#9315) is specified under 3330/3340 Series IFA (#4655) ... cannot be installed with 2314/3340 Compatibility Feature (#8070). **Field Installation:** Yes. **Prerequisite:** IFA Conversion Feature (#4645) required if installed with 3330/3340 Series IFA (#4655).

INTEGRATED PRINTER ADAPTER BASIC CONTROL (#4670). Provides the power supply and basic control for a natively attached 1403 Printer. The standard address is "00E". **Specify: #9485** if optional address of "00F" is desired. **Maximum:** One. **Field Installation:** Yes.

INTEGRATED 1403 PRINTER MDL 2, MDL N1 ATTACHMENT (#4672). Provides control for attaching 1403 mdl 2 or N1. **Specify: #9182‡** to attach 1403 mdl 2, **#9188‡** to attach 1403 mdl N1. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Integrated Printer Adapter Basic Control (#4670). On the 1403, Voltage Adapter (#9709) and 600 LPM Voltage Conversion Adapter (#9725) are required on a mdl 2; 1100 LPM Voltage Conversion Adapter (#9726) is required on a mdl N1. See Specify under 1403.

INTEGRATED 1403 PRINTER MDL 7 ATTACHMENT (#4677). Provides control for attaching a 1403 mdl 7. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Integrated Printer Adapter Basic Control (#4670). On the 1403, 600 LPM Voltage Conversion Adapter (#9725) is required on a mdl 7. See Specify under 1403.

S/360 MODEL 20 COMPATIBILITY (#7520). Microprogrammed controlled feature which, in combination with special software, permits the system to execute S/360 mdl 20 or S/360 mdl 25 in mdl 20 mode instructions. **Field Installation:** Yes.

3210 MDL 1 ADAPTER (#7844). To attach a 3210 Console Printer-Keyboard mdl 1 (15.5 cps) for systems console I/O ...

‡ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

**3135-3 Processing Unit (cont'd)**

includes an alter-display ability. **Maximum:** One. **Limitation:** Cannot be installed with 3215 Adapter (#7855). **Field Installation:** Yes. **Prerequisite:** Uses one address on the standard byte multiplexer channel, but does not use a control unit position. See "Specify."

3215 ADAPTER (#7855). To attach a 3215 Console Printer-Keyboard (85 cps) for systems console I/O ... includes alter-display ability. **Maximum:** One. **Limitation:** Cannot be installed with 3210 Mdl 1 Adapter (#7844). **Field Installation:** Yes. **Prerequisite:** Uses one address on the standard byte multiplexer channel, but does not use a control unit position. See "Specify."

2314/3340 COMPATIBILITY FEATURE (#8070). Permits the emulation of 2314/2319 volumes on the 3340 Disk Storage. The user program may access both the emulated 2314 data set as well as 3340 volumes. This provides a "mixed-mode" operating environment. "mixed-mode" is only possible with DOS releases which support 3340 on the 3135-3. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with IFA Conversion Feature (#4645), 2319 IFA (#4650), 3333/3340 Intermix (#9315), 3344 Attach (#9317), or String Switch Attachment (#9841). **Prerequisite:** #9314 on 3330/3340 Series IFA (#4655).

UNIVERSAL CHARACTER SET ADAPTER (#8637). Permits the use of the Universal Character Set feature on a 1403 mdl 2 or N1 attached via the Integrated 1403 Printer mdl 2, mdl N1 Attachment (#4672). **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Integrated Printer Adapter Basic Control (#4670), Integrated 1403 Printer mdl 2, mdl N1 Attachment (#4672).

INTEGRATED COMMUNICATIONS ADAPTER (#4640). Provides the circuits and controls for direct attachment of up to eight teleprocessing lines to the 3135-3. The controls for the first line adapter are included in this feature. Lines can be any combination of Start/Stop or BSC. Provides for the attachment of 1050, 2260 mdl 1, 2260 mdl 2, 2265 mdl 1, 2740 mdl 1, 2740 mdl 2, 2741 mdl 1, 2760 mdl 1, 5010 Axx, or any IBM computer, multiplexer or terminal conforming to the Binary Synchronous Communications (BSC) standard. **Note:** In addition to the appropriate adapter, each communications line attached to the system requires an external modem.

Refer to *Table 2* below to define customer configuration requirements prior to ordering features below. **Customer Responsibilities** -- see M 2700 pages for customer responsibilities regarding communications facilities and servicing requirements. **Communications Facilities** -- see M 2700 pages for communications facility requirements with this feature. **Field Installation:** Yes.

AUTOCALL (#1290). Provides automatic calling capabilities on facilities C1, C2, C4 or C5 to initiate (dial) through stored program control, a data link to a remote station. For the appropriate automatic calling units, see M 2700 pages. **Specify:** Refer to *Table 1C* for Terminal Adapter Type I Model II or *Table 1-E* for Synchronous Data Adapter Type II or *Table 1-F* for Telegraph Adapter Type II for appropriate feature code according to line positions desired. **Maximum:** Four. **Limitations:** Each Autocall feature installed reduces the number of lines available on the ICA by one. Autocall must be ordered once for each line where the function is desired. Thus, the ICA can accommodate a maximum of four lines if each of these lines also has the Autocall feature. A single Autocall feature can be associated with any of the lines from one to seven. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** Terminal Adapter Type I Model II (#9721-9728) or Synchronous Data Adapter Type II (#9649-9656) or Telegraph Adapter Type II (#9785-9792) and Switched Network Facility (#9625-9632).

ADDITIONAL LINES (#4722 - 4728). Each provides circuits and controls for attachment of an additional line adapter ... for a total of eight lines in a system. **Specify:** Order additional lines according to line position required ... see *Table 1-A* below. Each line specified requires the next lower order line as a prerequisite. **Maximum:** One of each (#4722 thru #4728). **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

SPECIFY REQUIREMENTS FOR INTEGRATED COMMUNICATIONS ADAPTER For each line (#4722-4728) attached to the ICA, including the first line included in #4640, one of the following line adapters must be specified: Terminal Adapter Type I Model II (#9721-9728), Terminal Adapter Type III (#9753-9760), Telegraph Adapter Type II (#9785-9792), or Synchronous Data Adapter Type II (#9649-9656). Each line adapter and all associated features must be specified according to the line position to which they correspond. Refer to *Table 2* below prior to ordering features for the ICA.

TERMINAL ADAPTER TYPE I MODEL II (#9721-9728).§ Controls data transfers between the 3135-3 and 1050/2740 mdl 1/2741/5010 mdl Axx over facility C1 or D1, and between the 3135-3 and 2740 mdl 2 or 5010 mdl Axx over facility D1 or D2. Includes vertical and longitudinal checking for 1050 terminals and 2740s equipped with Record Checking (#6114). **Specify:** Refer to *Table 1-B* for appropriate feature code according to line position(s) desired. **Special Requirements:** See *Table 1-C* and features below

for additional specify requirements if Switched Network Facility, Write Interrupt, Unit Exception Suppression, Read Interrupt, or Autocall are required. Normal operation is at 134.5 bps. 600 Bits per Second feature must be specified for operation at 600 bps to 2740s or 5010 mdl Axx. **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

300 BITS PER SECOND (#9593-9600).§ Allows the Terminal Adapter Type I Model II to operate at 300 bps. **Specify:** Refer to *Table 1-C* for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II.

600 BITS PER SECOND (#9601-9608).§ Allows the Terminal Adapter Type I Model II or the Synchronous Data Adapter Type II to operate at 600 bps. **Specify:** Refer to *Table 1-C* for Terminal Adapter Type I Model II or *Table 1-E* for Synchronous Data Adapter Type II for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II, or Synchronous Data Adapter Type II.

SWITCHED NETWORK FACILITY (#9625-9632).§ Allows the Terminal Adapter Type I Model II, Synchronous Data Adapter Type II, or Telegraph Adapter Type II to operate over C type switched lines. **Specify:** Refer to *Table 1-C* for Terminal Adapter Type I Model II, *Table 1-E* for Synchronous Data Adapter Type II, or *Table 1-F* for Telegraph Adapter Type II for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II, Synchronous Data Adapter Type II, or Telegraph Adapter Type II.

WRITE INTERRUPT (#9745-9752).§ Allows the Terminal Adapter Type I Model II to operate with a 2741 equipped with Receive Interrupt (#4708). Not supported under BTAM, QTAM or TCAM. **Specify:** Refer to *Table 1-C* for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II.

READ INTERRUPT (#9737-9744).§ Allows the Terminal Adapter Type I Model II to operate with a 2741 equipped with Transmit Interrupt (#7900). Not supported under BTAM, QTAM or TCAM. **Specify:** Refer to *Table 1-C* for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II.

UNIT EXCEPTION SUPPRESSION (#9729-9736).§ If this feature is installed with Terminal Adapter Type I Model II, Unit Exception will not be set in response to a Circle C. Not supported under BTAM, QTAM or TCAM. **Specify:** Refer to *Table 1-C* for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type I Model II.

TERMINAL ADAPTER TYPE III (#9753-9760).§ Controls data transfers between the 3135 and either remote 2845 Display Controls or 2848 Display Controls operating at 1200 bps over facility D3. Permits operation at 2400 bps over facility D4 if Modem Clocking is specified. **Specify:** Refer to *Table 1-B* for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

MULTIPOINT (#9761-9768).§ Specifies that a Terminal Adapter Type III is to operate in multipoint mode. If #9761-9768 is not ordered for a given Terminal Adapter Type III, point-to-point operation is presumed. **Specify:** Refer to *Table 1-D* for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type III.

MODEM CLOCKING (#9609-9616). Allows a Terminal Adapter Type III to operate at 2400 bps or a Synchronous Data Adapter Type II to operate at 2000 bps, 2400 bps, 4800 bps or 7200 bps. Requires the appropriate clocking to be in the attached modem. **Note:** Certain modems such as the IBM 3872 mdl 1 although basically 2400 bps modems, offer a 1200 bps half speed facility. Since the requirements for the Modem Clocking feature are defined by the type of modem, not the line speed, when such modems are attached to the Synchronous Data Adapter Type II and are switched for 1200 bps operation, Modem Clocking is still required as a prerequisite on the ICA. **Specify:** Refer to *Table 1-D* for Terminal Adapter Type III or *Table 1-E* for Synchronous Data Adapter Type II for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type III or Synchronous Data Adapter Type II.

NEW SYNC (#9808-9815).§ Allows the Synchronous Data Adapter Type II or Terminal Adapter Type III to be connected to modems which offer the New Sync feature option and have this option installed. New Sync feature minimizes modem turnaround and allows faster bit synchronization of the following data. **Specify:** Refer to *Table 1-D* for Terminal Adapter Type III, code according to line position(s) desired. **Field Installation:** Yes. **Prerequisites:** Modem Clocking (#9609-9616), and a modem

§ CPU diskette-only specify feature. No fee when manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

3135-3 Processing Unit (cont'd)

offering New Sync. **Note:** New Sync is NOT required if Half Duplex Facility (#9617-9624), Tributary Station (#9665-9672), or Switched Network (#9625-9632) is installed for the line position in question.

TELEGRAPH ADAPTER TYPE II (#9785-9792).S Controls data transfers between ICA and Model 33/35 TTY terminals (8 level code at 110 bps only) with facility C2. **Specify:** Refer to Table 1-B for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisites:** Integrated Communications Adapter (#4640) and Switched Network Facility (#9625-9632).

SYNCHRONOUS DATA ADAPTER TYPE II (#9649-9656).§ Provides control of data transfers between the 3135-3 and binary synchronous terminals. See "Binary Synchronous Terminals" under 2701 Data Adapter Unit. Control Station is included with this feature. **Specify:** Refer to Table 1-B for appropriate feature code according to line position(s) desired. **Speed Selection:** Provides operation over C3, D2 and D3 facilities at 600 bps if 600 Bits Per Second feature is specified ... see above. Provides operation over C4 and D3 facilities at 1200 bps (no speed need be specified). Provides operation over C5M facility at 2000 bps if Modem Clocking is specified ... see above. Provides operation over C5, D4 or X1M at 2400 bps, over C6, D5 or X2M at 4800 bps, or over D6 at 7200 bps ... see above. **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

Special Requirements: See Table 1-E and features below for additional specify requirements if Half Duplex Facility, Transparency, Tributary Station, Switched Network Facility, Autocall, EON, or New Sync are required. See Table 1-E and 600 Bits Per Second above if operation at 600 bps is required. See Table 1-E and Modem Clocking above if 2000 bps, 2400 bps, 4800 bps, or 7200 bps operation is required. The appropriate Data Code feature must be specified if other than EBCDIC is required as the primary data code ... see Data Code Features below.

Limitations: For line speed limitations refer to Model 135 Channel Characteristics Manual, GA33-3010.

HALF DUPLEX FACILITY (#9617-9624).§ Required if the Synchronous Data Adapter Type II is attached to a two-wire facility. **Note:** This feature is not required with Switched Network (#9625-9632) or Tributary Station (#9665-9672). **Specify:** Refer to Table 1-E for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Synchronous Data Adapter Type II.

TRIBUTARY STATION (#9665-9672).§ Required when a Synchronous Data Adapter Type II is installed and functioning on a leased communications line as a tributary station and not functioning as a control station. **Specify:** Refer to Table 1-E for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Synchronous Data Adapter Type II.

DATA CODE FEATURES. The primary data code for the SDA Type II is EBCDIC. As an option to EBCDIC either ASCII or 6-bit Transcode (2780 Data Transmission Terminal only) may be specified as the primary code. In addition to the primary code, an alternate data code, selected under program control, may be specified for the Synchronous Data Adapter Type II. EBCDIC, ASCII or 6-bit Transcode may be selected as an alternate code. **Specify:** Refer to Table 1-E for appropriate feature codes according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Synchronous Data Adapter Type II.

TRANSPARENCY (#9673-9680).§ Provides the Synchronous Data Adapter Type II with the ability to transmit and receive 8-bit binary as well as EBCDIC or ASCII codes ... or 6-bit binary data as well as 6-bit Transcode. This feature with ASCII modifies VRC/LRC checking to VRC/CRC checking. **Limitation:** ASCII code and Transparency cannot be installed together for the same line position when attached to the 2770, 2780, 3735, 3780, System/3, System/7, System/32 or System/34. **Specify:** Refer to Table 1-E for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Synchronous Data Adapter Type II.

EON (#9801-9807).§ Automatically generates an EON digit at the end of the dial sequence. **Specify:** Refer to Table 1-E for appropriate feature code according to line position(s) desired. **Specify:** for 3872 and 3874 Modem with EON option. **Field Installation:** Yes. **Prerequisites:** Autocall (#1290) ... Synchronous Data Adapter Type II.

Modems Up to eight modems can be attached to a 3135, any model. **Prerequisites:** Integrated Communications Adapter (#4640) and Synchronous Data Adapter Type II (#9649-9656) 2400 bps to 7200 bps, Terminal Adapter Type I Model II (#9721-9728) 134.5 bps to 600 bps, or Terminal Adapter Type III (#9753-9760) 1200 bps or 2400 bps. See feature descriptions for limitations.

Modem	Speed (bps)
3863	2400
3872	2400
3864	4800
3874	4800
3875	7200

Note: For communications capabilities, product utilization and special features, see 3863, 3864, 3872, 3874, 3875 and M 2700 pages.

Special Feature Prices:	TLP/		Purch	MMMM
	MAC/	MLC		
	MRC	4 Yr		
Autocall	1290*	\$ 56 \$ 51	\$ 2,180	\$ 1.00
Block Mltplx Channel, 1st	1425*	211 192	10,480	4.00
Block Mltplx Channel, 2nd	1426*	181 165	8,990	4.00
Block Mltplx Shared Subchnl	1431	NC NC	**	NC
Channel Priority	1501	NC NC	**	NC
Direct Control	3274*	131 120	5,205	1.00
Emergency Power-Off Control -				
for 2 switches	3621	NC NC	NC	NC
for up to 12 switches	3622	NC NC	NC	NC
Extnd Precision Fltng Pt	3840†*	30 28	1,485	1.00
Multiplexer Subchannels, Add'l				
128 subchannels	3906	NC NC	**	NC
256 subchannels	3907	NC NC	**	NC
1401/1440/1460 Cmpbtlty	4457	NC NC	**	NC
Intgrd Comm Adapter	4640*	242 220	9,470	22.50
IFA Conversion Feature	4645	NC NC	**	NC
2319 Intgrd File Adapter	4650*	515 468	22,740	13.00
3330/3340 Series IFA	4655*	708 644	19,820	3.00
Int Prntr Adptr Basic Cntrl	4670*	400 364	19,850	19.50
Int 1403 Prntr -2,-N1 Attach	4672*	10 10	415	.50
Int 1403 Prntr -7 Attach	4677*	10 10	415	.50
Lines, Additional				
Second	4722*	47 43	1,900	4.50
Third	4723*	95 87	3,815	9.00
Fourth	4724*	47 43	1,900	4.50
Fifth	4725*	144 131	5,690	14.50
Sixth	4726*	47 43	1,900	4.50
Seventh	4727*	47 43	1,900	4.50
Eighth	4728*	47 43	1,900	4.50
S/360 Mdl 20 Compatibility	7520	NC NC	**	NC
3210 Mdl 1 Adapter	7844*	121 110	5,990	4.00
3215 Adapter	7855*	204 186	10,160	4.50
2314/3340 Compatibility Fea	8070*	55 50	1,535	NC
Universal Char Set Adapter	8637*	40 37	1,630	7.50

† Prerequisite feature for 3135-3 ... see M 3135 pages (special features) for details.

* Feature supplies CPU diskette.

** CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. \$405 on purchased machines when combined with changes subject to a distribution fee to include any number of diskette-only changes ordered on the same diskette.

Before ordering, check Special Feature write-ups for Prerequisites and Limitations.

TABLE I-A ADDITIONAL LINE APPEARANCES

FEATURE	----- Line Position -----							
	1	2	3	4	5	6	7	8
Additional Lines	in 4640	4722	4723	4724	4725	4726	4727	4728

Specify additional lines according to line position.

TABLE I-B TERMINAL ADAPTERS

FEATURE	----- Line Position -----							
	1	2	3	4	5	6	7	8
Terminal Adapter								
Type I Model II §	9721	9722	9723	9724	9725	9726	9727	9728
Synchronous Data Adapter Type II §	9649	9650	9651	9652	9653	9654	9655	9656
Tel Adptr Type II §	9785	9786	9787	9788	9789	9790	9791	9792

Any adapter added, removed, or relocated to another line position requires reconfiguration of the entire line.
Select one terminal adapter for each line position specified in TABLE I-A.

§ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

**3135-3 Processing Unit (cont'd)****TABLE 1-C
OPTIONS FOR TERMINAL ADAPTER
TYPE I MODEL II**

FEATURE	Line Position							
	1	2	3	4	5	6	7	8
300 bps ‡	9593	9594	9595	9596	9597	9598	9599	9600
600 bps ‡	9601	9602	9603	9604	9605	9606	9607	9608
Swchd Ntwk Facility ‡	9625	9626	9627	9628	9629	9630	9631	9632
Read Interrupt ‡	9737	9738	9739	9740	9741	9742	9743	9744
Write Interrupt ‡	9745	9746	9747	9748	9749	9750	9751	9752
Unit Excpn Suppress ‡	9729	9730	9731	9732	9733	9734	9735	9736
Autocall	9777	9778	9779	9780	9781	9782	9783	

**TABLE 1-D
OPTIONS FOR TERMINAL ADAPTER TYPE III**

FEATURE	Line Position							
	1	2	3	4	5	6	7	8
Multipoint ‡	9761	9762	9763	9764	9765	9766	9767	9768
New Sync ‡	9808	9809	9810	9811	9812	9813	9814	9815
Modem Clocking	9609	9610	9611	9612	9613	9614	9615	9616

Select modem clocking feature for each line position for which Terminal Adapter Type III is specified and operation at 2400 bps is desired.

**TABLE 1-E
OPTIONS FOR SYNCHRONOUS
DATA ADAPTER TYPE II**

FEATURE	Line Position							
	1	2	3	4	5	6	7	8
Transparency ‡	9673	9674	9675	9676	9677	9678	9679	9680
600 BPS ‡	9601	9602	9603	9604	9605	9606	9607	9608
Swchd Ntwk Facility ‡	9625	9626	9627	9628	9629	9630	9631	9632
Half Duplex Facility ‡	9617	9618	9619	9620	9621	9622	9623	9624
Tributary Station ‡	9665	9666	9667	9668	9669	9670	9671	9672
New Sync ‡	9808	9809	9810	9811	9812	9813	9814	9815
Autocall	9777	9778	9779	9780	9781	9782	9783	
EON ‡	9801	9802	9803	9804	9805	9806	9807	

Select features required for each line position for which Synchronous Data Adapter Type II is specified.

OPTIONAL PRIMARY DATA CODES

ASCII ‡	9681	9682	9683	9684	9685	9686	9687	9688
---------	------	------	------	------	------	------	------	------

Select one of the above data codes if required in lieu of EBCDIC for each line position for which Synchronous Data Adapter Type II is specified.

OPTIONAL ALTERNATE DATA CODES

ASCII ‡	9705	9706	9707	9708	9709	9710	9711	9712
6-Bit Transcode (1) ‡	9713	9714	9715	9716	9717	9718	9719	9720

Select one of the above Alternate Data Codes if required for each line position for which Synchronous Data Adapter Type II is specified.

**TABLE 1-F
OPTIONS FOR TELEGRAPH ADAPTER TYPE II**

FEATURE	Line Position							
	1	2	3	4	5	6	7	8
Tel Adptr Type II ‡	9785	9786	9787	9788	9789	9790	9791	9792
Autocall	9777	9778	9779	9780	9781	9782	9783	
Swchd Ntwk Facility ‡	9625	9626	9627	9628	9629	9630	9631	9632

(1) 6-Bit Transcode can be used only with a 2780 Data Transmission Terminal.

‡ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.



3135-3 Processing Unit (cont'd)

TABLE 2 -- Part I

FEATURES REQUIRED FOR START/STOP TERMINALS

Terminal	IBM Modem	Line Speed (Bits/sec)	Communication Line and Modem Facilities	Features Required
1050 Data Communication System		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility
			D1	Terminal Adapter Type I Model II
2260 Display Station Model 1			Connects via 2848 Display Control Model 3 - see this table	
2260 Display Station Model 2			Connects via 2848 Display Control Model 1 or 2 - see this table	
2265 Display Station Model 1			Connects via the 2845 Display Control Model 1 - see this table	
2740 Communication Terminal Model 1		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility
			D1	Terminal Adapter Type I Model II
2740 Communication Terminal Model 2		134.5	D1	Terminal Adapter Type I Model II
		600	D2	Terminal Adapter Type I Model II; and 600 Bits Per Second
2741 Communication Terminal Model 1 (without interrupt feature)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility
			D1	Terminal Adapter Type I Model II
2741 Communication Terminal Model 1 (with Receive Interrupt Feature)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and Write Interrupt; and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II; and Write Interrupt; and Unit-Exception Suppression (if required)
2741 Communication Terminal Model 1 (with Transmit Interrupt feature)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and Read Interrupt; and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II; and Read Interrupt; and Unit-Exception Suppression (if required)
2741 Communication Terminal Model 1 (with Receive Interrupt and Transmit Interrupt features)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and Write Interrupt; and Read Interrupt; and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II; and Write Interrupt; and Read Interrupt; and Unit-Exception Suppression (if required)
2760 Optical Image Unit Model 1			Connects via 2740 Communication Terminal Model 1 - see this table	
2845 Display Control Model 1 (point-to-point or multipoint)	3872 Model 1	1200	D3	Terminal Adapter Type III multipoint for multipoint operation
		2400	D4	Terminal Adapter Type III and Modem Clocking multipoint for multipoint operation and New Sync (if required)
2848 Display Control Models 1, 2 and 3 (point-to-point or multipoint)	3872 Model 1	1200	D3	Terminal Adapter Type III multipoint for multipoint operation
		2400	D4	Terminal Adapter Type III and Modem Clocking multipoint for multipoint operation and New Sync (if required)
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (without interrupt feature)		300	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and 300 Bits Per Second Line Speed
			D1	Terminal Adapter Type I Model II; and 300 Bits Per Second Line Speed
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Receive Interrupt feature)		300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II, and Write Interrupt, and 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Transmit Interrupt feature)		300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, and Read Interrupt, and 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II, and Read Interrupt, and 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Receive Interrupt and Transmit Interrupt features)		300	C1	Terminal Adapter Type I Model II, Switched Network Facility, Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II, and Write Interrupt, and Read Interrupt, and 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
3767 Communications Terminal Model 1 or 2 with (#7111) - 2740-1 Line Control		300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, and 300 Bits Per Second Line Speed
			D1	Terminal Adapter Type I Model II, and 300 Bits Per Second Line Speed
3767 Communications Terminal Model 1 or 2 or 3 with (#7112) - 2740-2 Line Control		600	D2	Terminal Adapter Type I Model II, and 600 Bits Per Second Line Speed
System/7		134.5	C1	Terminal Adapter Type I Model II, and Switched Network Facility
			D1	Terminal Adapter Type I Model II
		600	D2	Terminal Adapter Type I Model II, and 600 Bits Per Second Line Speed



3135-3 Processing Unit (cont'd)

TABLE 2 -- Part 1 (cont'd) FEATURES REQUIRED FOR START/STOP TERMINALS

5100/5110 Computer Systems	134.5	C1	Terminal Adapter Type I Model II, and Switched Network Facility, Read Interrupt, Write Interrupt, and Unit-Exception Suppression (if required)
		D1	Terminal Adapter Type I Model II, and Read Interrupt, Write Interrupt, and Unit-Exception Suppression (if required)
	300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
		D1	Terminal Adapter Type I Model II, and Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
TTY 33/35	110	C2	Telegraph Adapter Type II

TABLE 2 -- Part 2 FEATURES REQUIRED for BINARY SYNCHRONOUS TERMINALS

Line Speed (Bits/Sec)	IBM Modem	Manner of Line Operation	Communication Line and Modem Facilities	Features Required
600		Point-to-Point	D3 (two-wire)	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Half Duplex Facility, and Data Code Features
			D2 (four-wire)	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features
			C3	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Switched Network Facility, and Data Code Features
				Multipoint -- 3135 as Control Station	D2 (four-wire)	Synchronous Adapter Type II, and 600 Bits Per Second, and Data Code Features
		Multipoint -- 3135 as Tributary Station	D2 (four-wire)	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Tributary Station, and Data Code Features
1200		Point-to-Point	D3 (two-wire)	Synchronous Data Adapter Type II, and Half Duplex Facility, and Data Code Features
			D3 (four-wire)	Synchronous Data Adapter Type II, and Data Code Features
			C4	Synchronous Data Adapter Type II, and Switched Network Facility, and Data Code Features
				Multipoint -- 3135 as Control Station	D3 (four-wire)	Synchronous Data Adapter Type II, and Data Code Features
		Multipoint -- 3135 as Tributary Station	D3 (four-wire)	Synchronous Data Adapter Type II, and Tributary Station, and Data Code Features
2400	3863	Point-to-Point	D4	Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Switched Network Facility; and Data Code Features
2400	3863	Multipoint - 3135 as Control Station	D4	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync (if required)
24003863		Multipoint - 3135 as Tributary Station	D4	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
2400	3872 Model 1	Point-to-Point	C5	Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Switched Network Facility; and Data Code Features
2400	3872 Model 1	Point-to-Point	D4 (two-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Data Code Features
			D4 (four-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3135 as Control Station	D4 (four-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync (if required)
		Multipoint - 3135 as Tributary Station	D4 (four-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
		Point-to-Point, Multipoint	X1M	Synchronous Data Adapter Type II, Modem Clock, Data Code Feature
4800	3864	Point-to-Point	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Switched Network Facility; and Data Code Features
4800	3864	Multipoint - 3135 as Control Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync (if required)
4800	3864	Multipoint - 3135 as Tributary Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
4800	3874 Model 1	Point-to-Point	C6	Synchronous Data Adapter Type II; and Modem Clocking; and Switched Network Facility; and Data Code Features
		Point-to-Point	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3135 as Control Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync
		Multipoint - 3135 as Tributary Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
		Point-to-Point, Multipoint	X2M	Synchronous Data Adapter Type II, Modem Clock, Data Code Feature
7200	3875 Model 1	Point-to-Point	D6 (with C2 conditioning)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3135 as Control Station	D6 (with C2 conditioning)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3135 as Tributary Station	D6 (with C2 conditioning)	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features

**IBM 3138 PROCESSING UNIT**

Purpose: Provides main and control storage plus arithmetic and logic circuits for the S/370 mdl 138.

Model I 524,288 bytes of processor storage

Model J 1,048,576 bytes of processor storage.

Highlights: 524,288 bytes or 1,048,576 bytes of processor storage are provided. CPU cycle time ranges from 275 to 1485 nanoseconds depending on the internal operation being performed. Sixteen general purpose and four floating point registers are provided.

Standard Features Include: Conditional Swapping ... APL Assist ... Audible Alarm ... Byte Oriented Operand ... 1 Byte Multiplexer Channel ... 64 Byte Multiplexer Subchannels ... 2 Block Multiplexer Channels ... 16 Non-Shared Block Multiplexer Subchannels ... 1 Shared Block Multiplexer Subchannel ... Channel Command Retry ... Channel Indirect Addressing ... Clock Comparator & CPU Timer ... Console File ... Control Registers ... Dynamic Address Translation ... Error Checking and Correction (on Main and Control Storage) ... Extended Control Mode ... Extended Control-Program Support ... Extended Precision Floating Point ... Instruction Retry ... Floating Point ... Interval Timer ... Machine Check Handling ... OS/DOS Compatibility ... Program Event Recording ... Storage Protection (Store and Fetch) ... S/370 Universal Instruction Set ... Time of Day Clock ... PSW Key Handling.

Control Storage: 131,072 bytes of Reloadable Control Storage are provided in addition to main storage. This permits emulator and control routines to function. The Reloadable Control Storage is housed in the CPU and is loaded from the Console File. Reloadable Control Storage is not available to the user.

Virtual Storage: Virtual Storage capability is provided to increase the effective utilization of main storage.

Console File (Standard): This is the basic microprogram loading device for the system. The console file contains a small file device that provides all of the microcode for the system on removable magnetic disks. The several disks that will be supplied with the system will supply all of the required microcode for FE diagnostics, basic systems features, plus the optional features ordered for the system.

Console Function: A display console is standard ... includes a cathode ray tube, and a keyboard ... functions as an operator's I/O console to communicate with the operating system ... standard attachment for an optional 3286 Printer mdl 2 or 3287 Printer mdl 1 or 2 for hard copy output. CRT can accommodate twenty-four 80-character lines of information. A system control panel is also located on the 3138 for additional operator communication with the system. Three console modes are available: "Keyboard-Printer" Mode, "Display" Mode, "115/125 Console-Display-Emulation" Mode.

In "Printer-Keyboard" mode, the display console uses the keyboard for input and the CRT and a recommended 3286 Printer mdl 2 or 3287 mdl 1 and 2 for output. The CRT, keyboard and printer appear to the system as a 3215 Console Printer-Keyboard. "Printer-Keyboard" mode is supported by DOS, DOS/VS, OS/360, OS/VS and VM/370.

In "Display" mode, the keyboard is used for input, the CRT with 24 lines by 80 characters/line for output, and DIDOCS or equivalent support is required. DOS/VS does not support Display Mode. The 3286 Printer mdl 2 or 3287 Printer mdl 1 or 2 (optional) has a separate address and requires MCS support or equivalent. When present the printer appears to the system as a 3213 Console Printer.

In "115/125 Console-Display-Emulation" mode, the keyboard is used for input, the CRT is used for output, and the CRT displays twelve, 56-character lines of information. The 3286 Printer mdl 2 or 3287 mdl 1 or 2 are optional. When present, the printer emulates a 5213 Printer mdl 1 and acts as a slave unit to the display console. That is, the 3286 mdl 2 or 3287 mdl 1 or 2 are not separately addressable in this mode. The "115/125 Console-Display-Emulation" mode is available in DOS/VS Rel. 28 and above.

The display console provides the capability to select three aspects of the system's environment at IMPL time:

Console mode - See above (Mode Descriptions)

CPU mode (3138 or 3135) - See Programming Features

Unit addresses of natively attached I/O

Integrated Communications Adapter Line Characteristics - See Integrated Communications Adapter Features

These selections will be recorded on the console file for permanent reuse until such time as any new selection is made during a subsequent IMPL. (Note: This is the only user access to the con-

sole file.) A right reading board extension is standard ... a left extension is not available.

Input/Output Channels:

Byte Multiplexer Channel: One is standard ... functionally equivalent to the byte multiplexer channel on the S/370 mdl 135 ... provides eight control unit positions ... in byte mode, permits simultaneous operation of many low-speed devices ... burst mode operation of unbuffered devices operating in excess of 10KB is not allowed for concurrent operation with the Integrated File Adapter, the Integrated Communications Adapter, or a Block Multiplexer Channel - see *IBM S/370 Model 138 Channel Characteristics Manual, GA24-3633* for further clarification ... for OS exclusion refer to SRL GC28-6554, "System Generation."

Block Multiplexer Channels: Two are standard ... data rates are 1.3 megabytes per second ... permits simultaneous operation of high-speed devices ... ability to "Block Multiplex" provides greater channel efficiency and increases the efficiency of the 3330/3340 Series IFA when using direct access storage devices equipped with rotational position sensing ... devices on these channels which cannot utilize block multiplexing will function as if attached to selector channels ... if the 3330/3340 Series Integrated File Adapter is present these channels are addressed as 2 and 3 respectively. Otherwise they are addressed as 1 and 2.

Subchannels: On the byte multiplexer channel 64 subchannels are provided as standard with the option of 128 or 256 (see "Special Features") ... for each of the two standard block multiplexer channels 16 non-shared subchannels and 1 shared selector subchannel are provided as standard with the option of 8 non-shared and 9 shared or 8 non-shared and 5 shared (see "Special Features") ... each of the standard single shared subchannels may attach a control unit having a maximum of 16 device addresses.

Non-Native: A wide variety of I/O devices may be attached to the S/370 model 138 via the standard byte multiplexer channel or any of the 2 standard block multiplexer channels.

Native: The following integrated I/O attachments/adapters are provided for controlling the designated I/O devices.

Integrated 3203-4 Printer Attachment, First Printer (Optional) Provides the capability to natively attach the 3203 Printer mdl 4 as the first systems printer. The Universal Character Set feature is standard on the 3203.

Integrated 3203-4 Printer Attachment, Second Printer (Optional) - Provides the capability to natively attach the 3203 Printer mdl 4 as the second systems printer. The Universal Character Set feature is standard on the 3203.

Integrated 1403 Printer Adapter (Optional) - This feature allows native attachment of a 1403 Printer mdl 2, 7, or N1 ... the Universal Character Set Feature can be optionally specified on the 1403 mdl 2 or N1.

Integrated Console Printer Adapter (Standard) - Provides the capability to natively attach the optional 3286 Printer mdl 2, 3287 mdl 1 and 2 as a hard copy console printer.

3330/3340 Series Integrated File Adapter (Optional) - This feature allows the native attachment of one or two 3333 modules or 3340 mdl A2 units ... each 3333 module (either mdl 1 or mdl 11) can attach up to three 3330 modules (any combination of mdls 1, 2 or 11) ... each 3340 mdl A2 can attach 3340 mdl B2 or B1 units, and one 3340 mdl A2 can also attach 3344 units to a maximum of eight drives ... maximum is sixteen drives per IFA.

Integrated Communications Adapter (Optional) - This feature provides attachment of up to eight teleprocessing lines to the S/370 mdl 138 ... these may be any combination of supported BSC and Start/Stop lines and appear to the processor as if connected via one or more 2701s on the byte multiplexer channel.

Integrated Communications Adapter Features: To improve the ordering of the ICA on the S/370 mdl 138 the user may define, from the display-console-keyboard, the following line characteristics for each line installed (a maximum of 8 lines are attachable to the ICA):

[1] Leased Facility* or Switched Network Facility: Allows the Terminal Adapter Type I Model II, Synchronous Data Adapter Type II (SDA), or Telegraph Adapter Type II to operate over leased or C type switched lines.

[2] Half Duplex Facility or Full Duplex Facility* - Allows the user to make a business tradeoff between his TP applications and turn-around requirements and available teleprocessing facilities

* These options will comprise the standard microcode on the console file as shipped from the plant. They may be altered as explained from the display-console-keyboard at the operator's discretion.

3138 Processing Unit (cont'd)

and the cost of those facilities ... half-duplex is required if the Synchronous Data Adapter Type II is attached to a two-wire facility or that facility is part of a switched network unless that facility is a leased line and the Synchronous Data Adapter Type II is installed and functioning as a tributary station and not functioning as a control station on that leased line.

- [3] Primary Code for the SDA Type II (EBCDIC*, ASCII, 6-Bit)
- [4] Secondary or Alternate Code for the SDA Type II (EBCDIC*, ASCII, 6-Bit)
- [5] Tributary Station Address - Allows the user to specify a station address A to R of any Synchronous Data Adapter Type II which is installed and functioning on a leased communications line as a tributary station and not functioning as a control station on that leased line. (Station address 0829*). Only addresses A to R are valid.
- [6] Line Speed
 - (a) 134 bps*, 300 bps, or 600 bps for Terminal Adapter Type 1 Model II.
 - (b) 600 bps or 1200 bps* for Synchronous Data Adapter Type II.
 - (c) Not applicable for Terminal Adapter Type III or Telegraph Adapter Type II.
- [7] Transparency - Yes or No* - Provides the SDA Type II with the ability to transmit and receive 8-bit binary as well as EBCDIC or ASCII codes or 6-bit binary data as well as 6-bit Transcode ... Transparency with ASCII modifies VRC/LRC checking to VRC/CRC Checking ... **LIMITATION:** ASCII code and Transparency cannot be installed together for the same line position when attached to the 2770, 2780, 3735, 3780, System/3, System/7, System/32 or System/34 ... **PREREQUISITE:** SDA II.
- [8] Write Interrupt - Yes or No* - Allows the Terminal Adapter Type I Model II to operate with a 2741 equipped with Receive Interrupt (#4708) ... **LIMITATIONS:** Not supported under BTAM, QTAM, or TCAM ... **PREREQUISITE:** Terminal Adapter Type I Model II.
- [9] Read Interrupt - Yes or No* - Allows the Terminal Adapter Type I Model II to operate with a 2741 equipped with Transmit Interrupt (#7900) ... **LIMITATIONS:** Not supported under BTAM, QTAM, or TCAM ... **PREREQUISITE:** Terminal Adapter Type I Model II.
- [10] New SYNC - Yes or No* - Allows the Synchronous Data Adapter Type II or Terminal Adapter Type III to be connected to modems which offer the New Sync feature option and have this option installed ... New Sync minimizes modem turnaround and allows faster bit synchronization of the following data ... **PREREQUISITES:** Modem Clocking (#9606-9616), and a modem offering New Sync. **NOTE:** New Sync is not required if Half Duplex Facility, Tributary Station, or Switched Network is selected for the line position in question.
- [11] Multipoint - Yes or No* - Specifies that a Terminal Adapter Type III is to operate in multipoint mode. If multipoint is not selected for a given Terminal Adapter Type III, point-to-point operation is presumed. **PREREQUISITE:** Terminal Adapter Type III.
- [12] Unit Exception Suppression - Yes or No* - If selected with Terminal Adapter Type 1 Model II, Unit Exception will not be set in response to a Circle C ... **LIMITATION:** Not supported under BTAM, QTAM, or TCAM ... **PREREQUISITE:** Terminal Adapter Type 1 Model II.

Note: See "Special Features" for optional "ICA features" on the S/370 model 138.

Programming Features:

Conditional Swapping (Standard): Provides two additional instructions ... Compare and Swap ... Compare Double and Swap.

PSW Key Handling (Standard): Provides two additional instructions ... Insert PSW Key ... Set PSW Key from Address.

APL Assist (Standard): This feature is an APL emulator. It replaces functions performed by the APL software interpreter. This feature can provide a performance improvement for many APL applications when used with VS APL PP #5748 AP1.

IMPL 3135 CPU Mode Selection: Provides the capability to "run" on S/370 mdl 138 any SCP which will "run" today on a S/370 mdl 135. No performance degradation or loss of S/370 mdl 135 recovery from error capabilities will be experienced in this mode. That is, in 3135 CPU Mode the improved hardware

* These options will comprise the standard microcode on the console file as shipped from the plant. They may be altered as explained from the display-console-keyboard at the operator's discretion.

performance of the S/370 mdl 138 will be available to the user. Moreover the user will have the same recovery capabilities on the S/370 mdl 138 as he has on a S/370 mdl 135 when 3135 CPU Mode is selected. **NOTE:** S/370 mdl 138 Extended Logout/EREP is not supported in this mode.

Extended Control Program Support (Standard): The S/370 model 138 includes Extended Control-Program Support. This is a hardware assist that reduces the CPU time needed to execute certain frequently used supervisor functions in both VS-1 and VM/370.

The functional areas for VM/370 include:

- Virtual Machine I/O
- Storage Management
- Page Management
- SVC Handler
- Privileged Instruction Interfaces
- Dispatching
- Virtual Interval Timer

For VS-1 the functional areas are:

- Storage Management
- IOS
- SVC FLIH
- System Trace
- Page Management

Prerequisite: Each S/370 mdl 138 requires a 3046 power unit ... see 3046.

Bibliography: GC20-0001

Specify:

- [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
- [2] Cabling #9080 for below the floor, or #9081 for on the floor.
- [3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- [4] Minimum Configuration: See "Minimum Configurations" in "Systems" for minimum I/O units required in S/370 mdl 138.
- [5] Shipping Instructions: Unless otherwise specified, shipping dimensions of the 3138 Frame 01 (CPU) are 21-1/2" wide x 70" long x 60" high. Removal of the side covers will reduce the width to 29-1/2". If further reduction in length is required, specify #9570. Shipping dimensions will then be 29-1/2" wide x 60" long x 60" high.

NOTE: RETAIN/370 ... CE access is by telephone.

Prices:	Mdl	MRC	MLC 4 Yr	Purchase	MMMC
3138	I	\$ 9,600	\$ 8,730	\$222,900	\$1,275
	J	11,120	10,115	260,400	1,335

MRC M
23.2 2
23.4 2

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit Machine Group: A Per Call: 3
Purchase Option: 55% Useful Life Category: 2 Warranty: A
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model I to Model J \$37,500

SPECIAL FEATURES

BLOCK MULTIPLEXER SHARED SUBCHANNEL (#1431). Note: This feature should be installed only if devices capable of "Block Shared" operation are installed on the block multiplexer channel. See 370 I/O Configuration Form GA22-7002. Allows any one of the following combinations of "Non-Shared," "Block Shared" or selector subchannels to be attached to the block multiplexer channel: [1] 16 Non-Shared and 1 Shared Selector (see address restrictions) ... [2] 8 Non Shared, 8 Block Shared and 1 Shared Selector (see address restrictions) ... [3] 8 Non-Shared, 4 Block Shared and 1 Shared Selector (see address restrictions). If option [2] is selected, then each block shared subchannel may have attached to it a control unit having a maximum of 16 device addresses. If option [3] is selected, the four block shared subchannels may each have attached a control unit having a maximum of 32 device addresses. If option [1] is selected, no block shared subchannels are available, and addresses X00 through X7F are not available. With any option, the selector subchannel may have attached to it control units with a maximum of 16 device addresses. This feature will apply to both selector channels if installed. The options are selectable by the Customer Engineer and may be



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defined differently on each channel. **Maximum:** One. **Field Installation:** Yes.

Address Restrictions with #1431

- a) Addresses X00 through X7F are assigned as block shared subchannels. With option [1] they may not be used. With option [2] each control unit address position, i.e., X00, X10, X20, etc., through X70 is available. With option [3] "even" address positions only are available, i.e., 00, 20, 40 and 60.
- b) Selector and Non-Shared addresses are limited to addresses X80 through XFF.

CHANNEL PRIORITY (#1502). When the IFA (#4655) is present, this feature changes the higher priority for command chaining from the first block multiplexer channel (Channel 2) to the second block multiplexer channel (Channel 3). #1502 is required if any DASD devices are to be attached to Channel 3. **Field Installation:** Yes. **Prerequisite:** Integrated File Adapter (#4655).

DIRECT CONTROL (#3274). Provides two instructions, Read Direct and Write Direct, and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in S/360 Direct Control Feature - OEMI, GA22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide a single emergency power-off switch in a "room" or "area". See Emergency Power-Off Control under S/370 ... #3622 -- to interconnect up to twelve emergency power-off switches. **Field Installation:** Yes.

MULTIPLEXER SUBCHANNELS, ADD'L (#3906, 3907). To increase the number of I/O devices on the byte multiplexer channel, the number of subchannels can be increased by specifying one of the following: ... #3906 -- for 128 subchannels ... #3907 -- for 256 subchannels. The maximum number of shared subchannels is eight. When 256 subchannels are installed there are no shared subchannels. **Note:** The number of subchannels ordered must be equal to or greater than the device addresses. Also see "Byte Multiplexer Channel" under "Input/Output Channels" above. **Field Installation:** Yes.

1401/1440/1460 COMPATIBILITY (#4457). Microprogrammed controlled feature, which, in conjunction with special software, permits the system to execute 1401/1440/1460 instructions. **Field Installation:** Yes.

3330/3340 SERIES INTEGRATED FILE ADAPTER (#4655). Permits native attachment of up to two 3333s or 3340 mdl A2s. A maximum of sixteen 3330 or 3340 series drives can be attached to the IFA. The IFA supports rotational position sensing, disconnected command chaining and multiple requesting. Record overflow is standard. For 3330, standard I/O addresses are (hex) 150 thru 15F. For 3340, standard addresses are (hex) 1C0 thru 1CF. For 3340 with 3344, standard addresses are (hex) 1C0 thru 1E1. **Maximum:** One. **Field Installation:** Yes.

Specify:

- [1] DASD Designation -- Specify ONE of the following -- #9313 (DASD 3333/3330) to attach up to two 3333 mdl 1s, each with up to three 3330 mdls 1/2 in any combination ... #9314 (DASD 3340 only) to attach up to two 3340 mdl A2s, each with up to three 3340 mdls B1/B2 in any combination ... #9315 (3333/3340 Intermix) to attach one 3333 mdl 1 (with up to three 3330 mdls 1/2 in any combination) plus one 3340 mdl A2 (with up to three 3340 mdls B1/B2 in any combination).
- [2] If any 3333 mdl 11 and/or 3330 mdl 11 is to be attached, also specify #9316 (3333/3330 mdl 11) in addition to #9313 or #9315.

With #9313 plus #9316, a mixture of one 3333 mdl 1 and one 3333 mdl 11, each with up to three 3330 mdls 1, 2, and 11 (in any combination) can be attached ... or two 3333 mdl 11s, each with any mixture of up to three 3330 mdls 1, 2 and 11.

With #9315 plus #9316, one 3333 (either mdl 1 or mdl 11) with up to three 3330 mdls 1, 2 and 11 (in any combination) can be attached in addition to one 3340 mdl A2 with up to three associated mdls B1/B2. The standard addresses with #9315 for 3330 are (hex) 150 thru 157, for 3340 (hex) 158 thru 15F.
- [3] If any 3344 is to be attached specify #9317 in addition to #9314 (#9317 and #9315 are mutually exclusive). #9190 must also be specified if 3344 mdl B2Fs or the 3340 Fixed Head Feature (#4301/4302) is ordered.

With #9314, #9317, and #9190 up to three 3344 mdl B2/B2F and/or 3340 mdl B2, B1 units in any combination can be attached to one 3340 mdl A2. The second 3340 mdl A2 if present can attach up to three 3340 mdl B1/B2 units.

- [4] When #9314 is specified, also specify 3340 Address Designation: #9820 for addresses (hex) 1C0 thru 1CF, or #9821 for addresses (hex) 160 thru 16F. The specification of 160 allows the 3138 IFA addresses to coincide with those of the 3115 and 3125 IFAs.
- [5] When #9314 or #9315 is specified, also specify #9190 (Fixed Head Attachment) if Fixed Head Feature (#4301/4302) is ordered for any 3340 attached to the IFA.
- [6] If String Switch (#8150) is ordered for any attached 3333 or 3340 mdl A2, specify String Switch Attachment (#9841).
- [7] When #9821 is specified in conjunction with #9313 the addresses for the 3333/3330s are (HEX) 160 thru 16F.
- [8] When #9821 is specified and both #9314 and #9317 are specified the addresses for the 3340/3344s are as follows:

	3340 A2		----- 3344 B2/B2Fs -----							
String 0	160	161	162	163	164	165	166	167	168	169
			172	173	174	175	176	177		
			1E2	1E3	1E4	1E5	1E6	1E7		
			1F2	1F3	1F4	1F5	1F6	1F7		
Physical Drive	0	1	2	3	4	5	6	7		
	3340 A2		----- 3340 B2s -----							
String 1	168	169	16A	16B	16C	16D	16E	16F		

Note: The DASD control combinations that can be attached to the 3330/3340 Series IFA (#4655) are shown in the left hand column of the table below. From Section A of the table select one of the feature numbers shown (one and only one must be selected). From Section B select the feature number(s) required to support your configuration (select none, one or more than one from Section B). Section C of the table shows the addresses available. The specification of the (HEX) 160 addresses allows the 3138 IFA addresses to coincide with those of the 3115 and 3125 IFA. Select a number from Section C if required.

§ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.



3138 Processing Unit (cont'd)

3138, 3330/3340 IFA (#4655)

	SECTION A		SECTION B					SECTION C	
	DASD Designation, one req'd	If any 3333 Mdl 11 and/or 3330 Mdl 11	3344	3344 Mdl B2F	Fixed Head Feature (#4301/4302) on 3340	String Switch #8150 on 3333/3340	2314/3340 Compatibility Feature (see #8070)	ADDRESSES	
DASD Control Combinations on IFA (#4655)							Standard	Address 160	
3333 Disk Storage Control	9313 \$	9316\$	--	--	--	9841 \$	--	* HEX 150-15F	9821 \$ HEX 160-16F
3333/3340 Inter-mix	9315 \$	9316 \$	--	--	9190 \$	9841 \$	--	*3330 HEX 150-157 3340 HEX 158-15F	--
3340 Direct Access Storage Facility	9314 \$	--	9317 \$	9317 \$ + 9190 \$	9190 \$	9841 \$	** 8070	9820 \$ Not 3344 HEX 1C0-1CF	9821 \$ Not 3344 HEX 160-16F
								3344 HEX 1C0-1E1	See Item 8 above

* No feature number required.

** Mutually exclusive with String Switch #9841, 2319 IFA (#4650), IFA Conversion feature (#4645), 3344 Attachment (#9317).

INTEGRATED 1403 PRINTER ADAPTER BASIC CONTROL (#4670). Provides the power supply and basic control for a natively attached 1403 Printer. **Maximum:** One. **Field Installation:** Yes.

INTEGRATED 1403 PRINTER MDL 2, MDL N1 ATTACHMENT (#4672). Provides control for attaching 1403 mdl 2 or N1. **Specify:** #9182\$ to attach 1403 mdl 2, #9188\$ to attach 1403 mdl N1. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Integrated Printer Adapter Basic Control (#4670). On the 1403, Voltage Adapter (#9709) and 600 LPM Voltage Conversion Adapter (#9725) are required on a mdl 2; 1100 LPM Voltage Conversion Adapter (#9725) is required on a mdl N1. See Specify under 1403.

INTEGRATED 1403 PRINTER MDL 7 ATTACHMENT (#4677). Provides control for attaching a 1403 mdl 7. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Integrated Printer Adapter Basic Control (#4670). On the 1403, 600 LPM Voltage Conversion Adapter (#9725) is required on a mdl 7. See Specify under 1403.

S/360 MODEL 20 COMPATIBILITY (#7520). Microprogrammed controlled feature which, in combination with special software, permits the system to execute S/360 mdl 20 or S/360 mdl 25 in mdl 20 mode instructions. **Field Installation:** Yes.

2314/3340 COMPATIBILITY FEATURE (#8070). Permits the emulation of 2314/2319 volumes on the 3340 Disk Storage. The user program may access both the emulated 2314 data set as well as 3340 volumes. This provides a "mixed-mode" operating environment. "Mixed-mode" is only possible with DOS releases which support 3340 on the mdl S/370 mdl 138. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with 3333/3340 Inter-mix (#9315), 3344 Attach (#9317), or String Switch Attachment (#9841). **Prerequisite:** #9314 (DASD 3340 only), on 3330/3340 Series IFA (#4655).

INTEGRATED 3203-4 PRINTER ATTACHMENT, FIRST PRINTER (#8075). Provides the capability to natively attach the 3203 Printer mdl 4. **Maximum:** One. **Field Installation:** Yes.

INTEGRATED 3203-4 PRINTER ATTACHMENT, SECOND PRINTER (#8076). Provides the capability to natively attach a second 3203 Printer mdl 4. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Integrated 3203-4 Printer Attachment, First Printer (#8075).

UNIVERSAL CHARACTER SET ADAPTER (#8637). Permits the use of the Universal Character Set feature on a 1403 mdl 2 or N1 attached via the Integrated 1403 Printer mdl 2, mdl N1 Attachment (#4672). **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Integrated Printer Adapter Basic Control (#4670), Integrated 1403 Printer mdl 2, mdl N1 Attachment (#4672).

INTEGRATED COMMUNICATIONS ADAPTER (#4640). Provides the circuits and controls for direct attachment of up to eight teleprocessing lines to the S/370 mdl 138. The controls for the first line adapter are included in this feature. Lines can be any combination of Start/Stop or BSC. Provides for the attachment of 1050, 2260 mdl 1, 2260 mdl 2, 2265 mdl 1, 2740 mdl 1, 2740 mdl 2, 2741 mdl 1, 2760 mdl 1, 5010 Axx, or any IBM computer multiplexer or terminal conforming to the Binary Synchronous Communications (BSC) standard. **Note:** In addition to the appropriate adapter, each communications line attached to the system requires an external modem.

Refer to Table 2 below to define customer configuration require-

\$ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

ments prior to ordering features below. **Customer Responsibilities** -- see M 2700 pages for customer responsibilities regarding communications facilities and servicing requirements. **Communications Facilities** -- see M 2700 pages for communications facility requirements with this feature. **Field Installation:** Yes.

AUTOCALL (#1290). Provides automatic calling capabilities on facilities C1, C2, C4 or C5 to initiate (dial) through stored program control, a data link to a remote station. For the appropriate automatic calling units, see M 2700 pages. **Specify:** Refer to Table 1C for Terminal Adapter Type I Model II or Table 1E for Synchronous Data Adapter Type II or Table 1F for Telegraph Adapter Type II for appropriate feature code according to line positions desired. **Maximum:** Four. **Limitations:** Each Autocall feature installed reduces the number of lines available on the ICA by one. Autocall must be ordered once for each line where the function is desired. Thus, the ICA can accommodate a maximum of four lines if each of these lines also has the Autocall feature. A single Autocall feature can be associated with any of the lines from one to seven. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** Terminal Adapter Type 1 Model II (#9721-9728) or Telegraph Adapter Type II (#9785-9792) and Switched Network Facility selection from the display console.

ADDITIONAL LINES (#4722-4728). Each provides circuits and controls for attachment of an additional line adapter ... for a total of eight lines in a system. **Specify:** Order additional lines according to line position required ... see Table 1-A below. Each line specified requires the next lower order line as a prerequisite. **Maximum:** One of each (#4722 thru #4728). **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

SPECIFY REQUIREMENTS FOR INTEGRATED COMMUNICATIONS ADAPTER. For each line (#4722-4728) attached to the ICA, including the first line included in the Integrated Communications Adapter (#4640), one of the following line adapters must be specified: Terminal Adapter Type 1 Model II (#9721-9728), Terminal Adapter Type III (#9753-9760), Telegraph Adapter Type II (#9785-9792), or Synchronous Data Adapter Type II (#9649-9656). Each line adapter and all associated features must be specified according to the line position to which they correspond. Refer to Table 2 below prior to ordering features for the ICA.

TERMINAL ADAPTER TYPE 1 MODEL II (#9721-9728). Controls data transfers between the 3138 and 1050/2740 mdl 1/2741/5010 mdl Axx over facility C1 or D1, and between the 3138 and 2740 mdl 2 or 5010 mdl Axx over facility D1 or D2. Includes vertical and longitudinal checking for 1050 terminals and 2740s equipped with Record Checking (#6114). **Specify:** Refer to Table 1-B for appropriate feature code according to line position(s) desired. **Special Requirements:** See Table 1-C for additional specify requirements if Autocall is required. **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

TERMINAL ADAPTER TYPE III (#9753-9760). Controls data transfers between the 138 and either remote 2845 Display Controls or 2848 Display Controls operating at 1200 bps over facility D3. Permits operation at 2400 bps over facility D4 if Modem Clocking is specified. **Specify:** Refer to Table 1-B for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

MODEM CLOCKING (#9609-9616). Allows a Terminal Adapter Type III to operate at 2400 bps or a Synchronous Data Adapter Type II to operate at 2000 bps, 2400 bps, 4800 bps or 7200 bps. Requires the appropriate clocking to be in the attached modem. **Note:** Certain modems such as the IBM 3872 mdl 1 although



3138 Processing Unit (cont'd)

basically 2400 bps modems, offer a 1200 bps half speed facility. Since the requirements for the Modem Clocking feature are defined by the type of modem, not the line speed, when such modems are attached to the Synchronous Data Adapter Type II and are switched for 1200 bps operation, Modem Clocking is still required as a prerequisite on the ICA. **Specify:** Refer to Table 1-D for Terminal Adapter Type III or Table 1-E for Synchronous Data Adapter Type II for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisite:** Terminal Adapter Type III or Synchronous Data Adapter Type II.

TELEGRAPH ADAPTER TYPE II (#9785-9792).§ Controls data transfers between ICA and Model 33/35 TTY terminals (8 level code at 110 bps only) with facility C2. **Specify:** Refer to Table 1-B for appropriate feature code according to line position(s) desired. **Field Installation:** Yes. **Prerequisites:** Integrated Communications Adapter (#4640) and Switched Network Facility selection from the display console.

SYNCHRONOUS DATA ADAPTER TYPE II (#9649-9656).§ Provides control of data transfers between the 3138 and binary synchronous terminals. See "Binary Synchronous Terminals" under 2701 Data Adapter Unit. Control Station is included with this feature. **Specify:** Refer to Table 1-B for appropriate feature code according to line position(s) desired. **Speed Selection:** Provides operation over C3, D2 and D3 facilities at 600 bps if 600 Bits Per Second is selected from the display console. Provides operation over C4 and D3 facilities at 1200 bps (no speed need be specified). Provides operation over C5M facility at 2000 bps if modem clocking is provided ... see above. Provides operation over C5, D4 or X1M at 2400 bps, over C6, D5 or X2M at 4800 bps, or over D6 at 7200 bps ... see above. **Field Installation:** Yes. **Prerequisite:** Integrated Communications Adapter (#4640).

SPECIAL REQUIREMENTS: See Table 1-E for additional specify requirements if Autocall or EON are required. See Table 1-E and Modem Clocking above if 2000 bps, 2400 bps, 4800 bps, or 7200 bps operation is required. The appropriate Data Code must be selected from the display console.

LIMITATIONS: For line speed limitations refer to *Model 138 Channel Characteristics Manual GA33-3010*.

EON (#9801-9807).§ Automatically generates an EON digit at the end of the dial sequence. **Specify:** Refer to Table 1-E for appropriate feature code according to line position(s) desired. Specify for 3872 and 3874 Modem with EON option. **Field Installation:** Yes. **Prerequisites:** Autocall (#1290) ... Synchronous Data Adapter Type II.

MODEMS: Up to eight modems can be attached to a 3138. **Prerequisites:** Integrated Communications Adapter (#4640) and Synchronous Data Adapter Type II (#9649-9656) 2400 bps to 7200 bps, Terminal Adapter Type I Model II (#9721-9728) 134.5 bps to 600 bps, or Terminal Adapter Type III (#9753-9760) 1200 bps or 2400 bps. See feature descriptions for limitations.

Modem	Speed (bps)
3863	2400
3872	2400
3864	4800
3874	4800
3875	7200

Note: for communications capabilities, product utilization and special features, see 3863, 3864, 3872, 3874, 3875 and M 2700 pages.

Special Feature Prices:	MLC				
	MRC	4 yr	Purchase	MMMC	
Autocall	#1290*	\$ 56	\$ 51	\$ 2,180	\$ 1.00
Blk Mlplx Shrd Subchnnls	1431	NC	NC	**	NC
Channel Priority	1502	NC	NC	**	NC
Direct Control	3274*	131	120	5,205	1.00
Emergency Power-Off Control					
for 2 switches	3621	NC	NC	NC	NC
for up to 12 switches	3622	NC	NC	NC	NC
Mlplx Subchannels, Add'l					
128 subchannels	3906	NC	NC	**	NC
256 subchannels	3907	NC	NC	**	NC
1401/1440/1460 Compat	4457	NC	NC	**	NC
Int Communications Adptr	4640*	242	220	9,470	25.00
3330/3340 Series IFA	4655*	708	644	19,820	3.00
Int 1403 Prt Adpt Basic Cnt	4670*	400	364	19,850	21.50
Int 1403 Prt-2,-N1 Attach	4672*	10	10	415	.50
Int 1403 Prntr -7 Attach	4677*	10	10	415	.50
Lines , Additional					
Second	4722*	47	43	1,900	5.00
Third	4723*	95	87	3,815	10.00
Fourth	4724*	47	43	1,900	5.00
Fifth	4725*	144	131	5,690	16.00
Sixth	4726*	47	43	1,900	5.00
Seventh	4727*	47	43	1,900	5.00
Eighth	4728*	47	43	1,900	5.00
S/360 Mdl 20 Compatibility	7520	NC	NC	**	NC
2314/3340 Compat Feat	8070*	55	50	1,535	NC
Integrated 3203-4 Printer Attachment,					
First Printer	8075	180	164	4,750	30.00
Second Printer	8076	180	164	4,750	30.00
Universal Char Set Adapter	8637*	40	37	1,630	8.00

* Feature supplies CPU diskette.
** CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. \$405 on purchased machine when combined with changes subject to a distribution fee to include any number of diskette-only changes ordered on the same diskette.

§ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.



3138 Processing Unit (cont'd)

Before ordering, check Special Feature write-ups for Prerequisites and Limitations.

TABLE 1-A ADDITIONAL LINE APPEARANCES

FEATURE	----- Line Position -----							
	1	2	3	4	5	6	7	8
Additional Lines	in 46404722 4723 4724 4725 4726 4727 4728							
	Specify additional lines according to line position.							

TABLE 1-B TERMINAL ADAPTERS

FEATURE	----- Line Position -----							
	1	2	3	4	5	6	7	8
Terminal Adapter Type I Model II ‡	9721	9722	9723	9724	9725	9726	9727	9728
Terminal Adapter Type III ‡	9753	9754	9755	9756	9757	9758	9759	9760
Synchronous Data Adapter Type II ‡	9649	9650	9651	9652	9653	9654	9655	9656
	Any adapter added, removed, or relocated to another line position requires reconfiguration of the entire line.							
	Select one terminal adapter for each line position specified in TABLE 1-A.							

TABLE 1-C OPTIONS FOR TERMINAL ADAPTER TYPE I MODEL II

FEATURE	----- Line Position -----							
	1	2	3	4	5	6	7	8
Autocall	9777	9778	9779	9780	9781	9782	9783	

TABLE 1-D OPTIONS FOR TERMINAL ADAPTER TYPE III

FEATURE	----- Line Position -----							
	1	2	3	4	5	6	7	8
Modem Clocking	9609	9610	9611	9612	9613	9614	9615	9616
	Select modem clocking feature for each line position for which Terminal Adapter Type III is specified and operation at 2400 bps is desired.							

TABLE 1-E OPTIONS FOR SYNCHRONOUS DATA ADAPTER TYPE II

FEATURE	----- Line Position -----							
	1	2	3	4	5	6	7	8
Modem Clocking	9609	9610	9611	9612	9613	9614	9615	9616
Autocall	9777	9778	9779	9780	9781	9782	9783	
EON ‡	9801	9802	9803	9804	9805	9806	9807	
	Select features required for each line position for which Synchronous Data Adapter Type II is specified.							

TABLE 1-F OPTIONS FOR TELEGRAPH ADAPTER TYPE II

FEATURE	----- Line Position -----							
	1	2	3	4	5	6	7	8
Telegraph Adapter Type II ‡	9785	9786	9787	9788	9789	9790	9791	9792
Autocall	9777	9778	9779	9780	9781	9782	9783	

‡ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.



3138 Processing Unit (cont'd)

TABLE 2 - Part 1

FEATURES REQUIRED FOR START/STOP TERMINALS

Terminal	IBM Modem	Line Speed (Bits/sec)	Communication Line and Modem Facilities	Features Required
1050 Data Communication System		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility
			D1	Terminal Adapter Type I Model II
2260 Display Station Model 1			Connects via 2848 Display Control Model 3 - see this table	
2260 Display Station Model 2			Connects via 2848 Display Control Model 1 or 2 - see this table	
2265 Display Station Model 1			Connects via the 2845 Display Control Model 1 - see this table	
2740 Communication Terminal Model 1		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility
			D1	Terminal Adapter Type I Model II
2740 Communication Terminal Model 2		134.5	D1	Terminal Adapter Type I Model II
		600	D2	Terminal Adapter Type I Model II; and 600 Bits Per Second
2741 Communication Terminal Model 1 (without interrupt feature)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility
			D1	Terminal Adapter Type I Model II
2741 Communication Terminal Model 1 (with Receive Interrupt Feature)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and Write Interrupt; and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II; and Write Interrupt; and Unit-Exception Suppression (if required)
2741 Communication Terminal Model 1 (with Transmit Interrupt feature)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and Read Interrupt; and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II; and Read Interrupt; and Unit-Exception Suppression (if required)
2741 Communication Terminal Model 1 (with Receive Interrupt and Transmit Interrupt features)		134.5	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and Write Interrupt; and Read Interrupt; and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II; and Write Interrupt; and Read Interrupt; and Unit-Exception Suppression (if required)
2760 Optical Image Unit Model 1			Connects via 2740 Communication Terminal Model 1 - see this table	
2845 Display Control Model 1 (point-to-point or multipoint)	3872 Model I	1200	D3	Terminal Adapter Type III multipoint for multipoint operation
		2400	D4	Terminal Adapter Type III and Modem Clocking multipoint for multipoint operation and New Sync (if required)
2848 Display Control Models 1, 2 and 3 (point-to-point or multipoint)	3872 Model I	1200	D3	Terminal Adapter Type III multipoint for multipoint operation
		2400	D4	Terminal Adapter Type III and Modem Clocking multipoint for multipoint operation and New Sync (if required)
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (without interrupt feature)		300	C1	Terminal Adapter Type I Model II; and Switched Network Facility; and 300 Bits Per Second Line Speed
			D1	Terminal Adapter Type I Model II; and 300 Bits Per Second Line Speed
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Receive Interrupt feature)		300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II, and Write Interrupt, and 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Transmit Interrupt feature)		300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, and Read Interrupt, and 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II, and Read Interrupt, and 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Receive Interrupt and Transmit Interrupt features)		300	C1	Terminal Adapter Type I Model II, Switched Network Facility, Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
			D1	Terminal Adapter Type I Model II, and Write Interrupt, and Read Interrupt, and 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
3767 Communications Terminal Model 1 or 2 with (#7111) - 2740-1 Line Control		300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, and 300 Bits Per Second Line Speed
			D1	Terminal Adapter Type I Model II, and 300 Bits Per Second Line Speed
3767 Communications Terminal Model 1 or 2 or 3 with (#7112) - 2740-2 Line Control		600	D2	Terminal Adapter Type I Model II, and 600 Bits Per Second Line Speed
System/7		134.5	C1	Terminal Adapter Type I Model II, and Switched Network Facility
			D1	Terminal Adapter Type I Model II
		600	D2	Terminal Adapter Type I Model II, and 600 Bits Per Second Line Speed



3138 Processing Unit (cont'd)

TABLE 2 -- Part 1 (cont'd) FEATURES REQUIRED FOR START/STOP TERMINALS

5100/5110 Computer Systems	134.5	C1	Terminal Adapter Type I Model II, and Switched Network Facility, Read Interrupt, Write Interrupt, and Unit-Exception Suppression (if required)
		D1	Terminal Adapter Type I Model II, and Read Interrupt, Write Interrupt, and Unit-Exception Suppression (if required)
	300	C1	Terminal Adapter Type I Model II, and Switched Network Facility, Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
		D1	Terminal Adapter Type I Model II, and Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)
TTY 33/35	110	C2	Telegraph Adapter Type II

TABLE 2 -- Part 2 FEATURES REQUIRED for BINARY SYNCHRONOUS TERMINALS

Line Speed (Bits/Sec)	IBM Modem	Manner of Line Operation	Communication Line and Modem Facilities	Features Required
600		Point-to-Point	D3 (two-wire)	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Half Duplex Facility, and Data Code Features
			D2 (four-wire)	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features
			C3	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Switched Network Facility, and Data Code Features
				Multipoint -- 3138 as Control Station	D2 (four-wire)	Synchronous Adapter Type II, and 600 Bits Per Second, and Data Code Features
		Multipoint -- 3138 as Tributary Station	D2 (four-wire)	Synchronous Data Adapter Type II, and 600 Bits Per Second, and Tributary Station, and Data Code Features
1200		Point-to-Point	D3 (two-wire)	Synchronous Data Adapter Type II, and Half Duplex Facility, and Data Code Features
			D3 (four-wire)	Synchronous Data Adapter Type II, and Data Code Features
			C4	Synchronous Data Adapter Type II, and Switched Network Facility, and Data Code Features
				Multipoint -- 3138 as Control Station	D3 (four-wire)	Synchronous Data Adapter Type II, and Data Code Features
		Multipoint -- 3138 as Tributary Station	D3 (four-wire)	Synchronous Data Adapter Type II, and Tributary Station, and Data Code Features
2400	3863	Point-to-Point	D4	Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Switched Network Facility; and Data Code Features
2400	3863	Multipoint - 3138 as Control Station	D4	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync (if required)
2400	3863	Multipoint - 3138 as Tributary Station	D4	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
2400	3872 Model I	Point-to-Point	C5	Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Switched Network Facility; and Data Code Features
2400	3872 Model I	Point-to-Point	D4 (two-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Data Code Features
			D4 (four-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3138 as Control Station	D4 (four-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync (if required)
		Multipoint - 3138 as Tributary Station	D4 (four-wire)	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
		Point-to-Point, Multipoint	X1M	Synchronous Data Adapter Ty II, Modem Clock, Data Code Feature
4800	3864	Point-to-Point	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Switched Network Facility; and Data Code Features
4800	3864	Multipoint - 3138 as Control Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync (if required)
4800	3864	Multipoint - 3138 as Tributary Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
4800	3874 Model I	Point-to-Point	C6	Synchronous Data Adapter Type II; and Modem Clocking; and Switched Network Facility; and Data Code Features
			D5	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3138 as Control Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features; and New Sync
		Multipoint - 3138 as Tributary Station	D5	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features
		Point-to-Point, Multipoint	X2M	Synchronous Data Adapter Ty II, Modem Clock, Data Code Feature
7200	3875 Model I	Point-to-Point	D6 (with C2 conditioning)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3138 as Control Station	D6 (with C2 conditioning)	Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features
		Multipoint - 3138 as Tributary Station	D6 (with C2 conditioning)	Synchronous Data Adapter Type II; and Modem Clocking; and Tributary Station; and Data Code Features

**IBM 3145 PROCESSING UNIT**

Purpose: Has program, control and auxiliary storage, plus arithmetic and logic circuits for a S/370 mdl 145.

Model GE	163,840 bytes of processor storage.
Model GFD	212,992 bytes of processor storage.
Model H	262,144 bytes of processor storage.
Model HG	393,216 bytes of processor storage when used with a 3345 mdl 1 or 4.
Model I	524,288 bytes of processor storage when used with a 3345 mdl 2 or 5.
Model H2	262,144 bytes of processor storage.
Model HG2	393,216 bytes of processor storage.
Model I2	524,288 bytes of processor storage.
Model IH2	786,432 bytes of processor storage.
Model J2	1,048,576 bytes of processor storage.
Model JI2	1,572,864 bytes of processor storage.
Model K2	2,097,152 bytes of processor storage.

For additional models of the 3135, see 3135-3 in "Machines" pages.

Highlights: Depending upon the processing unit model, up to 2,097,152 bytes of processor storage are available. CPU cycle of 202.5 - 315 nanoseconds depending upon internal operation being performed. Sixteen general purpose and four floating point registers.

Virtual storage capability to increase the effective utilization of main storage.

On the 3145 mdls FED*, GE, GFD, H, HG or I, the 2319 Disk Storage mdl A1 (with 2312, 2313, 2318 or 2319 mdl A2 Disk Storages) can be natively attached via the Integrated File Adapter (#4650). 3333 Disk Storage and Control modules (with 3330 modules) and/or 3340 Disk Storage mdl A2s (with 3340 B mdls and/or 3344s) and/or 3350 Disk Storage mdls A2/A2F (with 3350 B2/B2F, C2/C2F mdls) can be attached to 3145 mdls FED, GE, GFD, H, HG or I via the Integrated Storage Control on 3345 mdls 3, 4 or 5. Attachment of 3330 series, 3340 series and 3344s and/or 3350 series disk storage to 3145 mdls H2, HG2, I2, IH2, J2, JI2 or K2 is via the Integrated Storage Control (#4660).

In addition to main storage, 32,768 bytes of Reloadable Control Storage are included in the CPU for all storage configurations. This feature permits emulator and control routines to function. Any expansion of control storage beyond 32,768 bytes (up to 65,536 bytes maximum) is provided in 2,048 byte increments at the expense of main memory ... see "Control Storage Requirements" below for basic machine and selected feature requirements in microcode.

An optional Clock Comparator and CPU Timer provides additional timing facilities for the programmer.

Virtual Storage: Extended Control (EC) Mode expands the structure of the Program Status Word to accommodate the control of new S/370 features and extends the number of permanently assigned main storage locations. The S/370 mdl 145 can operate in either EC Mode or Basic Control (BC) Mode as defined for S/360. Dynamic Address Translation (DAT) is a standard feature on the S/370 mdl 145. When the S/370 mdl 145 is in EC Mode, with Translation Mode operable, program addresses are treated as "logical addresses" and the translation feature develops "real addresses." Since logical storage addressing is not limited by the amount of available real storage, program size may exceed real storage size. This logical storage is referred to as "virtual storage" and may be as large as 16,777,216 bytes on the S/370 mdl 145. For I/O operations, Channel Indirect Addressing provides a means to transmit data that spans pages of noncontiguous real storage.

Program Event Recording, a standard feature, is a debugging aid which permits four types of events to be selectively monitored in a virtual environment: [1] Successful branches ... [2] Instruction fetch address compare ... [3] Main Storage alteration address compare ... [4] General Purpose Register alteration address compare.

Standard features include a commercial instruction set, new S/370 instructions, Extended Control (EC) Mode, Dynamic Address Translation, Channel Indirect Data Addressing, Program Event Recording, interval timer, time-of-day clock, store and fetch protect, console file, byte-oriented operand feature, error checking and correction code on main storage, micro-instruction retry, channel retry information, byte multiplexer channel, audible alarm, OS/DOS Compatibility Feature, and one selector channel.

PREREQUISITES:

For 3145 mdl HG or I -- 3345 Storage and Control Frame and 3046 Power Unit.

For 3145 mdl H2, HG2, I2, IH2, J2, JI2 or K2 -- 3047 Power Unit.

Control Storage Requirements: The Reloadable Control Storage is housed in the CPU and is loaded from the Console File, which is located below the console reading board. This area of control storage is not available to the user. Control Storage requirements for the system are as follows:

Basic System Microcode -- does not include 16 standard subchannels on the byte multiplexer channel 26,000 bytes

Byte Multiplexer Channel UCWs -- select one of the following:

1. 16 MPX Channel Units	256	
2. 32 MPX Channel Units	512	
3. 64 MPX Channel Units	1024	
4. 128 MPX Channel Units	2048	
5. 256 MPX Channel Units	4096	+ ___bytes

Optional System Features

1. Console Printer/Keyboard and Alternate Console Facility (select one of the following):

3210 Console Printer-Keyboard mdl 1	3200	
3210 Console Printer-Keyboard mdl 1 with remote 3210 mdl 2	3440	
3215 Console Printer-Keyboard	3800	
3215 Console Printer-Keyboard with remote 3210 mdl 2	4570	+ ___bytes

2. Selector Channel Block Multiplex Feature (basic microcode which supports any and all selector channels with block multiplex) 2500 + ___bytes

3. UCWs for the Block Multiplexer Channel come in multiples of 16 which are shared among all Block Multiplexer Channels

8 bytes x UCWs = + ___bytes
NOTE: 512 UCWs are maximum.

4. Integrated File Adapter 9760 + ___bytes

5. Compatibility Support -- select one:

1401/1440/1460 Compatibility	5200	+ ___bytes
1401/1440/1460, 1410/7010 Compatibility	6000	+ ___bytes

6. Floating Point 2240 + ___bytes

7. Direct Control Feature 80 + ___bytes

8. Clock Comparator and CPU Timer 1800 + ___bytes

9. Conditional Swapping 140 + ___bytes

10. Advanced Control Program Support 860 + ___bytes

11. Virtual Machine Assist 2400 + ___bytes

12. APL Assist 19500 + ___bytes

Control storage requirements in excess of 32,768 bytes will reduce processor storage by the amount exceeding 32,768 bytes in 2,048-byte increments to a maximum of 65,536 bytes.

Example: Basic System	26,000 bytes
16 UCWs on byte multiplexer channel	256 bytes
3210 Console Printer-Keyboard mdl 1	3,200 bytes
Integrated File Adapter	9,760 bytes
1401/1440/1460 Compatibility	5,200 bytes
	44,416 bytes

The Movable Control Storage Boundary is set on 2,048 bytes. Control Storage required is 45,056 (32,768 + 6 x 2,048). The impact on processor storage is 12,288 bytes.

The address boundary between control and processor storage is assigned at Initial Micro Program (IMPL) time. The boundary is established by the value loaded (during IMPL) according to the requirements in the console file. The boundary established is the upper limit of main storage addresses. If an I/O operation or program instruction attempts to address a main storage location at or above this boundary, an address check occurs and no storage location is accessed. If a control storage access is attempted below the boundary, a machine check occurs. Control storage will never be less than 32,768 bytes. Above this amount - to a maximum of 65,536 bytes - control storage is allocated from processor storage in 2,048-byte increments depending upon requirements specified to the system. This allocation can be changed by utilizing an alternate magnetic disk cartridge with another set of 3145 features. Alternate cartridges for an installation will be available via RPQ.

For S/360 Programming Systems (DOS and OS), the amount of processor storage available after control storage requirements have been met must be equal to or larger than the S/360 memory

* 3145 mdl FED is no longer available.

3145 Processing Unit (cont'd)

size that the version of the operating system requires. Any decrementing of processor storage for control storage requirements will be made in increments of 2,048 bytes.

Input/Output Attachment — a wide variety of I/O devices may be attached to the S/370 mdl 145 via the standard byte multiplexer channel and the optional selector channels. There are, however, four direct attachment features for the 3145. They are:

Console File (standard) — this is the basic microprogram loading device for the system. The console file contains a small, low-performance read-only file device that provides all of the microcode for the system on removable magnetic disk cartridges. The several disks that will be supplied with the system will supply all of the required microcode for FE diagnostics, basic systems features, plus the optional features ordered for the system.

Console Printer-Keybaord (required) — this unit serves as the on-line input/output device for operator/system communications. It provides a means of manually entering data into the system, altering data already in storage, and for printing error logout messages.

Integrated File Adapter (optional on 3145 mdls FED, GE, GFD, H, HG or I ... not available on mdls H2, HG2, I2, IH2, J2, JI2 or K2) — this feature enables native attachment of 2319 Disk Storage mdl A1 (and additional 2312*, 2313*, 2318* or 2319 mdl A2* Disk Storages) through an integrated adapter. The adapter is permanently assigned to the standard selector channel (Channel 1), and requires space normally assigned to Selector Channel 4. When the IFA is installed, Selector Channel 2 becomes standard, and only Selector Channel 3 can be ordered.

Integrated Storage Control (optional on mdls H2, HG2, I2, IH2, J2, JI2 or K2 ... not available on mdls FED, GE, GFD, H, HG or I) — this feature allows native attachment of 3333 Disk Storage and Control modules (with 3330 modules) and/or 3340 Disk Storage mdl A2s (with 3340 B mdls and/or 3344s) and/or 3350 Disk Storage mdls A2/A2F (with 3350 B2/B2F, C2/C2F mdls). This feature requires an available control unit position on a system channel. A Block Multiplexer Channel and one unshared sub-channel per logical device are required for support of block multiplexing and rotational position sensing. If this support is not required, attachment to a system selector channel is permitted.

This attachment capability is provided for the 3145 mdls FED, GE, GFD, H, HG or I via the 3345 mdls 3, 4 and 5 ... see 3345.

Input/Output Channels

Byte Multiplexer Channel — one is standard on the 3145 and is functionally equivalent to the byte multiplexer channel on the S/360 mdls 30, 40 and 50. Sixteen subchannels are provided as standard with the option of 32, 64, 128 or 256 ... see "Special Features." At system order time, the number of units on the multiplexer channel must be specified in order that the correct amount of control storage is reserved. The byte multiplexer channel provides eight control unit positions and permits several I/O operations simultaneous with computing. In burst mode, the channel handles one high speed unit. For Operating System/360 exclusion, refer to SRL GC28-6554, *System/360 Operating Systems System Generation*.

Selector Channels — one is standard and three additional are available ... see "Special Features." **NOTE:** If the Integrated File Adapter is specified, see Selector Channel under "Special Features" for limitations. With the optional Word Buffer installed, the selector channel data rate will approximate 1.85 megabytes/second, while unbuffered, the data rate will be 820KB. The Block Multiplexer Channel is also available for the selector channels and the channel data rates apply with or without the feature. On channels without the Word Buffer (#8810), the 3330/3830 or 3345 mdl 3, 4, 5 with 3330 drives must be attached to channel 1 of non-IFA systems and to channel 2 of IFA systems. On channels with #8810, the 2305/2835 mdl 2 must be attached to channel 1 on non-IFA systems and to channel 2 on IFA systems, and the 3330/3830 or 3345 mdl 3, 4, 5 may be attached to any available channel. **NOTE:** If block multiplexing or rotational position sensing is required, the Block Multiplexer Channel feature must be installed. The Word Buffer (#8810) is required to attach the 2305/2835 mdl 2 or 3340. If the S/370 mdl 145 has 3 or 4 selector channels (IFA counts as a selector channel), the Word Buffer (#8810) is required to attach a 3330 series facility.

Console Function — a standard system control panel is located on the 3145. It has switches and lights necessary to operate and control the system. A systems control I/O function is provided with either of two alternatives. Feature #7844 attaches the 3210 Console Printer-Keybaord mdl 1 (15.5 cps) on the console table reading board. Optionally, the 3215 Console Printer-Keybaord (85 cps) can be attached via feature #7855. Either #7844 or #7855 is required in the system. A remote 3210 mdl 2 may also be attached ... see "Special Features."

Bibliography: GC20-0001

- SPECIFY:** [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
- [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- [3] Console Table (Reading Board) Extension: #9824 for extension to operator's right, or #9825 for extension to left.
- [4] Cabling: #9080 for below the floor, or #9081 for on the floor.
- [5] Additional Multiplexer Subchannels: 16 are standard ... if more are required, see "Special Features."
- [6] Emergency Power-Off Control: May be required ... see "Special Features" and S/370 Manual, *Installation Information Physical Planning*, for requirements.
- [7] Minimum Configuration: See "Minimum Configurations" in "Systems" for minimum I/O units required on a S/370 mdl 145.
- [8] RETAIN/370: #9570 for non-use of FE DAU, #9571 for first CPU using FE DAU, #9572 for second CPU using FE DAU, or #9573 for third CPU using FE DAU. Customer must provide interface for FE DAU to the telephone line.
- [9] Shipping Instructions: Unless otherwise specified, shipping dimensions of the 3145 Frame 01 (CPU) are 31-1/2" wide x 70" long x 60" high. Removal of the side covers will reduce the width to 29-1/2". If further reduction in length is required, specify #9692. Shipping dimensions will then be 29-1/2" wide x 60" long x 60" high.
- [10] Console Printer-Keybaord Address: Recorded on the console file disk at the plant. #9101\$ for "01F," or #9102\$ for "009".
- [11] Alternate Console Printer-Keybaord Address: #9105\$... alternate address of "009" for the Second Console Printer-Keybaord (3210 mdl 2). Address is in lieu of the standard Alternate Console Printer-Keybaord address of "01E" when the Primary Console Printer-Keybaord address is "01F". Recorded on the console file disk at the plant. **PREREQUISITE:** #9101. Primary Console Printer-Keybaord Address "01F".
- [12] When attaching a 3345 mdl 3, 4 or 5, specify #9851.

PRICES:	MDL	MAC/ MRC	TLP/ MLC 4 Year	Purchase	MMMC
3145	GE	\$13,890	\$12,630	\$534,700	\$1,150
	GFD	14,930	13,575	566,800	1,185
	H	15,970	14,520	598,900	1,215
	HG	15,990	14,540	600,050	1,215
	I	16,010	14,560	601,200	1,215
	H2	15,660	14,240	585,200	1,175
	HG2	17,570	15,985	644,050	1,280
	I2	18,960	17,255	688,700	1,395
	IH2	21,750	19,795	778,000	1,610
	J2	24,540	22,335	867,300	1,825
	JI2	30,630	27,880	1,062,100	2,245
	K2	36,210	32,960	1,240,700	2,665

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Base Unit Maintenance: A
 Per Call: 3 Purchase Option: 45%** Warranty: A
 Useful Life Category: 2 Termination Charge Months: 6
 Termination Charge Percent: 25% Upper Limit Percent: 5%
 Model/Feature Additional Charge in lieu of AU Charge: 15%

Model Changes: Field installable. When ordering field conversion of a 3145 mdl FED, GE, GFD, H, HG or I to a mdl H2, HG2, I2, IH2, J2, JI2 or K2, see "Specify" under 3047 for additional requirements.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	GFD	H	HG*	I*
GE	\$32,100	\$64,200	\$65,350	\$66,500
GFD		32,100	33,250	34,400
H			1,150	2,300
HG				1,150

* Applicable only when the 3145 mdl HG or I is used with the appropriate 3345 Storage and Control Frame as described under "Models" above. Prices do not include those of the required 3345.

§ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

** Purchase Option is 50% under Term Lease Plan (TLP)

* No longer available.

† NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.



3145 Processing Unit (cont'd)

From To	H2	HG2	I2	IH2	J2	J12	K2
GE	\$79,280	\$138,150	\$182,800	\$272,100	\$361,400	RPQ	RPQ
GFD	47,180	106,050	150,700	240,000	329,300	RPQ	RPQ
H	15,080	73,950	118,600	207,900	297,200	RPQ	RPQ
HG	RPQ	RPQ	120,050	209,350	298,650	RPQ	RPQ
I			RPQ	209,350	298,650	RPQ	RPQ
H2		58,850	103,500	192,800	282,100	476,900	655,500
HG2			44,650	133,950	223,250	418,050	596,650
I2				89,300	178,600	373,400	552,000
IH2					89,300	284,100	462,700
J2						194,800	373,400
J12							178,600

Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of model changes to the '2' series from the non '2' series involves the removal of parts which become the property of IBM."

SPECIAL FEATURES

ADVANCED CONTROL PROGRAM SUPPORT (#1001). Provides four additional instructions and a new function ... Compare and Swap ... Compare Double and Swap ... Insert PSW Key ... Set PSW Key from ADDRESS ... Clear I/O Function. This feature is a prerequisite for the execution of MVS (OS/VS2 Release 2 and above) and/or VTAM and for TCAM/NCP. **Limitation:** Cannot be installed if Conditional Swapping (#1051) is installed. **Field Installation:** Yes.

APL ASSIST (#1005). Provides performance assist to APL programs when used with the VS APL PP #5748 AP1. **Field Installation:** Yes.

CONDITIONAL SWAPPING (#1051). Provides two additional instructions ... Compare and Swap ... Compare Double and Swap. This feature is a prerequisite for the execution of VTAM programming support and for TCAM/NCP. **Limitation:** Cannot be installed if Advanced Control Program Support (#1001) is installed. **Field Installation:** Yes.

BLOCK MULTIPLEXER CHANNEL (#1421). Increases the efficiency of the selector channel when using direct access storage devices equipped with rotational position sensing. The disconnected command chaining feature of the channel allows multiple devices to perform non-data transfer operation concurrently with one data transfer operation. This permits increased utilization of the channel by performing operations on other devices while the channel would have normally been waiting on one device. This feature provides Block Multiplexer capabilities for all system Selector Channels. **Field Installation:** Yes. **Specify:** The number of UCWs (available in multiples of 16) for Block Multiplexer Channels must be specified. Select one of the following numbers, which will supply the specified number of UCWs to be shared by the Block Multiplexer Channel(s) ... field installable.

Code	UCWs	Code	UCWs	Code	UCWs	Code	UCWs
#9491	16	#9499	144	#9507	272	#9515	400
9492	32	9500	160	9508	288	9516	416
9493	48	9501	176	9509	304	9517	432
9494	64	9502	192	9510	320	9518	448
9495	80	9503	208	9511	336	9519	464
9496	96	9504	224	9512	352	9520	480
9497	112	9505	240	9513	368	9521	496
9498	128	9506	256	9514	384	9522	512

Note: The number of UCWs specified for the Block Multiplexer Channel(s) does NOT affect the number of Multiplexer Subchannels. See Multiplexer Subchannels, Add'l (#4951 - 4954).

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (either S/360, S/370 or 4341 Processor). Only one of the processors requires this feature. Uses two control unit positions on each of the connected channels. **Maximum:** One. **Field Installation:** Yes.

CLOCK COMPARATOR AND CPU TIMER (#2001). The Clock Comparator provides a means of causing an interruption when the time-of-day clock has passed a program-specified value. The CPU Timer is a decrementing binary counter with a resolution of one microsecond. It provides a means for measuring elapsed CPU time by causing an interruption when a pre-specified amount of time has elapsed. **Maximum:** One. **Field Installation:** Yes.

CONTROL STORE EXTENSION (#2150). [Mdl's H2, HG2, I2, IH2, J2, J12, K2 only] Provides additional control store for microprogram use on the ISC (#4660) ... see "Specify" under Integrated Storage Control (#4660) to determine when required. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Expanded Control Store (#2152).

EXPANDED CONTROL STORE (#2152). [Mdl's H2, HG2, I2, IH2,

‡ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. ‡405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

J2, J12, K2 only] Provides additional control storage for microprogram use on the ISC (#4660) ... see "Specify" under Integrated Storage Control (#4660) to determine when required. **Limitation:** Cannot be installed with Control Store Extension (#2150). **Maximum:** One. **Field Installation:** Yes.

DIRECT CONTROL (#3274). Provides two instructions, Read Direct and Write Direct and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in S/360 - Direct Control Feature - OEM, SRL GA22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide, in effect, a single emergency power-off switch in a "room" or "area" ... see Emergency Power-Off Control under S/370 mdl 145 in "Systems." #3621 - to interconnect two emergency power-off switches ... #3622 - to interconnect up to twelve emergency power-off switches.

FLOATING POINT (#3910). Adds floating point instructions to the S/370 mdl 145 standard instruction set. Provides for floating point operations including extended precision to 28 hexadecimal digits. **Field Installation:** Yes.

1401/1440/1460 COMPATIBILITY (#4457). Microprogram controlled feature which, in combination with special software, permits the system to execute 1401/1440/1460 instructions. **Field Installation:** Yes.

1401/1440/1460, 1410/7010 COMPATIBILITY (#4458). Gives 1401/1440/1460 compatibility, plus 1410/7010 compatibility. **Field Installation:** Yes.

INTEGRATED FILE ADAPTER (#4650). [Mdl's FED, GE, GFD, H, HG, I only] Permits native attachment of the 2319 Disk Storage mdl A1 (and additional 2312, 2313, 2318 or 2319 mdl A2 Disk Storages ... up to eight drives total) through an integrated adapter. Standard features include file scan and record overflow functions. **Specify:** One of the following additional power features - #9303 for three drives ... #9304 for four ... #9305 for five ... #9306 for six ... #9307 for seven ... #9308 for eight. See 2319 for additional ordering instructions. **Limitation:** Cannot be installed on mdl's H2, HG2, I2, IH2, J2, J12 or K2. **Field Installation:** Not recommended ... but may be removed in the field.

INTEGRATED STORAGE CONTROL (#4660). [Mdl's H2, HG2, I2, IH2, J2, J12, K2 only] Provides for the attachment of 3333s (mdl's 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdl A2s/A2Fs ... see DASD Configuration under Specify, below. Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl Bs and/or 3344s to the 3340 mdl A2 or by attaching 3350 mdl Bs and/or a mdl C to the 3350 mdl A2 or A2F ... see DASD Configuration table below and 3330, 3333, 3340, 3344, 3350 "Machines" pages. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed on mdl's FED, GE, GFD, H, HG or I. **Prerequisites:** Requires a control unit position on a system channel. A block multiplexer channel and one unshared sub-channel per logical device are required for support of block multiplexing and rotational position sensing. If this support is not required, attachment to a system selector channel is permitted. Word Buffer (#8810) is required to support the 3340, or if the system includes Selector Channel, 3rd (#6983). **Specify:** The available combinations of storage devices which can be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required DASD Specify Features" are installed. Based on the DASD, and the Special Features listed below being ordered for them, order the Required DASD Specify Feature(s). [Note that #9190 is 3340 Fixed Head Attachment for #9314 and #9315 and is not specified for #9317 or #9318.]

3145 Processing Unit (cont'd)
ISC (#4660) WITH ONE CHANNEL OR WITH TWO CHANNEL SWITCH (#8100)

DASD Configuration	Required DASD Specify Features *								
	9313†	9314†	9314† 9190†	9315†	9315† 9190†	9317†	9318†		
3333 Only	One or two 3333s with associated 3330s	x	x						
	Up to four 3333s with associated 3330s			xx					
	String Switch (8150) on any 3333	x			x				
3340 Only	One or two 3340 mdl A2s with associated mdl B1/B2s		x	x			x		
	Up to four 3340 mdl A2s with associated mdl B1/B2s				xx		xx		
	String Switch (8150) on any 3340 mdl A2		x		x	x	x		
	Fixed Head Feature (4301/4302) on any 3340			x		x	x		
3340/3344	Up to four 3340 mdl A2s of which up to two may attach 3344s						x	x	
	String Switch (8150) on any 3340 mdl A2 and/or Fixed Head Feature on any 3340 (4301/4302)							x	
3333/3340 (not 3344)	3333s and 3340 mdl A2s (any combination of two, three, or four) each with associated drives				xx		xx		
	String Switch (8150) on any 3333 or 3340 mdl A2					x		x	
	Fixed Head Feature (4301/4302) on any 3340						xx		
3350 Only	Up to four 3350 mdl A2s/A2Fs w associated mdl B2s/B2Fs, C2/C2F							x	x
	String Sw (8150) on any 3350 mdl A2/A2F,C2/C2F								x
3333/3340/3350 (not 3344)	3333s, 3340 mdl A2s and 3350 mdl A2s/A2Fs (any combination of 2, 3 or 4) with associated drives								xx
	String Sw (8150) on any 3333, 3340 mdl A2, or 3350 mdl A2/A2F,C2/C2F and/or Fixed Head Fea (4301/4302) on any 3340								x

† ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

* Any change to an installed DASD Configuration requires an MES ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.

** Control Store Extension (#2150) is prerequisite. With #9315, the ISC requires 32 contiguous device addresses regardless of the number of drives attached.

+ Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 mdl A2s on the first and third strings may attach up to three 3340 mdl B1, B2s, and/or 3344s in any combination. The 3340 mdl A2 on the second string may attach up to three 3340 mdl B1/B2s. The 3340 mdl A2 on the fourth string may attach one 3340 mdl B1 or B2.

++ Expanded Control Store (#2152) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 8 or 16 or 32 or 64 device addresses depending upon the DASD configuration installed and whether any 3350 drive is in 3330-1 compatibility mode.

NOTE: Customers who may elect to purchase Control Store Extension (#2150) and later upgrade to Expanded Control Store (#2152) should consider the purchase of Expanded Control Store (#2152) initially because this field upgrade requires replacement of Control Store Extension (#2150) and installation of Expanded Control Store (#2152). The prerequisite of Control Store Extension (#2150) for #9315 or #9317 can be satisfied by Expanded Control Store (#2152).

MULTIPLEXER SUBCHANNELS, ADD'L (#4951-4954). To increase the number of I/O devices on the multiplexer channel, the number of subchannels can be increased by specifying one of the following: #4951 - for 32 multiplexer subchannels ... #4952 - for 64 ... #4953 - for 128 ... or #4954 - for 256. The maximum number of shared subchannels is eight. When 256 multiplexer

subchannels are installed there are NO shared subchannels. **Note:** The number of Multiplexer Subchannels does not affect the number of UCWs specified for the Block Multiplexer Channel(s). See Block Multiplexer Channel (#1421) specify. **Field Installation:** Yes.

REGISTER EXPANSION (#6111), Provides additional registers for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (#4660) to determine when required. **Field Installation:** Yes **Maximum:** One.

SELECTOR CHANNEL (#6982-6984). Each adds a high-speed channel to the system. The channel permits overlapped I/O operation with processing. Eight control unit positions are provided on each channel. #6982 - for second selector channel ... #6983 - for third ... #6984 - for fourth. **Limitation:** If Integrated File Adapter (#4650) is installed, Selector Channels 1 and 4 are preempted, Channel 2 becomes standard and only Channel 3 (#6983) can be ordered. **Field Installation:** Yes. **Prerequisites:** #6983 requires #6982 or #4650 ... #6984 requires #6983 ... if 3330 or 3333 drives are to be attached to the system, #6983 requires Word Buffer (#8810).

3210 MDL 1 ADAPTER (#7844). To attach a 3210 Console Printer-Keyboard mdl 1 (15.5 cps) for system console I/O ... includes an alter-display ability. Position of the 3210 to the right or left of the operator depends on Console Table Extension (#9824 or #9825) ... see "Specify" above. **Limitation:** Cannot be installed with 3215 Adapter (#7855). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Uses one address on the standard byte multiplexer channel, but does not use a control unit position.

3210 MDL 2 ADAPTER (#7845). To attach a free-standing 3210 Console Printer-Keyboard mdl 2 for remote systems console I/O. **Limitation:** Maximum distance from the console is 75 feet. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** Either a #7844 or #7855 and a #4951, 4952, 4953 or 4954. Uses one address on the standard byte multiplexer channel, but does not use a control unit position. The standard address for the Alternate Console Printer-Keyboard is "01E" if the Primary Console Printer-Keyboard address is "01F". If the Primary Console Printer-Keyboard address is "009", the standard address for the Alternate Console Printer-Keyboard is "008". Also see "Specify" for alternate address.

3215 ADAPTER (#7855). To attach a 3215 Console Printer-Keyboard (85 cps) for systems console I/O ... includes alter-display ability. Position of the 3215 to the right or left of the operator depends upon Console Table Extension (#9824 or #9825) ... see "Specify" above. **Limitation:** Cannot be installed with 3210 Mdl 1 Adapter (#7844). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Uses one address on the standard byte multiplexer channel, but does not use a control unit position.

TWO CHANNEL SWITCH (#8100). [Mdl's H2, HG2, I2, IH2, J2, JI2, K2 only] To attach the Integrated Storage Control (#4660) to a second channel ... the two channels may be on the same or different CPUs. Switching is under program control. The ISC feature in the 3145 can be dedicated to a single channel by means of an Enable/Disable switch. **Limitation:** Cannot be installed on a mdl FED, GE, GFD, H, HG or I. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** See "Prerequisites" under ISC (#4660).

VIRTUAL MACHINE ASSIST (#8740). Provides assist to VS operating systems operating under VM/370 by emulation of certain privileged operations. **Field Installation:** Yes. **Prerequisites:** Clock Comparator and CPU Timer (#2001) and Floating Point (#3910).

WORD BUFFER (#8810). Increases the data rate capability of the selector channels on the 3145 from a maximum aggregate data rate of 1.55 megabytes per second to 5.3 megabytes, and the maximum single channel rate from 0.82 megabytes to 1.85 megabytes. When installed, applies to all selector channels. **Field Installation:** Yes. **Prerequisite:** This feature is required to operate 3330 series drives when the system configuration includes an Integrated File Adapter and two Selector Channels, or three or more Selector Channels. It is also required whenever 3340, 3344 or 3350 series drives are attached.



3145 Processing Unit (cont'd)

Special Feature Prices:		TLP		Purch	MMMC
		MAC/ MRC	MLC 4 Yr		
Advance Cntrl Prgm Supp	#1001	NC	NC	***	NC
APL Assist	1005	NC	NC	***	NC
Conditional Swapping	1051	NC	NC	***	NC
Block Multiplexer Channel for all Selector Channels	1421	NC	NC	***	NC
Channel-to-channel Adapter	1850	\$ 328	\$ 297	\$12,510	\$13.00
Clk Comprtr & CPU Timer	2001*	114	104	5,485	3.00
Control Store Extension	2150**	262†	238†	8,350	10.00
Expanded Control Store	2152**	421†	383†	13,420	20.50
Direct Control	3274*	146	133	5,640	4.00
Emergency Power-Off Control for 2 switches	3621	NC	NC	NC	NC
for up to 12 switches	3622	NC	NC	NC	NC
Floating Point	3910	NC	NC	***	NC
1401/1440/1460 Compat	4457	NC	NC	***	NC
1401/1440/1460, 1410/7710 Compatibility	4458	NC	NC	***	NC
Integrated File Adapter	4650*	607	552	25,860	45.00
Integrated Storage Control	4660**	1,007†	915†	40,460	91.00
Multiplexer Subchannels, Add'l					
32 subchannels	4951	NC	NC	***	NC
64 subchannels	4952	NC	NC	***	NC
128 subchannels	4953	NC	NC	***	NC
256 subchannels	4954	NC	NC	***	NC
Register Expansion	6111**	24†	22†	662	4.00
Selector Channel - 2nd	6982*	277	252	13,240	16.00
Selector Channel - 3rd	6983*	277	252	13,240	16.00
Selector Channel - 4th	6984*	277	252	13,240	16.00
3210 Model 1 Adapter	7844*	153	140	7,410	4.00
3210 Model 2 Adapter	7845*	123	112	5,925	6.50
3215 Adapter	7855*	215	196	10,380	6.50
Two Channel Switch	8100	205†	186†	7,075	10.00
Virtual Machine assist	8740	NC	NC	***	NC
Word Buffer	8810*	247	225	11,780	6.50

† MAC/MRC, TLP/MLC prices effective June 1, 1979.

* Feature supplies CPU diskette.

** Feature supplies ISC diskette.

*** CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. \$405 on purchased machines when combined with changes subject to a distribution fee to include any number of diskette-only changes ordered on the same diskette.

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IBM 3145-3 PROCESSING UNIT

Purpose: Provides a performance improvement for today's S/370 mdl 145 models H2, HG2, I2, IH2, J2, JI2 and K2 only.

Model	Processor Storage
A1*	196,608 Bytes of Processor Storage
A2*	327,680 Bytes of Processor Storage
A3*	458,752 Bytes of Processor Storage
A4*	720,896 Bytes of Processor Storage
A5*	983,040 Bytes of Processor Storage
A6*	1,507,328 Bytes of Processor Storage
A7*	2,031,616 Bytes of Processor Storage

NOTE 1: The 3145-3 is available as a non-removable, field installable upgrade to a S/370 mdl 145 models H2, HG2, I2, IH2, J2, JI2 and K2.

NOTE 2: Up to 64K of main memory is removed during the conversion to a 3145-3 resulting in the memory sizes as specified.

* A complete systems assurance review/approval at the branch office level is required before ordering.

Highlights: Depending on the model, up to 2,031,616 bytes of processor storage are available. CPU cycle time varies from 180 to 270 nanoseconds depending upon the internal operation being performed. Sixteen general purpose and four floating point registers are provided.

Standard Features Include: Advanced Control Program Support ... APL Assist ... Audible Alarm ... Byte Oriented Operand ... 1 Byte Multiplexer Channel ... 64 Byte Multiplexer Subchannels ... 1 Block Multiplexer Channel ... 64 Block Multiplexer Subchannels ... Channel Command Retry ... Channel Indirect Addressing ... Console File ... Control Registers ... Dynamic Address Translation ... Error Checking and Correction (in Main and Control Storage) ... Extended Control Mode ... Extended Control-Program Support ... Extended Precision ... Interval Timer ... Machine Check Handling ... Microprogram Instruction Retry ... OS/DOS Compatibility ... Program Event Recording ... Storage Protection (Store and Fetch) ... S/370 Universal Instruction Set ... Time of Day Clock.

Control Storage: 131,072 bytes of Reloadable Control Storage are provided in addition to main storage. This permits emulator and control routines to function. The Reloadable Control Storage is housed in the CPU and is loaded from the Console File which is located beneath the operator's console. Reloadable Control Storage is not accessible to the user.

Virtual Storage: Virtual Storage capability is provided to increase the effective utilization of main storage.

Console File (standard): This is the basic microprogram loading device for the system. The console file contains a small file device that provides all of the microcode for the system on removable magnetic disks. The several disks that will be supplied with the system will supply all of the required microcode for FE diagnostics, basic systems features, plus the optional features ordered for the system.

Console Function: Operator communications with the system is via a system control panel located on the 3145-3 and a 3210 mdl 1 or a 3215 Console Printer-Keyboard as on other models of the S/370 mdl 145. A remote 3210 mdl 2 may also be attached ... see "Special Features."

Input/Output Channels:

Byte Multiplexer Channel — one is standard ... functionally equivalent to the byte multiplexer channel of the S/370 mdls 145 ... provides eight control unit positions ... in byte mode, permits simultaneous operation of many low-speed devices ... in burst mode, handles one high-speed unit.

Block Multiplexer Channels — one is standard ... 3 are available as special features ... the Word Buffer feature applies to any block multiplexer channels which are attached to the system ... as described, each Block Multiplexer Channel approximates 1.85 megabytes/second ... ability to "Block Multiplex" provides greater channel efficiency when using direct access storage devices equipped with rotational position sensing ... devices on these channels which cannot use block multiplexing will function as if attached to selector channels.

Subchannels — on the byte multiplexer channel 64 subchannels are provided as standard with the option of 128 or 256 (see "Special Features") ... 64 block multiplexer subchannels (UCWs) are provided as standard with the option of 128, 256, or 512 (see "Special Features") ... the number of block multiplexer subchannels (UCWs) chosen will be shared by the number of Block Multiplexer Channel(s) attached to the system.

Input/Output Attachment:

Non-native — a wide variety of I/O devices may be attached to

these models of the S/370 mdl 145 via the standard byte multiplexer channel, the standard block multiplexer channel, and/or the optional block multiplexer channels. In particular, any I/O device which is attachable to a 3145 is attachable to a 3145-3.

Native — The following integrated I/O attachments/adapters are provided for controlling the designated I/O devices:

Console Printer-Keyboard (required) — the unit serves as the online input/output device for operator/system communications. It provides a means of manually entering data into the system, altering data already in storage, and for printing error logout messages.

Integrated Storage Control — this feature allows native attachment of 3333 Disk Storage and Control modules (with 3330 modules) and/or 3340 Disk Storage mdl A2s (with 3340 B mdls and/or 3344s) and/or 3350 Disk Storage mdls A2/A2F (with 3350 B2/B2F, C2/C2F mdls). This feature requires an available control unit position on a system channel.

Programming Features:

Advanced Control Program Support (standard) — provides four additional instructions and an additional function ... Compare and Swap ... Compare Double and Swap ... Insert PSW Key ... Set PSW Key from Address ... Clear I/O Function.

APL Assist (standard) — this feature is an APL emulator. It replaces functions performed by the APL software interpreter. This feature can provide a performance improvement for many APL applications when used with VS APL PP #5748 AP1.

Extended Control Program Support (standard) — the 3145-3 processor models of the S/370 mdl 145 include Extended Control-Program Support. This is a hardware assist that reduces the CPU time needed to execute certain frequently used supervisor functions in both VS-1 and VM/370.

The functional areas for VM/370 include:

- Virtual Machine I/O
- Storage Management
- Page Management
- SVC Handler
- Privileged Instruction Interfaces
- Dispatching
- Virtual Interval Timer

For VS-1 the functional areas are:

- Storage Management
- IOS
- SVC FLIH
- System Trace
- Page Management

PREREQUISITES: The following prerequisites apply to each 3145-3 processor model.

- (1) 3047 Power Unit ... see 3047.
- (2) Clock Comparator and CPU Timer Feature (#2001) ... see 3145 Processing Unit (Special Features).
- (3) Word Buffer Feature (#8810) ... see 3145 Processing Unit (Special Features).

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Console Table (Reading Board) Extension: #9824 for extension to operator's right, or #9825 for extension to left.

[4] Cabling: #9080 for below the floor, or #9081 for on the floor.

[5] Additional Multiplexer Subchannels: 64 are standard ... if more are required, see "Special Features."

[6] Emergency Power-Off Control: May be required ... see "Special Features" and S/370 Manual, Installation Information Physical Planning, for requirements.

[7] Minimum Configuration: See "Minimum Configuration" in "Systems" for minimum I/O units required on a S/370 mdl 145.

[8] RETAIN/370: #9570 for non-use of FE DAU, #9571 for first CPU using FE DAU, #9572 for second CPU using FE DAU, or #9573 for third CPU using FE DAU. Customer must provide interface for FE DAU to the telephone line.

NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.

[9] Shipping Instructions: Unless otherwise specified, shipping dimensions of the 3145 Frame 01 (CPU) are 31-1/2" wide x 70" long x 60" high. Removal of the side covers will reduce the width to 29-1/2". If further reduction in length is required,



3145-3 Processing Unit (cont'd)

specify #9692. Shipping dimensions will then be 29-1/2" wide x 60" long x 60" high.

[10] Console Printer-Keyboard Address: Recorded on the console file disk at the plant. #9101\$ for "01F", or #9102\$ for "009".

[11] Alternate Console Printer-Keyboard Address: #9105\$... alternate address of "009" for the Second Console Printer-Keyboard (3210 mdl 2). Address is in lieu of the standard Alternate Console Printer-Keyboard address of "01E" when the Primary Printer-Keyboard address is "01F". Recorded on the console file disk at the plant. **PREREQUISITE:** #9101, Primary Console Printer-Keyboard Address "01F".

Prices:	Mdl	TLP		Purchase	MMMC
		MAC/MRC	MLC 4 Year		
3145	A1	\$21,260	\$19,335	\$ 775,200	\$1,380
	A2	23,170	21,080	834,050	1,485
	A3	24,560	22,350	878,700	1,600
	A4	27,350	24,890	968,000	1,810
	A5	30,140	27,430	1,057,300	2,030
	A6	36,230	32,975	1,252,100	2,445
	A7	41,810	38,055	1,430,700	2,870

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit Maintenance: A
Per Call: 3 Purchase Option: 45% + Warranty: A
Useful Life Category: 2 Termination Charge Months: 6
Termination Charge Percent: 25% Upper Limit Percent: 5%
Model/Feature Additional Charge in lieu of AU Charge: 15%

Model Changes: Field Installable.

Planning for Model Conversions: When a customer requires feature changes (except for one or both of the prerequisite features - Word Buffer #8810, and Clock Comparator and CPU Timer #2001) and/or memory upgrades in addition to a model upgrade to a 3145-3, consolidating the several changes into a single is not recommended.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges and parts removed remain the property of the customer)

From To	A1	A2	A3	A4	A5	A6	A7
H2 \$	\$190,000	\$248,850	\$293,500	\$382,800	\$472,100	\$666,900	\$845,500
HG2 \$		190,000	234,650	323,950	413,250	608,050	786,650
I2 \$			190,000	279,300	368,600	563,400	742,000
IH2 \$				190,000	279,300	474,100	652,700
J2 \$					190,000	384,800	563,400
J12 \$						190,000	368,600
K2 \$							190,000
A1		58,850	103,500	192,800	282,100	476,900	655,500
A2			44,650	133,950	223,250	418,050	596,650
A3				89,300	178,600	373,400	552,000
A4					89,300	284,100	462,700
A5						194,800	373,400
A6							178,600

\$\$ Prices shown do not include charges for any 3145-3 prerequisite features.

SPECIAL FEATURES

BLOCK MULTIPLEXER CHANNEL (#1427-1429). Each adds a high-speed channel to the system. The channel permits overlapped I/O operation with processing. Eight control unit positions are provided on each channel. #1427 - for second channel ... #1428 - for third ... #1429 - for fourth. **Field Installation:** Yes. **Prerequisites:** #1428 requires #1427 ... #1429 requires #1428.

BLOCK MULTIPLEXER SUBCHANNELS, ADDITIONAL (#1450). To increase the number of I/O devices on the block multiplexer channels, the number of subchannels (UCWs) can be increased by specifying one of the following: #9581\$ for 128 ... #9582\$ for 256 ... #9583\$ for 512. The number of subchannels selected will be shared by the Block Multiplexer Channel(s) attached to the system.

INTEGRATED STORAGE CONTROL (#4660). Provides for the attachment of 3333s (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdl A2s/A2Fs ... see DASH Configuration under Specify. Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl Bs and/or 3344s to the 3340 mdl A2 or by attaching 3350 mdl Bs and/or a mdl C to the 3350 mdl A2 or A2F ... see DASH Configuration table under Specify and 3330, 3333, 3340, 3344, 3350 "Machines" pages.

¢ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

††† Purchase Option is 50% under Term Lease Plan (TLP)

Maximum: One. Field Installation: Yes. Prerequisites: Requires a control unit position on a block multiplexer channel. Block multiplexing and rotational position sensing require one unshared subchannel on the block multiplexer channel per logical device. **Specify:** The available combinations of storage devices which can be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASH Configuration which can be attached when the "Required DASH Specify Features" are installed. Based on the DASH, and the special features listed below being ordered for them, order the Required DASH Specify Feature(s).

[Note that #9190 is 3340 Fixed Head Attachment for #9314 and #9315, and is not specified for #9317 or #9138.]

ISC (#4660) WITH ONE CHANNEL OR WITH TWO CHANNEL SWITCH (#8100).

DASH Configuration	Required DASH Specify Features*					
	9313†	9314†	9314† 9190†	9315**	9315† 9190†	9317† 9318†
3333 Only	One or two 3333s with associated 3330s	x	x			
	Up to four 3333s with associated 3330s			xx		
	String Switch (8150) on any 3333	x		x		
3340 - Only	One or two 3340 mdl A2s with associated mdl B1/B2s	x	x	x		x
	Up to four 3340 mdl A2s with associated mdl B1/B2s			x	x	x
	String Switch (8150) on any 3340 mdl A2		x		x	x
	Fixed Head Feature (4301/4302) on any 3340		x		x	x
3340/3344	Up to four 3340 mdl A2s of which up to two may attach 3344s					x
	String Switch (8150) on any 3340 mdl A2 and/or Fixed Head Feature on any 3340 (4301/4302)					x
3333/3340 (incl 3344)	3333s and 3340 mdl A2s (any combination of two, three, or four) each with associated drives			x	x	x
	String Switch (8150) on any 3333 or 3340 mdl A2			x		x
3350 Only	Fixed Head Feature (4301/4302) on any 3340				x	x
	Up to four 3350 mdl A2s/A2Fs w associated mdl B2s/B2Fs, C2/C2F					x
3333/3340/3350 (incl 3344)	String Sw (8150) on any 3350 mdl A2/A2F, C2/C2F					x
	3333s, 3340 mdl A2s and 3350 mdl A2s/A2Fs (any combination of 2, 3 or 4) with associated drives					x
3350 Only	String Sw (8150) on any 3333, 3340 mdl A2, or 3350 mdl A2/A2F, C2/C2F and/or Fixed Head Feature (4301/4302) on any 3340					x

† ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

* Any change to an installed DASH Configuration requires an MES ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.

** Control Store Extension (#2150) is prerequisite. With #9315, the ISC requires 32 contiguous device addresses regardless of the number of drives attached.

+ Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 mdl A2s on the first and third strings may attach up to three 3340 mdl B1, B2s, and/or 3344s in any combination. The 3340 mdl A2 on the second string may attach up to three 3340 mdl B1/B2s. The 3340 mdl A2 on the fourth string may attach one 3340 mdl B1 or B2.

++ Expanded Control Store (#2152) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 8 or 16 or 32 or 64 device addresses depending upon the DASH configuration installed and whether any 3350 drive is in 3330-1 compatibility mode.

**3145-3 Processing Unit (cont'd)**

NOTE: Customers who may elect to purchase Control Store Extension (#2150) and later upgrade to Expanded Control Store (#2152) should consider the purchase of Expanded Control Store (#2152) initially because this field upgrade requires replacement of Control Store Extension (#2150) and installation of Expanded Control Store (#2152). The prerequisite of Control Store Extension (#2150) for #9315 or #9317 can be satisfied by Expanded Control Store (#2152).

MULTIPLEXER SUBCHANNELS, ADDITIONAL (#4953, 4954). To increase the number of I/O devices on the byte multiplexer channel, the number of subchannels can be increased by specifying one of the following: #4953 for 128, or #4954 for 256. The maximum number of shared subchannels is eight. When 256 multiplexer subchannels are installed there are NO shared subchannels. **Note:** The number of Multiplexer Subchannels does not affect the number of UCWs specified for the Block Multiplexer Channel(s). See Block Multiplexer Subchannels, Additional (#1450) specify. **Field Installation:** Yes.

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (S/360, S/370, or 4341 Processor). Only one of the processors requires this feature. Uses two control unit positions on each of the connected channels. **Maximum:** One. **Field Installation:** Yes.

CLOCK COMPARATOR AND CPU TIMER (#2001). [Prerequisite for 3145-3] See M 3145 pages for description of feature.

CONTROL STORE EXTENSION (#2150). Provides additional control store for microprogram use on the ISC (#4660) ... see "Specify" under Integrated Storage Control (#4660) to determine when required. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Expanded Control Store (#2152).

EXPANDED CONTROL STORE (#2152). Provides additional control storage for microprogram use on the ISC (#4660) ... see "Specify" under Integrated Storage Control (#4660) to determine when required. **Limitation:** Cannot be installed with Control Store Extension (#2150). **Maximum:** One. **Field Installation:** Yes.

DIRECT CONTROL (#3274). Provides two instructions, Read Direct and Write Direct and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in S/360 - Direct Control Feature - OEM, SRL GA22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide, in effect, a single emergency power-off switch in a "room" or "area" ... see Emergency Power-Off Control under S/370 mdl 145 in "Systems." #3621 - to interconnect two emergency power-off switches ... #3622 - to interconnect up to twelve emergency power-off switches.

1401/1440/1460 COMPATIBILITY (#4457). Microprogram controlled feature which, in combination with special software, permits the system to execute 1401/1440/1460 instructions. **Field Installation:** Yes.

1401/1440/1460, 1410/7010 COMPATIBILITY (#4458). Gives 1401/1440/1460 compatibility, plus 1410/7010 compatibility. **Field Installation:** Yes.

REGISTER EXPANSION (#6111). Provides additional registers for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (#4660) to determine when required. **Field Installation:** Yes **Maximum:** One.

3210 MDL 1 ADAPTER (#7844). To attach a 3210 Console Printer-Keybaord mdl 1 (15.5 cps) for system console I/O ... includes an alter-display ability. Position of the 3210 to the right or left of the operator depends on Console Table Extension (#9824 or #9825) ... see "Specify" above. **Limitation:** Cannot be installed with 3215 Adapter (#7855). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Uses one address on the standard byte multiplexer channel, but does not use a control unit position.

3210 MDL 2 ADAPTER (#7845). To attach a free-standing 3210 Console Printer-Keybaord mdl 2 for remote systems console I/O. **Limitation:** Maximum distance from the console is 75 feet. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** Either a #7844 or #7855 and a #4953 or #4954. Uses one address on the standard byte multiplexer channel, but does not use a control unit position. The standard address for the Alternate Console Printer-Keybaord is "01E" if the Primary Console Printer-Keybaord address is "01F". If the Primary Console Printer-Keybaord address is "009", the standard address for the Alternate Console Printer-Keybaord is "008". Also see "Specify" for alternate address.

3215 ADAPTER (#7855). To attach a 3215 Console Printer-

Keyboard (85 cps) for systems console I/O ... includes alter-display ability. Position of the 3215 to the right or left of the operator depends upon Console Table Extension (#9824 or #9825) ... see "Specify" above. **Limitation:** Cannot be installed with 3210 Mdl 1 Adapter (#7844). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Uses one address on the standard byte multiplexer channel, but does not use a control unit position.

TWO CHANNEL SWITCH (#8100). To attach the Integrated Storage Control (#4660) to a second channel ... the two channels may be on the same or different CPUs. Switching is under program control. The ISC feature in the 3145 can be dedicated to a single channel by means of an Enable/Disable switch. **Limitation:** Cannot be installed on a mdl FED, GE, GFD, H, HG or I. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** See "Prerequisites" under ISC (#4660).

WORD BUFFER (#8810). [Prerequisite for 3145-3] See M 3145 pages for description of feature.

		MAC/ MRC	TLP/ MLC 4 Yr	Purch	MMMC
Blk Mltplx Chnl - 2nd	#1427*	\$ 277	\$ 252	\$13,240	\$16.00
Blk Mltplx Chnl - 3rd	1428*	277	252	13,240	16.00
Blk Mltplx Chnl - 4th	1429*	277	252	13,240	16.00
Blk Mltplx Subchnls, Add'l	1450	NC	NC	***	NC
Channel-to-channel Adptr	1850	326	297	12,510	13.00
Clk Cmptr & CPU Timer	2001†*	114	104	5,485	3.00
Control Store Extension	2150**	262+	238+	8,350	10.00
Expanded Control Store	2152**	421+	383+	13,420	20.50
Direct Control	3274*	146	133	5,640	4.00
Emergency Power-Off Control for 2 switches	3621	NC	NC	NC	NC
for up to 12 switches	3622	NC	NC	NC	NC
1401/1440/1460 Compat	4457	NC	NC	***	NC
1401/1440/1460, 1410/7010 Compatibility	4458	NC	NC	***	NC
Integrated Storage Control	4660**	1,007+	915+	40,460	101.00
Multiplexer Subchannels, Add'l					
128 subchannels	4953	NC	NC	***	NC
256 subchannels	4954	NC	NC	***	NC
Register Expansion	6111**	24+	22+	662	4.00
3210 Model 1 Adapter	7844*	153	140	7,410	4.00
3210 Model 2 Adapter	7845*	123	112	5,925	6.50
3215 Adapter	7855*	215	196	10,380	6.50
Two Channel Switch	8100	205+	186+	7,075	10.00
Word Buffer	8810†*	247	225	11,780	6.50

+ MAC/MRC and TLP/MLC prices effective June 1, 1979.

† 3145-3 prerequisite feature ... see M 3145 pages (special features) for details.

* Feature supplies CPU diskette.

** Feature supplies ISC diskette.

*** CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. \$405 on purchased machines when combined with changes subject to a distribution fee to include any number of diskette-only changes ordered on the same diskette.

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**3148 PROCESSING UNIT**

Purpose: Provides main and control storage plus arithmetic and logic circuits for the S/370 model 148.

Model

J	1,048,576 Bytes of Processor Storage
K	2,097,152 Bytes of Processor Storage

Highlights: 1,048,576 bytes or 2,097,152 bytes of processor storage are provided. CPU cycle time ranges from 180 to 270 nanoseconds depending upon the internal operation being performed. Sixteen general purpose and four floating point registers are provided.

Standard Features Include: Advanced Control Program Support ... APL Assist ... Audible Alarm ... Byte Oriented Operand ... 1 Byte Multiplexer Channel ... 64 Byte Multiplexer Subchannels ... 4 Block Multiplexer Channels ... 64 Block Multiplexer Subchannels ... Channel Command Retry ... Channel Indirect Addressing ... Clock Comparator and CPU Timer ... Console File ... Control Registers ... Dynamic Address Translation ... Error Checking and Correction (in Main and Control Storage) ... Extended Control Mode ... Extended Control-Program Support ... Extended Precision Floating Point ... Interval Timer ... Machine Check Handling ... Microprogram Instruction Retry ... OS/DOS Compatibility ... Program Event Recording ... Storage Protection (Store and Fetch) ... S/370 Universal Instruction Set ... Time of Day Clock ... Word Buffer.

Control Storage: 121,072 bytes of Reloadable Control Storage are provided in addition to main storage. This permits emulator and control routines to function. The Reloadable Control Storage is housed in the CPU and is loaded from the Console File. Reloadable Control Storage is not available to the user.

Virtual Storage: Virtual Storage capability is provided to increase the effective utilization of main storage.

Console File (Standard): This is the basic microprogram loading device for the system. The console file contains a small file device that provides all of the microcode for the system on removable magnetic disks. The several disks that will be supplied with the system will supply all of the required microcode for FE diagnostics, basic systems features, plus the optional features ordered for the system.

Console Function: A display console is standard ... includes a cathode ray tube, and a keyboard ... functions as an operator's I/O console to communicate with the operating system ... standard attachment for an optional 3286 Printer mdl 2 or 3287 Printer mdl 1 or 2 for hard copy output. CRT can accommodate twenty-four 80-character lines of information. A system control panel is also located on the 3148 for additional operator communications with the system.

Three console modes are available - "Printer-Keyboard" Mode, "Display" Mode, "115/125 Console-Display-Emulation" Mode.

In "Printer-Keyboard" mode, the display console uses the keyboard for input and the CRT and a recommended 3286 Printer mdl 2 or 3287 Printer mdl 1 or 2 for output. The CRT, keyboard and printer appear to the system as a 3215 Console Printer-Keyboard. "Printer-Keyboard" mode is supported by DOS, DOS/VS, OS/360, OS/VS and VM/370.

In "Display" mode, the keyboard is used for input, the CRT with 24 lines by 80 characters/line for output, and DIDOCs or equivalent support is required. DOS/VS does not support Display Mode. The 3286 Printer mdl 2 or 3287 Printer mdl 1 or 2 (optional) has a separate address and requires MCS support or equivalent. When present, the printer appears to the system as a 3213 Console Printer.

In "115/125 Console-Display-Emulation" mode, the keyboard is used for input, the CRT is used for output, and the CRT displays twelve 56-character lines of information. The 3286 Printer mdl 2 or 3287 Printer mdl 1 or 2 is optional. When present, the printer emulates a 5213 Printer mdl 1 and acts as a slave unit to the display console. That is, the 3286 Printer mdl 2 or 3287 Printer mdl 1 or 2 is not addressable in this mode. The "115/125 Console-Display-Emulation" mode is available in DOS/VS Rel. 28 and above.

The display console provides the capability to select three aspects of the system's environment at IMPL time:

Console Mode - see above (Mode descriptions)

CPU Mode (3148 or 3145) - see Programming Features

Unit addresses of natively attached I/O (except for those attached to the Integrated Storage Control)

These selections will be recorded on the console file for permanent reuse until such time as any new selection is made during a

subsequent IMPL. **NOTE:** This is the only user access to the console file.

Input/Output Files:

Byte Multiplexer Channel - one is standard ... functionally equivalent to the byte multiplexer channel on the S/370 mdls 145 ... provides eight control unit positions ... in byte mode, permits simultaneous operation of many low-speed devices ... in burst mode, handles one high-speed unit.

Block Multiplexer Channels - four are standard ... each contains the Word Buffer ... as described, each Block Multiplexer Channel approximates 1.85 megabytes/second ... ability to "Block Multiplex" provides greater channel efficiency when using direct access storage devices equipped with rotational position sensing ... devices on these channels which cannot use block multiplexing will function as if attached to selector channels.

Subchannels - on the byte multiplexer channel, 64 subchannels are provided as standard with the option of 128 or 256 (see "Special Features") ... for the four block multiplexer channels 64 block multiplexer subchannels (UCWs) are provided as standard with the option of 128, 256 or 512 (see "Special Features") ... the number of block multiplexer subchannels (UCWs) chosen will be shared by the number of Block Multiplexer Channel(s) attached to the system.

Input/Output Attachment

Non-Native - a wide variety of I/O devices may be attached to the S/370 mdl 148 via the standard byte multiplexer channel or any of the four standard block multiplexer channels.

Native - the following integrated I/O attachments/adapters are provided for controlling the designated I/O devices:

Integrated 3203-4 Printer Attachment, First Printer (optional) - provides the capability to natively attach the 3203 Printer mdl 4 as the first systems printer.

Integrated 3203-4 Printer Attachment, Second Printer (optional) - provides the capability to natively attach the 3203 Printer mdl 4 as the second systems printer.

Integrated Console Printer Adapter (standard) - provides the capability to natively attach the optional 3286 Printer mdl 2 or 3287 Printer mdl 1 or 2 as a hard copy printer.

Integrated Storage Control (optional) - allows native attachment of 3333 Disk Storage and Control modules (with 3330 modules) and/or 3340 Disk Storage mdl A2s (with 3340 B mdls and/or 3344s) and/or 3350 Disk Storage mdls A2/A2F (with 3350 B2/B2F, C2/C2F mdls) ... requires an available control unit position on a block multiplexer channel ... block multiplexing and rotational position sensing require one unshared subchannel on the block multiplexer channel per logical device.

Programming Features:

Advanced Control Program Support (standard) - provides four additional instructions and an additional function ... Compare and Swap ... Compare Double and Swap ... Insert PSW Key ... Set PSW Key from Address ... Clear I/O Function.

APL Assist (standard) - this feature is an APL emulator. It replaces functions performed by the APL software interpreter. This feature can provide a performance improvement for many APL applications when used with VS APL PP #5748 AP1.

IMPL 3145 CPU Mode Selection - provides the capability to "run" on S/370 mdl 148 any SCP which will "run" today on a S/370 mdl 145. No performance degradation or loss of S/370 mdl 145 recovery from error capabilities will be experienced in this mode. That is, in 3145 CPU Mode, the improved hardware performance of the S/370 mdl 148 will be available to the user. Moreover, the user will have the same recovery capabilities on the S/370 mdl 148 as he has on a S/370 mdl 145 when 3145 CPU Mode is selected. **NOTE:** S/370 mdl 148 Extended Logout/EREP is not supported in this mode.

Extended Control-Program Support (standard) - the S/370 mdl 148 includes Extended Control-Program Support. This is a hardware assist that reduces the CPU time needed to execute certain frequently used supervisor functions in both VS-1 and VM/370.

The functional areas for VM/370 include:

- Virtual Machine I/O
- Storage Management
- Page Management
- SVC Handler
- Privileged Instruction Interfaces
- Dispatching
- Virtual Interval Timer



3148 Processing Unit (cont'd)

For VS-1 the functional areas are:

- Storage Management
- IOS
- SVC FLIH
- System Trace
- Page Management

PREREQUISITE: Each S/370 mdl 148 requires a 3047 Power Unit ... see 3047.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Cabling: #9080 for below the floor, or #9081 for on the floor.
 [3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[4] Minimum Configuration: See "Minimum Configurations" in "Systems" for minimum I/O units required in S/370 mdl 148.

[5] Console Table (Reading Board) Extension: #9824 for extension to operator's right, or #9825 for extension to operator's left. **NOTE:** Extension direction may not be changed in the field.

[6] **RETAIN/370:** #9570 for non-use of FE DAU, #9571 for first CPU using FE DAU, #9572 for second CPU using FE DAU, or #9573 for third CPU using FE DAU. Customer must provide interface for FE DAU to the telephone line.

NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.

[7] Shipping Instructions: Unless otherwise specified, shipping dimensions of the 3148 Frame 01 (CPU) are 31-1/2" wide x 70" long x 60" high. Removal of the side covers will reduce the width to 29-1/2". If further reduction in length is required, specify #9692. Shipping dimensions will then be 29-1/2" wide x 60" long x 60" high.

[8] Emergency Power-Off Control: May be required ... see "Special Features" and S/370 Manual, Installation Information Physical Planning, for requirements.

Prices:	Mdl	MRC	MLC 4 Yr	Purchase	MMMC
3148	J	\$19,000	\$17,280	\$438,750	\$2,235
	K	22,040	20,050	513,750	2,405

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Maintenance: A Per Call: 3 Purchase Option: 55%
 Metering: Base Unit Warranty: A Useful Life Category: 2
 Termination Charge Months: 6 Termination Charge Percent: 25%
 Model/Feature Additional Charge in lieu of AU Charge: 15%
 Upper Limit Percent: 5%

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model J to Model K \$75,000

SPECIAL FEATURES

BLOCK MULTIPLEXER SUBCHANNELS, ADD'L (#1450). To increase the number of I/O devices on the block multiplexer channels, the number of subchannels (UCWs) can be increased by specifying one of the following: #9581 for 128 ... #9582 for 256 ... #9583 for 512. The number of subchannels selected will be shared by the Block Multiplexer Channel(s) attached to the system. **Field Installation:** Yes.

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (either S/360, S/370, or 4341 Processor). Only one of the processors requires this feature. Uses two control unit positions on each of the connected channels. **Maximum:** One **Field Installation:** Yes.

CONTROL STORE EXTENSION (#2150). Provides additional control storage for microprogram use on the ISC (#4660) ... see "Specify" under Integrated Storage Control (#4660) to determine when required. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Expanded Control Store (#2152).

EXPANDED CONTROL STORE (#2152). Provides additional control storage for microprogram use on the ISC (#4660) ... see "Specify" under Integrated Storage Control (#4660) to determine when required. **Limitation:** Cannot be installed with Control Store Extension (#2150). **Maximum:** One. **Field Installation:** Yes.

DIRECT CONTROL (#3274). Provides two instructions, Read

‡ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

Direct and Write Direct and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in S/360 - Direct Control Feature - OEM, SRL GA22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide, in effect, a single emergency power-off switch in a "room" or "area" ... see Emergency Power-Off Control under S/370 mdl 148 in "Systems." **Field Installation:** Yes.
 #3621 - to interconnect two emergency power-off switches ...
 #3622 - to interconnect up to twelve emergency power-off switches.

1401/1440/1460 COMPATIBILITY (#4457). Microprogram controlled feature which, in combination with special software, permits the system to execute 1401/1440/1460 instructions. **Field Installation:** Yes.

1401/1440/1460, 1410/7010 COMPATIBILITY (#4458). Gives 1401/1440/1460 compatibility, plus 1410/7010 compatibility. **Field Installation:** Yes.

INTEGRATED STORAGE CONTROL (#4660). Provides for the attachment of 3333s (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdl A2s/A2Fs ... see DASD Configuration under Specify, below. Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl Bs and/or 3344s to the 3340 mdl A2 or by attaching 3350 mdl Bs and/or a mdl C to the 3350 mdl A2 or A2F ... see DASD Configuration table below and 3330, 3333, 3340, 3344, 3350 "Machines" pages. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Requires a control unit position on a block multiplexer channel. Block Multiplexing and rotational position sensing require one unshared subchannel on the block multiplexer channel per logical device. **Specify:** The available combinations of storage devices which can be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required DASD Specify Features" are installed. Based on the DASD, and the special features listed below being ordered for them, order the required DASD Specify Feature(s). [Note that #9190 is 3340 Fixed Head Attachment for #9314 and #9315 and is not specified for #9317 or #9318.]

R 4yr

J	22.1	25.4
K	23.3	25.6



3148 Processing Unit (cont'd)
ISC (#4660) WITH ONE CHANNEL OR WITH TWO CHANNEL SWITCH (#8100)

DASD Configuration	Required DASD Specify Features *						
	9313†	9314†	9314† 9190†	9315†	9315† 9190†	9317†	9318†
3333 Only	One or two 3333s with associated 3330s	x	x				
	Up to four 3333s with associated 3330s			xx			
3340 Only	String Switch (8150) on any 3333	x					
	One or two 3340 mdl A2s with associated mdl B1/B2s	x	x	x		x	
	Up to four 3340 mdl A2s with associated mdl B1/B2s				xx	xx	
3340/3344	String Switch (8150) on any 3340 mdl A2		x		x	x	x
	Fixed Head Feature (4301/4302) on any 3340			x	xx	x	
3333/3340 (not 3344)	Up to four 3340 mdl A2s of which up to two may attach 3344s					x	x
	String Switch (8150) on any 3340 mdl A2 and/or Fixed Head Feature on any 3340 (4301/4302)						x
3350 Only	3333s and 3340 mdl A2s (any combination of two, three, or four) each with associated drives				xx	xx	
	String Switch (8150) on any 3333 or 3340 mdl A2				x	x	
3333/3340/3350 (not 3344)	Fixed Head Feature (4301/4302) on any 3340				xx		
	Up to four 3350 mdl A2s/A2Fs w associated mdl B2s/B2Fs, C2/C2F						xx
3333/3340/3350 (not 3344)	String Sw (8150) on any 3350 mdl A2/A2F, C2/C2F						x
	2333s, 3340 mdl A2s and 3350 mdl A2s/A2Fs (any combination of 2, 3 or 4) with associated drives						xx
3333/3340/3350 (not 3344)	String Sw (8150) on any 3333, 3340 mdl A2, or 3350 mdl A2/A2F, C2/C2F and/or Fixed Head Fea (4301/4302) on any 3340						x

† ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

* Any change to an installed DASD Configuration requires an MES ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.

** Control Store Extension (#2150) is prerequisite. With #9315, the ISC requires 32 contiguous device addresses regardless of the number of drives attached.

+ Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 mdl A2s on the first and third strings may attach up to three 3340 mdl B1s, B2s and/or 3344s in any combination. The 3340 mdl A2 on the second string may attach up to three 3340 mdl B1/B2s. The 3340 mdl A2 on the fourth string may attach one 3340 mdl B1 or B2.

++ Expanded Control Store (#2152) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 8 or 16 or 32 or 64 device addresses depending upon the DASD configuration installed and whether any 3350 drive is in 3330-1 compatibility mode.

NOTE: Customers who may elect to purchase Control Store Extension (#2150) and later upgrade to Expanded Control Store (#2152) should consider the purchase of Expanded Control Store (#2152) initially because this field upgrade requires replacement of Control Store Extension (#2150) and installation of Expanded Control Store (#2152). The prerequisite of Control Store Extension (#2150) for #9315 or #9317 can be satisfied by Expanded Control Store (#2152).

MULTIPLEXER SUBCHANNELS, ADD'L (#4953, 4954). To increase the number of I/O devices on the byte multiplexer channel, the number of subchannels can be increased by specifying one of the following: #4953 for 128, or #4954 for 256. The maximum

number of shared subchannels is eight. When 256 multiplexer subchannels are installed there are NO shared subchannels. Note: The number of Multiplexer Subchannels does not affect the number of UCWs specified for the Block Multiplexer Channel(s). See Block Multiplexer Subchannels, Add'l (#1450) specify. Field Installation: Yes.

REGISTER EXPANSION (#6111). Provides additional registers for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (#4660) to determine when required. Maximum: One. Field Installation: Yes.

INTEGRATED 3203-4 PRINTER ATTACHMENT, FIRST PRINTER (#8075). Provides the capability to natively attach the 3203 Printer mdl 4. Maximum: One. Field Installation: Yes. Specify: #9423f to allow unit address definition of the natively attached 3203 Printer mdl 4 from the display console keyboard.

INTEGRATED 3203-4 PRINTER ATTACHMENT, SECOND PRINTER (#8076). Provides the capability to natively attach a second 3203 Printer mdl 4. Maximum: One. Field Installation: Yes. Specify: #9424f to allow unit address definition of the second natively attached 3203 Printer mdl 4 from the display console keyboard. Prerequisite: Integrated 3203-4 Printer Attachment, First Printer (#8075).

TWO CHANNEL SWITCH (#8100). To attach the Integrated Storage Control (#4660) to a second channel. ... the two channels may be on the same or different CPUs. Switching is under program control. The ISC feature in the 3148 can be dedicated to a single channel by means of an Enable/Disable switch. Maximum: One. Field Installation: Yes. Prerequisites: See "Prerequisites" under ISC (#4660).

Special feature Prices:	MLC			
	MRC	4 yr	Purchase	MMMC
Blk Mplx Subchan Add'l #1450	NC	NC	***	NC
Channel-to-Chan Adptr 1850	\$326	\$297	\$12,510	\$14.00
Control Store Extension 2150	262*	238*	8,350	11.00
Expanded Control Store 2152	421*	383*	13,420	22.50
Direct Control 3274	146	133	5,640	4.00
Emergency Power-Off Control for 2 switches 3621	NC	NC	NC	NC
for up to 12 switches 3622	NC	NC	NC	NC
1401/1440/1460 Compat 4457	NC	NC	***	NC
1401/1440/1460, 1410/7010 Compatibility 4458	NC	NC	***	NC
Int Storage Control 4660	1,007*	915*	40,460	101.00
Multiplexer Subchannels, Add'l 128 subchannels 4953	NC	NC	NC	NC
256 subchannels 4954	NC	NC	NC	NC
Register Expansion 6111	24*	22*	662	4.00
Integrated 3203-4 Printer Attachment, First Printer 8075	180	164	4,750	30.00
Second Printer 8076	180	164	4,750	30.00
Two Channel Switch 8100	205*	186*	7,075	11.00

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* MRC and MLC prices effective June 1, 1979.

f CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

† Feature supplies CPU diskette.

‡ Feature supplies ISC diskette.

*** CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. \$405 on purchased machines when combined with changes subject to distribution fee to include any number of diskette-only changes ordered on the same diskette.

**3155 PROCESSING UNIT**

[The 3155 is no longer available ... features and model changes can be ordered on an "as available" basis.]

Purpose: Performs arithmetic, logic and control functions for a S/370 mdl 155.

Model H	Used with one 3360 mdl 1 in a S/370 mdl H155 (262,144 bytes).
Model HG	Used with one 3360 mdl 2 in a S/370 mdl HG155 (393,216 bytes).
Model I	Used with one 3360 mdl 3 in a S/370 mdl I155 (524,288 bytes).
Model IH	Used with one 3360 mdl 1 and one 3360 mdl 3 in a S/370 mdl IH155 (786,432 bytes).
Model J	Used with two 3360 mdl 3s in a S/370 mdl J155 (1,048,576 bytes).
Model JI	Used with three 3360 mdl 3s in a S/370 mdl JI155 (1,572,864 bytes).
Model K	Used with four 3360 mdl 3s in a S/370 mdl K155 (2,097,152 bytes).

Highlights: Depending upon the model, can attach up to 2,097,152 bytes of processor storage with a 2.1 microsecond cycle time ... 16 byte parallel data flow ... includes 8,192 bytes of 60 nanosecond cycle buffer storage which is transparent to the programmer and reduces the effective cycle time of processor storage. Sixteen general purpose and four floating point registers are implemented in high speed internal circuits with a four byte data flow. The 115 nanosecond cycle CPU and I/O functions are controlled by a 69 nanosecond access read-only storage.

Standard features include: universal instruction set ... 14 new instructions ... interval timer ... time-of-day clock ... store and fetch protect ... byte oriented operand feature ... error checking and correction code on main storage ... instruction retry ... channel retry ... one byte multiplexer channel ... block multiplexer channels number one and two.

Byte Multiplexer Channel — permits simultaneous operation of many low-speed devices ... can be operated in "burst" mode for attachment of high-speed devices. For OS exclusion, refer to SRL GC28-6554, *System/360 Operating Systems System Generation*. Eight control unit positions are provided on the channel. The number of subchannels depends upon processor storage size ... ranges from 128 to 256 ... can be expanded on larger size processors to 512 by adding Second Byte Multiplexer Channel (#4990) in lieu of Block Multiplexer Channel number 4. See "Special Features."

Block Multiplexer Channels — up to five ... first two are standard ... up to three more can be attached. See "Special Features." Permits simultaneous operation of high-speed devices ... ability to "Block Multiplex" provides greater channel efficiency when using direct access storage devices equipped with rotational position sensing or buffered devices ... provides block multiplexing compatible with the same function on the 2880 Block Multiplexer Channel ... operates as a conventional selector channel otherwise.

Model	Processor Storage (bytes)	Byte Multiplexer Subchannels	Block Multiplexer Subchannels	
			Non-shared	Shared
H	262,144	128	96	16
HG	393,216	192	160	16
I	524,288	256	224	16
IH	786,432	256*	252	16
J	1,048,576	256**	480	16
JI	1,572,864	256**	480	16
K	2,097,152	256**	480	16

* Can be increased to 384 by adding 2nd Byte Multiplexer Channel (#4990).

** Can be increased to 512 by adding 2nd Byte Multiplexer Channel (#4990).

Console Function — a standard system control panel is located on the 3155. It has switches and lights necessary to operate and control the system. A systems console I/O function is provided by adding either a 3210 Console Printer-Keyboard mdl 1 (15.5 cps) or a 3215 Console Printer-Keyboard (85 cps) mounted on the console table reading board. One of these is required. See "Special Features" for attachment features.

A 3210 Mdl 2 Adapter (#7845) can also be used to attach a remote 3210 Console Printer-Keyboard mdl 2.

PREREQUISITES: In addition to appropriate 3360 Processor

Storage(s), each 3155 also requires a 3210 Console Printer-Keyboard mdl 1 or a 3215 Console Printer-Keyboard.

Each model of the 3155 has been designed for interconnected operation with a specified number of 3360 Processor Storage Units. Customers who wish to order the 3155 for use without the specified number of 3360s should submit an RFP to provide the necessary safety elements (covers, connectors, etc.) and the changes required for quality testing and installing.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Console Table (Reading Board) Extension: #9824 for extension to operator's right, or #9825 for extension to left.

[3] Cabling: #9080 for below floor, or #9081 for on the floor.

[4] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[5] Emergency Power-Off Control: May be required ... see "Special Features" below and *S/370 Installation Manual - Physical Planning* for requirements.

[6] Minimum Configuration: See "Minimum Configurations" in "Systems" for minimum I/O units required in a S/370 mdl 155.

[7] RETAIN/370: #9570 for non-use of FE DAU, #9571 for first CPU using FE DAU, #9572 for second CPU using FE DAU, #9573 for third CPU using FE DAU. Customer must provide interface for FE DAU to telephone line.

PRICES:	Mdl	MAC/MRC	Purchase	MMMM
3155	H	\$21,180	\$1,017,300	\$1,675
	HG	21,210	1,018,500	1,675
	I	21,240	1,019,700	1,675
	IH	21,750	1,044,600	1,690
	J	21,810	1,047,000	1,690
	JI	23,600	1,134,900	1,740
	K	24,170	1,162,200	1,745

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Warranty: A

Purchase Option: 55% Maintenance: D

Metering: Base Unit

Useful Life Category: 2

Per Call: 3

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	HG	I	IH	J	JI	K
H	\$1,200	\$2,400	\$27,300	\$29,700	\$117,600	\$144,900
HG		1,200	26,100	28,500	116,400	143,700
I			24,900	27,300	115,200	142,500
IH				2,400	90,300	117,600
J					87,900	115,200
JI						27,300

The model conversion prices above are applicable only when the 3155 is used with the combinations of 3360 Processor Storages as indicated under "Models" above. Prices do not include those of the required 3360(s).

SPECIAL FEATURES

BLOCK MULTIPLEXER CHANNEL (#1433-1435). Each adds a channel for attachment of I/O devices ... for devices that can be attached see S/370 in "Systems." The channel permits overlapped I/O operation with processing. Eight control unit positions are provided on each channel. #1433 — for third block multiplexer channel ... #1434 — for fourth ... #1435 — for fifth. **Limitation:** #1434 cannot be installed if Second Byte Multiplexer Channel (#4990) is installed. **Field Installation:** Yes. **Prerequisites:** #1434 requires #1433 ... #1435 requires #1434 or #4990.

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (either S/360 or S/370). Only one of the processors requires this feature. Uses one control unit position on each of the connected channels. Function can be expanded under program control so that the adapter will operate as a standard control unit. **Maximum:** One. **Field Installation:** Yes.

DIRECT CONTROL (#3274). Provides two instructions, "Read Direct" and "Write Direct," and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes, between two cable-connected processing units, or a cable-connected processing unit and external devices. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:**

† NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.



3155 Processing Unit (cont'd)

External devices must meet the interface specifications outlined in S/360 - Direct Control Feature - OEMI, SRL GA22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide, in effect, a single emergency power-off switch in a "room" or "area" ... see Emergency Power-Off under S/370 in "Systems." #3621 -- to interconnect two emergency power-off switches ... #3622 -- to interconnect up to twelve emergency power-off switches. **Field Installation:** Yes.

EMERGENCY POWER-OFF PANEL EXPANSION (#3625). The basic S/370 mdl 155 provides for EPO control for up to 16 control units. When single mdl 155 configurations exceed this limit, Emergency Power-Off Panel Expansion (#3625) should be ordered. Each #3625 attaches up to four additional EPO terminations. **Maximum:** Five. Where assistance is needed in determining requirements, consult with Installation Planning Representatives.

EXTENDED PRECISION FLOATING POINT (#3700). Provides instructions to handle extended precision (28-hexadecimal digit fraction) floating point operands. Extended precision operands may also be rounded to long-precision format, which in turn may be rounded to short-precision format. **Limitation:** Cannot be installed with 7070/7074 Compatibility (#7117). **Field Installation:** Yes.

1401/40/60, 1410/7010 COMPATIBILITY (#3950). Provides the system with the ability to execute 1401/1440/1460 and 1410/7010 instructions under specific conditions of minimum and matching configurations ... see P 360N pages for DOS and P 360C pages for OS. **Field Installation:** Yes.

SECOND BYTE MULTIPLEXER CHANNEL (#4990). [Models IH, J, JI, K] Provides the same function as the standard multiplexer channel ... increases the number of subchannels to 384 on mdl IH, and to 512 on mdls J, JI and K. Takes the place of block multiplexer channel number four. **Limitation:** Cannot be installed with Block Multiplexer Channel No. 4 (#1434). **Field Installation:** Yes. **Prerequisite:** Block Multiplexer Channel No. 3 (#1433).

OS/DOS COMPATIBILITY (#5450). Provides the system with the ability to execute DOS programs under specific conditions ... see P 360C pages in "Programming." **Field Installation:** Yes.

7070/7074 COMPATIBILITY (#7117). Provides the system with the ability to execute 7070/7074 instructions under specific conditions ... see P 360C pages. **Limitation:** Cannot be installed with Extended Precision Floating Point (#3700). **Field Installation:** Yes.

3210 MDL 1 ADAPTER (#7844). To attach a 3210 Console Printer-Keyboard mdl 1 (15.5 cps) for system console I/O ... includes an alter-display ability. Position of the unit to the right or left of the operator depends upon the Console Table Extension (#9824 or #9825) ... see "Specify." **Limitation:** Cannot be installed with 3215 Adapter (#7855). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Uses one address on the standard byte multiplexer channel but does not use a control unit position.

3210 MDL 2 ADAPTER (#7845). To attach a free-standing 3210 Console Printer-Keyboard mdl 2, for remote system console I/O. **Limitation:** Maximum distance from the console is 75 feet. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisite:** Either a 3210 Mdl 1 Adapter (#7844) or a 3215 Adapter (#7855) ... uses one control unit position on a byte or block multiplexer channel.

3215 ADAPTER (#7855). To attach a 3215 Console Printer-Keyboard (85 cps) for system console I/O ... includes alter-display ability. Position of the unit to the right or left of the operator depends upon the Console Table Extension (#9824 or #9825) ... see "Specify." **Limitation:** Cannot be installed with 3210 Mdl 1 Adapter (#7844). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Uses one address on the standard byte multiplexer channel but does not use a control unit position.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC
Block Multiplexer Channel			
third	#1433 \$ 429	\$14,970	\$12.00
fourth	1434 400	13,930	9.00
fifth	1435 199	7,005	4.50
Channel-to-channel Adapter	1850 400	13,930	8.00
Direct Control	3274 114	3,425	4.00
Emergency Power-Off Control			
for 2 switches	3621 NC	NC	NC
for up to 12 switches	3622 NC	NC	NC
Emergency Power-Off Panel Expansion	3625 NC	NC	NC
Extnd Precision Fltg Point	3700 199	9,615	16.00
1401/40/60/1410/7010 Cmpt	3950 457	18,290	16.00
2nd Byte Multiplx Channel	4990 429	14,970	12.00
OS/DOS Compatibility	5450 285	11,430	16.00
7070/7074 Compatibility	7117 1,025	49,390	58.50
3210 Mdl 1 Adapter	7844 171	8,240	8.00
3210 Mdl 2 Adapter	7845 193	9,315	8.00
3215 Adapter	7855 228	10,910	8.00

Dynamic Address Translation (Purchased Models H, HG, I, IH, J, JI and K)

Purchased installed model 155s may be field converted to 155-II through installation of the Dynamic Address Translation Facility.

Customer price quotations and customer order acknowledgement letters for purchase MESSs must state: "Installation of model change to the 'II' Model involves the removal of parts which become the property of IBM."



IBM 3158 PROCESSING UNIT

Purpose: Performs arithmetic, logic, processor storage and control functions for a S/370 mdl 158.

Models			Bytes of Processor Storage
I	AP1	MP1	524,288
J	AP2	MP2	1,048,576
J1	AP3	MP3	1,572,864
K	AP4	MP4	2,097,152
KJ	AP5	MP5	3,145,728
L	AP6	MP6	4,194,304
LJ	AP7		5,242,880
LK	AP8		6,291,456

Highlights: Depending upon the model contains up to 6,291,456 bytes of monolithic processor storage with a cycle time of 1,035 nanoseconds for a 16-byte read, of 690 ns for an 8-byte write, 920 ns for a write of 1 to 7 bytes, and 920 ns for a write of 9 to 16 bytes ... 16 byte parallel data flow ... includes 8,192 bytes of buffer storage which is transparent to the programmer and reduces the effective cycle time of processor storage. Sixteen general purpose and four floating point registers are implemented in high speed internal circuits with a four byte data flow. The 115 nanosecond cycle CPU and I/O functions are controlled by reloadable control storage. An optional integrated storage controls feature allows direct attachment of 3330, 3340, 3344, 3350 direct access storage devices. Attached processing is provided by attachment of a 3052 Attached Processing Unit mdl 1.

Standard features include: S/370 universal instruction set ... interval timer ... store and fetch protect ... byte oriented operand feature ... error checking and correction code on main storage ... instruction retry ... channel retry ... one byte multiplexer channel ... block multiplexer channels number one and two ... dynamic address translation ... extended control mode ... program event recording ... time-of-day clock with clock comparator ... CPU timer ... channel indirect addressing function for channels ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... clear I/O. Four additional instructions on MP models -- signal processor ... set prefix ... store prefix ... store CPU address.

Byte Multiplexer Channel: Permits simultaneous operation of many low-speed devices. Can be operated in "burst" mode for attachment of high-speed devices. For OS exclusion, refer to SRL GC28-6554, *OS System Generation*, ... for OS/VS exclusion, refer to SRL GC26-3791, *OS/VS1 System Generation*, and SRL GC26-3792, *OS/VS2 System Generation*. Eight control unit positions are provided on the channel.

Block Multiplexer Channels: Up to five ... first two are standard ... up to three more can be attached. See "Special Features." Permits simultaneous operation of high-speed devices ... ability to "Block Multiplex" provides greater channel efficiency when using direct access storage devices equipped with rotational position sensing or buffered devices ... provides block multiplexing compatible with the same function on the 2880 Block Multiplexer Channel ... operates as a conventional selector channel otherwise.

Subchannels: 256 non-shared subchannels or 120 non-shared and 8 shared subchannels on 1st Byte Multiplexer Channel ... 256 unshared or 120 non-shared and 8 shared subchannels on 2nd Byte Multiplexer Channel ... 16 shared subchannels on Block Multiplexer Channels ... 480 unshared subchannels on Block Multiplexer Channels.

Console Function: A Display Console is standard ... includes light pen, keyboard, cathode ray tube, two console files and control store ... functions as a manual console for IPL, reset, etc., as an operator's console to communicate with the operating system, an indicator display console, and as a diagnostic console for maintenance ... optional attachment for a 3213 Printer (85 cps) for hard copy output. CRT has twenty-five 80-character lines of information; as a system console, the last line displays machine status. Optional attachment for a 3056 Remote System Console for console operation from an additional keyboard and cathode ray tube up to 150 feet from the processor.

In "Printer-Keyboard" mode, the Display Console uses the keyboard for input and CRT and mandatory 3213 for output. It appears to the system as a 3215, and is supported by DOS, DOS/VS, OS/360, OS/VS and VM/370. In "Display" mode, the keyboard and light pen are used for input, the CRT for output, and DIDOCS support or equivalent is required. The 3213 (optional) has a separate address and requires MCS support or equivalent.

The Display Console replaces the conventional indicators and switches with displays, and diagnostics can be loaded under light pen control from one of the console files.

PREREQUISITES: Each AP system requires (1) a 3158 A series processing unit, (2) a 3052 APU mdl 1, (3) a 3056 Remote System Console mdl 1. Identical MP CPU models are required for a

multiprocessor system. The 3058 Muisystem Unit is required for each one or two processor MP system.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Console Table (Reading Board) Extension: #9824 for extension to operator's right, or #9825 for extension to left.

[4] Cabling: #9080 for below the floor, or #9081 for on the floor.

[5] Emergency Power-Off Control: May be required ... see "Special Features" and S/370 *Installation Manual - Physical Planning*, GC22-7004 for details. If two processors are installed and the 3052 is to be added and emergency power off ability is required on the systems, then the expanded Emergency Power Off Control (#3622) should be ordered for the host processor.

[6] Minimum Configuration: See "Minimum Configurations" in "Systems" for minimum I/O units required in a S/370 mdl 158.

[7] RETAIN/370: Provided by integrated data adapter which is standard on the console. Customers must provide interface to telephone line.

[8] CPU Position: #9441 for left CPU in MP configuration, or #9442 for right.

[9] Processor Attach Feature: When one processor is combined with another in a multiprocessor system, each processor must contain sufficient Storage Protect capability for the total storage in the system. Therefore, each processor must add additional Storage Protect capability to reflect the storage in the remote processor. The first megabyte of Storage Protect capability for the remote processor is included in the MP1 and MP2 Processor. One Processor Attach feature is required in an MP processor for each additional megabyte, beyond the first megabyte in the remote processor. See "Special Features."

PRICES: Mdl		TLP/MLC		Purchase	MMMC
		MAC/MRC	4 Year		
3158	I	\$38,120	\$34,660	\$1,295,200	\$2,315
	J	39,640	36,045	1,332,700	2,385
	J1	41,160	37,430	1,370,200	2,455
	K	42,680	38,815	1,407,700	2,525
	KJ	46,240	42,055	1,497,700	2,735
	L	49,280	44,825	1,572,700	2,875
	LJ	52,320	47,595	1,647,700	3,015
	LK	55,360	50,365	1,722,700	3,155
	AP1	39,750	36,140	1,344,200	2,715
	AP2	41,270	37,525	1,381,700	2,785
	AP3	42,790	38,910	1,419,200	2,855
	AP4	44,310	40,295	1,456,700	2,925
	AP5	47,870	43,535	1,546,700	3,135
	AP6	50,910	46,305	1,621,700	3,275
	AP7	53,950	49,075	1,696,700	3,415
	AP8	56,990	51,845	1,771,700	3,555
	MP1	41,740	37,950	1,423,200	2,385
	MP2	43,260	39,335	1,460,700	2,455
	MP3	44,780	40,720	1,498,200	2,525
	MP4	46,300	42,105	1,535,700	2,595
	MP5	49,860	45,345	1,625,700	2,805
	MP6	52,900	48,115	1,700,700	2,945

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit Machine Group: D
Per Call: 3 Purchase Option: 55%† Warranty: A
Useful Life Category: 2 Termination Charge Months: 6
Termination Charge Percent: 25% Upper Limit Percent: 5%
Model/Feature Additional Charge in lieu of AU Charge: 15%

† Purchase Option is 50% under Term Lease Plan (TLP)



3158 Processing Unit (cont'd)
Model Changes: Field Installable.

3158 to 3158 MODEL CONVERSION PURCHASE PRICES

3158 to 3158 MP	\$128,000	(no change in memory size)
3158 to 3158AP	\$ 49,000	(no change in memory size)
3158AP to 3158MP	\$ 79,000	(no change in memory size)

3158 to 3158 MODEL UPGRADE PURCHASE PRICES

From	To	J	J1	K	KJ	L	LJ	LK
I		\$37,500						
J			\$37,500					
J1				\$37,500				
K					\$90,000			
KJ						\$75,000		
L							\$75,000	
LJ								\$75,000

From	To	MP2	MP3	MP4	MP5	MP6
MP1		\$37,500				
MP2			\$37,500			
MP3				\$37,500		
MP4					\$90,000	
MP5						\$75,000

From	To	AP2	AP3	AP4	AP5	AP6	AP7	AP8
AP1		\$37,500						
AP2			\$37,500					
AP3				\$37,500				
AP4					\$90,000			
AP5						\$75,000		
AP6							\$75,000	
AP7								\$75,000

Notes:

- There are no additional installation charges over the above model conversion and model upgrade prices.
- The above model conversions and model upgrades are field installable.
- Planning for Model Conversions and Model Upgrades: When a customer requires storage upgrades in addition to a model conversion, the changes must not be consolidated into a single Also, storage upgrades for storage above two megabytes should be ordered individually in one megabyte increments.
- When an MP storage upgrade is submitted, the proper number of Processor Attach features (#5552) for the remote processor should be ordered.
- When an AP storage upgrade is submitted, the proper number of Processor Attach features (#5552) for the 3052 APU should be ordered.
- When an upgrade to an MP system is submitted, the proper number of Processor Attach features (#5552) for the remote processor must be ordered.
- 3158 units with System/370 Extended (#7730) that are converted to an AP model require System/370 Extended, Add'l (#7731) on the AP model processing unit.
- 3158 units with System/370 Extended (#7730) that are converted to an MP model require System/370 Extended (#7730) and System/370 Extended, Add'l (#7731) on both processing units.

SPECIAL FEATURES

BLOCK MULTIPLEXER CHANNEL (#1433-1435). Each adds a channel for attachment of I/O devices ... for devices that can be attached see S/370 in "Systems." The channel permits overlapped I/O operation with processing. Eight control unit positions are provided on each channel. Channel Indirect Addressing is included in each channel. #1433 -- for third block multiplexer channel ... #1434 -- for fourth ... #1435 -- for fifth. **Limitation:** #1434 cannot be installed if 2nd Byte Multiplexer Channel (#4990) is installed. **Field Installation:** Yes. **Prerequisites:** #1434 requires #1433 ... #1435 requires #1434 or #4990.

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (either S/360, S/370 or 4341 Processor). Only one of the processors requires this feature. Uses one control unit position on each of the connected channels. Function can be expanded under program control so that the adapter will operate as a standard control unit. **Maximum:** One. **Field Installation:** Yes.

ISC CONTROL STORE EXTENSION (#2150). Provides additional control store for microprogram use on the ISC (#4650). When the Staging Adapter for ISC (#7220) is NOT ordered, see "Specify" under Integrated Storage Controls (#4650) to determine when

required. **NOTE:** When #7220 IS ordered, #2150 is prerequisite. **Maximum:** One. **Field Installation:** Yes.

EXPANDED CONTROL STORE (#2151). Provides additional control storage for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (#4650) to determine when required. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ISC Control Store Extension (#2150) and Register Expansion (#6111).

ISC/SA CONTROL STORE ADDITIONAL (#2152) Provides additional control store for microprogram use on the ICS (#4650). Required if 3350 DASD is attached to an ISC/SA (#7220). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Register Expansion (#6111), Expanded Control Store (#2151) and Staging Adapter for ISC (#7220).

DIRECT CONTROL (#3274). Provides two instructions, "Read Direct" and "Write Direct," and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes, between two cable-connected processing units, or a cable-connected processing unit and external devices. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in S/370-Direct Control Feature-OEMI, GA22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide, in effect, a single emergency power-off switch in a "room" or "area" ... see Emergency Power-Off under S/370 in "Systems." #3621 -- to interconnect two emergency power-off switches ... #3622 -- to interconnect up to twelve emergency power-off switches. **Field Installation:** Yes.

EMERGENCY POWER-OFF PANEL EXPANSION (#3625). The basic S/370 mdl 158 provides for EPO control for up to 16 control units. When single mdl 158 configurations exceed this limit, #3625 should be ordered. Each #3625 attaches up to four additional EPO terminations. **Maximum:** Five.

Field Installation: Yes.

EXTENDED PRECISION FLOATING POINT (#3700). Provides instructions to handle extended precision (28-hexadecimal digit fraction) floating point operands. Extended precision operands may also be rounded to long-precision format, which in turn may be rounded to short-precision format. This function is also included in and enabled by the OS/VS1 ECPS (Extended Control Program Support) (#8750). **Field Installation:** Yes.

1401/1440/1460, 1410/7010 COMPATIBILITY (#3950). Provides the system with the ability to execute 1401/1440/1460 and 1410/7010 instructions under specific conditions of minimum and matching configurations ... see P 360N pages for DOS and P 360C pages for OS. **Field Installation:** Yes. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730), System/370 Extended, Add'l (#7731), or with OS/VS1 ECPS (Extended Control Program Support) (#8750).

INTEGRATED STORAGE CONTROLS (ISC) (#4650). Provides for the attachment of 3333s (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdl A2s/A2Fs when Staging Adapter for ISC (#7220) is NOT ordered. Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl Bs and/or 3344s to the 3340 mdl A2 or by attaching 3350 mdl Bs and/or a mdl c to the 3350 mdl A2/A2F ... see DASD Configuration table below and 3333, 3330, 3340, 3344, 3350 "Machines" pages. The ISC is organized functionally into two separate paths with up to 16 drives per path ... up to 32 drives per path when ISC Control Store Extension (#2150) is installed. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Each ISC path requires a control unit position on a block multiplexer channel. **Specify:** The following applies only when Staging Adapter for ISC (#7220) is NOT ordered:

The available combinations of storage devices which can be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required DASD Specify Features" are installed. Based on the DASD, and the Special Features listed below being ordered for them, order the required DASD Specify Feature(s). **Note:** The selected "Required DASD Specify Feature(s)" applies to both ISC paths. Within this constraint the DASD Configuration on one ISC path may be different from that on the other ISC path.



3158 Processing Unit (cont'd)

ISC (#4650) WITH ONE CHANNEL OR WITH TWO CHANNEL SWITCH (#7905)

DASD CONFIGURATION		Required DASD Specify Features *						
		9313 †	9314 †	9314† 9190†	9315 †	9315† 9190†	9317 †	9318 †
3333 Only	One or two 3333s with associated 3330s	x	x					
	Up to four 3333s with associated 3330s				x	x		
3340 Only	One or two 3340 mdl A2s with associated mdl B1/B2s		x	x			x	
	Up to four 3340 mdl A2s with associated mdl B1/B2s				x	x	x	
3340/3344	String Switch #8150 on any 3340 mdl A2		x					
	Fixed Head Feature #4301/4302 on any 3340			x		x	x	
3333/3340 (not 3344)	Up to four 3340 mdl A2s of which up to two may attach 3344s						x	x
	String Switch #8150 on any 3340 mdl A2 and/or Fixed Head Feature #4301/4302 on any 3340						x	
3350 Only	3333s and 3340 mdl A2s (any combination of two, three or four) each with associated drives				x	x	x	
	String Switch #8150 on any 3333 or 3340 mdl A2				x		x	
3333/3340/3350 (not 3344)	Fixed Head Feature #4301/4302 on any 3340						x	x
	Up to four 3350 mdl A2s/A2Fs w associated mdl B2s/B2Fs: C2s/C2Fs							x
3333/3340/3350 (not 3344)	String Switch #8150 on any 3350 mdl A2/A2F, C2/C2F							x
	3333s, 3340 mdl A2s and 3350 mdl A2s/A2Fs (any combination of 2, 3 or 4) with associated drives							x
3333/3340/3350 (not 3344)	String Switch #8150 on any 3333, 3340 mdl A2, or 3350 mdl A2/A2F, C2/C2F and/or Fixed Head Feature #4301/4302 on any 3340							x

- † ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.
- * Any change to an installed DASD Configuration requires an MES ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.
- ** ISC Control Store Extension (#2150) is prerequisite. With #9315, each path of the ISC requires 32 contiguous device addresses regardless of the number of drives attached.
- + Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the 3830-2 uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 mdl A2s on the first and third strings may attach up to three 3340 mdl B1, B2s, and/or 3344s in any combination. The 3340 mdl A2 on the second string may attach up to three 3340 mdl B1/B2s. The 3340 mdl A2 on the fourth string may attach one 3340 mdl B1 or B2.
- ++ Expanded Control Store (#2151) and Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group each ISC path uses 8 or 16 or 32 or 64 device addresses depending upon the respective DASD configuration installed and whether any 3350 drive is in 3330-1 compatibility mode.

SECOND BYTE MULTIPLEXER CHANNEL (#4990). Provides the same function as the standard multiplexer channel ... contains Channel Indirect Data Addressing. Takes the place of Block Multiplexer Channel No. 4. **Limitation:** Cannot be installed with Block Multiplexer Channel No. 4 (#1434). **Field Installation:** Yes. **Prerequisite:** Block Multiplexer Channel No. 3 (#1433).

OS/DOS COMPATIBILITY (#5450). Provides the system with the ability to execute DOS programs under specific conditions ... see P 360C pages in "Programming." **Field Installation:** Yes. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730), System/370 Extended, Add'l (#7731), or with OS/VS1 ECPS (Extended Control Program Support) (#8750).

PROCESSOR ATTACH (#5552). [MP mdls only] One is required for each megabyte of storage over one megabyte in the remote processor of an MP system.

Remote Processor Storage Size (megabytes)	Quantity of Processor Attach Features (Required)
1/2, 1	0
1-1/2, 2	1
3	2
4	3
5	4
6	5

Field Installation: Yes. **Corequisite:** MP Model.

POWER WARNING (#5760). Provides signal to the 3158 system when power is outside specified limits. **Prerequisites:** All models require customer supplied uninterruptible power supply with line sensor. MP models also require special cable -- **Field Installation:** Yes.

REGISTER EXPANSION (#6111). Provides additional registers for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (#4650) to determine when required. **Field Installation:** Yes. **Maximum:** One.

REMOTE SWITCH ATTACHMENT (#6148). [MP models only] To attach the Two Channel Switch for ISC (#7905) to the configuration control panel on the 3058 Multisystem Unit. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Two Channel Switch for ISC (#7905).

7070/7074 COMPATIBILITY (#7117). Provides the system with the ability to execute 7070/7074 instructions under specific conditions ... see P 360C pages in "Programming." **Field Installation:** Yes. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730), System/370 Extended, Add'l (#7731), Virtual Machine Assist (#8740), or with OS/VS1 ECPS (Extended Control Program Support) (#8750).

STAGING ADAPTER FOR ISC (#7220). Enables each path of the ISC to attach a maximum of four 3333 Mdl 1 and 11 and/or 3350 Mdl A2/A2Fs with associated 3330 Mdl 1, 2 and 11 and 3350 Mdl B2/B2F and C2/C2F, for a maximum of 32 drives per path. See 3333, 3330 and 3350 for additional information. Also see note on M3333 pages for feature changes required when 3333's are retained for use with a 3851. Provides up to 64 virtual 3330 addresses for each channel interface on each path of the ISC. Provides for the attachment of up to four Data Recording Controls in one or two 3851 Mass Storage Facilities to each path of the ISC. **Maximum:** One. **Field Installation:** Yes ... must include removal of any of the following which are installed: #9190, 9313, 9314, 9315, 9317, 9318. **Prerequisites:** Integrated Storage Controls (#4650) and ISC Control Store Extension (#2150). For 3350 attachment the additional prerequisites are Expanded Control Store (#2151), Register Expansion (#6111) and ISC/SA Control Store Additional (#2152). **Limitations:** If String Switch (#8150) is installed on a 3333, see writeup for this feature on 3333 "Machines" page. 3340 drives cannot be attached to the ISC when #7220 is installed. 3350 drives attached to the ISC when #7220 is installed cannot be used as staging drives and must be designated as real in 3350 native mode only. 3350 devices may not be mixed with other type devices in the same string. **Specify:** #9319 (Staging Adapter 3333/3330/3350).

SYSTEM/370 EXTENDED (#7730). Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. **Field Installation:** Yes. **Prerequisites:** Required, together with System/370 Extended, Add'l (#7731), on each processor in an MP system and on the A-series processor in an AP system. System/370 Extended (#7730) is also required on the 3052 Attached Processing Unit in an AP system. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#3950), OS/DOS Compatibility (#5450), 7070/7074 Compatibility (#7117), Virtual Machine Assist (#8740), or with OS/VS1 ECPS (Extended Control Program Support) (#8750).

SYSTEM/370 EXTENDED, ADD'L (#7731). Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. **Field Installation:** Yes. **Prerequisites:** Required, together with System/370 Extended (#7730), on each processor in an MP system, and on the A-series processor in an AP system. System/370 Extended (#7730) is also required on the 3052 Attached Processing Unit in an AP system. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#3950), OS/DOS Compatibility (#5450), 7070/7074 Compatibility (#7117), Virtual Machine Assist (#8740), or with OS/VS1 ECPS (Extended Control Program Support) (#8750).

3056 REMOTE CONSOLE ATTACHMENT (#7820). Provides attachment to the Display Console of an optional console up to 150 feet away. **Maximum:** One. **Field Installation:** Yes.



3158 Processing Unit (cont'd)

3213 PRINTER ATTACHMENT (#7840). To attach a 3213 Printer to the Display Console for optional hard copy. **Maximum:** One. **Field Installation:** Yes.

TWO CHANNEL SWITCH FOR ISC (#7905). To provide each of the two paths of an ISC with the capability of attaching to a second channel. The channels may be on the same CPU or different CPUs. Switching is under program control. Each path of the ISC can be dedicated to a single channel by means of a Configuration Switch. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** An available control unit position and eight unshared subchannels on a system block multiplexer channel. For S/360 mdl 195 and S/370 mdls 165, 168, 195, see 2880 Block Multiplexer Channel. For S/370 mdls 135, 135-3, 138, 145, 145-3, 148, 155, 158, 3031, 3032 or 3033, see 3135, 3135-3, 3138, 3145, 3145-3, 3148 3155, 3158, 3031, 3032, 3033 respectively. For 4300 Processors, see 4341.

VIRTUAL MACHINE ASSIST (#8740). Provides assist to VS operating systems operating under VM/370 by emulation of certain privileged operations. This function is also included in and enabled by the OS/VS1 ECPS (Extended Control Program Support) (#8750). **Field Installation:** Yes. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with 7070/7074 Compatibility (#7117), System/370 Extended (#7730), or with System/370 Extended, Add'l (#7731).

OS/VS1 ECPS (EXTENDED CONTROL PROGRAM SUPPORT) (#8750). Provides assist to OS/VS1 by emulation of certain supervisor functions. This feature also includes and enables Virtual Machine Assist and Extended Precision Floating Point functions. **Prerequisite** Feature must be selected at system generation on OS/VS1 Release 6 or subsequent releases. **Limitations:** This feature cannot be loaded, at IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#3950), OS/DOS Compatibility (#5450), 7070/7074 Compatibility (#7117), or in Multiprocessing Mode. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	TLP/ MLC		Purch	MMMC
		4 Yr			
Block Multiplexer Channel					
- 3rd	#1433	\$ 463	\$ 421	\$16,160	\$14.00
- 4th	1434	432	393	15,040	11.00
- 5th	1435	215	196	7,565	5.00
Channel-to-channel Adptr	1850	432	393	15,040	9.00
ISC Control Store Extens	2150†	526	478	21,060	23.00
Expanded Control Store	2151*†	318	289	12,720	23.00
ISC/SA Control Store Add'l	2152†	318	289	12,720	23.00
Direct Control	3274	123	112	3,705	4.00
Emergency Power-Off Control for 2 switches	3621	NC	NC	NC	NC
for up to twelve switches	3622	NC	NC	NC	NC
Emerg Power-Off Panel Exp	3625	NC	NC	NC	NC
Extnd Precision Floating Pt	3700	NC	NC	NC	NC
1401/1440/1460, 1410/7010 Compatibility	3950	NC	NC	NC	NC
Integrated Storage Controls	4650†	1,920	1,745	77,600	258.00
2nd Byte Multiplexr Channl	4990	463	421	16,160	14.00
OS/DOS Compatibility	5450	NC	NC	NC	NC
Processor Attach	5552	90	82	2,700	15.00
Power Warning	5760	142	130	5,725	1.00
Register Expansion	6111	47	43	1,330	8.50
Remote Switch Attachment	6148	NC	NC	NC	NC
7070/7074 Compatibility	7117	NC	NC	NC	NC
Staging Adapter for ISC	7220*†	2,065	1,875	83,200	245.00
System/370 Extended	7730	715	650	13,000	4.00
System/370 Extd, Add'l	7731	220	200	4,000	2.00
3056 Remote Consol Attch	7820	51	47	2,545	4.00
3213 Printer Attachment	7840	114	104	5,545	1.00
Two Channel Sw for ISC	7905	351	319	14,220	23.00
Virtual Machine Assist	8740	NC	NC	NC	NC
OS/VS1 Extended Control Program Support	8750	NC	NC	NC	NC

* Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this feature involves removal of parts which become the property of IBM."

† Feature supplies ISC diskette.



IBM 3158-3 PROCESSING UNIT

Purpose: Performs arithmetic, logic, processor storage and control functions for a S/370 mdl 158.

Models			Bytes of Processor Storage
U31	A31	M31	524,288
U32	A32	M32	1,048,576
U33	A33	M33	1,572,864
U34	A34	M34	2,097,152
U35	A35	M35	3,145,728
U36	A36	M36	4,194,304
U37	A37	M37	5,242,880
U38	A38	M38	6,291,456

Highlights: Depending upon the model contains up to 6,291,456 bytes of monolithic processor storage with a cycle time of 1035 nanoseconds for a 16-byte read, of 690 ns for an 8-byte write, 920 ns for a write of 1 to 7 bytes, and 920 ns for a write of 9 to 16 bytes ... 16 byte parallel data flow ... includes 16,384 bytes of buffer storage which is transparent to the programmer and reduces the effective cycle time of processor storage. Sixteen general purpose and four floating point registers are implemented in high speed internal circuits with a four byte data flow. The 115 nanosecond cycle CPU and I/O functions are controlled by reloadable control storage. An optional integrated storage control feature allows direct attachment of 3330, 3340, 3344, 3350 direct access storage devices. 128 word instruction buffer, improved instruction execution times over the 3158, increased block multiplexer sub-channel pool over the 3158. Asymmetric multiprocessor storage. Alternate CPU power down while all storage is left available to the other processor (MP models only). Attached Processing is available by attachment of a 3052 Attached Processing Unit mdl 1.

Standard features include: S/370 universal instruction set ... interval timer ... store and fetch protect ... byte oriented operand feature ... error checking and correction code on main storage ... instruction retry ... channel retry ... one byte multiplexer channel ... block multiplexer channels number one and two ... dynamic address translation ... extended control mode ... program event recording ... time-of-day clock with clock comparator ... CPU timer ... channel indirect addressing function for channels ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... clear I/O. Four additional instructions on M models -- signal processor ... set prefix ... store prefix ... store CPU address.

Byte Multiplexer Channel: Permits simultaneous operation of many low-speed devices. Can be operated in "burst" mode for attachment of high-speed devices. For OS exclusion, refer to SRL GC28-6554, *OS System Generation*, ... for OS/VS exclusion, refer to SRL GC26-3791, *OS/VS1 System Generation*, and SRL GC26-3792, *OS/VS2 System Generation*. Eight control unit positions are provided on the channel.

Block Multiplexer Channels: Up to five ... first two are standard ... up to three more can be attached. See "Special Features." Permits simultaneous operation of high-speed devices ... ability to "Block Multiplex" provides greater channel efficiency when using direct access storage devices equipped with rotational position sensing or buffered devices ... provides block multiplexing compatible with the same function on the 2880 Block Multiplexer Channel ... operates as a conventional selector channel otherwise.

Subchannels: In a 3158-3, byte multiplexer channel 0 or 4 may have 256 non-shared subchannels less 16 or 32 for each shared subchannel. A 3158-3 block multiplexer channel may have 40 shared subchannels when the second byte multiplexer channel is not installed. When the second byte multiplexer channel is installed, the block multiplexer channel may have 32 shared subchannels. The block multiplexer channel may have 736 nonshared subchannels when the second byte multiplexer channel is not installed on the 3158-3 and 480 nonshared subchannels when the second byte multiplexer channel is installed.

Console Function: A Display Console is standard ... includes light pen, keyboard, cathode ray tube, two console files and control store ... functions as a manual console for IPL, reset, etc., as an operator's console to communicate with the operating system, an indicator display console, and as a diagnostic console for maintenance ... optional attachment for a 3213 Printer (85 cps) for hard copy output. CRT has twenty-five 80-character lines of information; as a system console, the last line displays machine status. Optional attachment for a 3056 Remote System Console for console operation from an additional keyboard and cathode ray tube up to 150 feet from the processor.

In "Printer-Keyboard" mode, the Display Console uses the keyboard for input and CRT and mandatory 3213 for output. It appears to the system as a 3215, and is supported by DOS, DOS/VS, OS/360, OS/VS and VM/370. In "Display" mode, the keyboard and light pen are used for input, the CRT for output, and DIDOCS support or equivalent is required. The 3213 (optional) has a separate address and requires MCS support or equivalent.

The Display Console replaces the conventional indicators and switches with displays, and diagnostics can be loaded under lightpen control from one of the console files.

PREREQUISITES: Each AP system requires (1) a 3158-3 A series processing unit ... (2) a 3052 APU mdl 1 ... (3) a 3056 Remote System Console mdl 1. Identical MP CPU models are not required for a multiprocessor system. 3158 and 3158-3 models may be intermixed. However, when mixtures occur asymmetric MP storage is not an option. In addition, alternate CPU power down does not function. Asymmetric MP storage configuration options are available in the 3158-3 models with 1, 2, 3 or 4 megabytes of storage in each processor. The 3058 Multisystem Unit is required for each one or two processor MP system.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Console Table (Reading Board) Extension: #9824 for extension to operator's right, or #9825 for extension to left.

[4] Cabling: #9080 for below the floor, or #9081 for on the floor.

[5] Emergency Power-Off Control: May be required ... see "Special Features" and *S/370 Installation Manual - Physical Planning*. If two processors are installed and the 3052 is to be added and emergency power off ability is required on the systems, then the expanded Emergency Power Off Control (#3622) should be ordered.

[6] Minimum Configuration: See "Minimum Configurations" in "Systems" for minimum I/O units required in a S/370 mdl 158.

[7] RETAIN/370: Provided by integrated data adapter which is standard on the console. Customers must provide interface to telephone line.

[8] CPU Position: #9441 for left CPU in MP configuration, or #9442 for right.

[9] Remote MP Processor: Asymmetric MP storage provides asymmetric multiprocessor storage on the 3158-3 with the use of the appropriate optional specify feature to specify the model of the remote processor. The 3158-3 multiprocessor may have asymmetric model combinations of M32, M34, M35 and M36. With this feature, symmetric model combinations are standard. For asymmetric combinations specify: Remote Processor #9001 for 1 megabyte ... #9002 for 2 megabytes ... #9003 for 3 megabytes ... #9004 for 4 megabytes ... #9005 for 5 megabytes ... #9006 for 6 megabytes. **Field Installation:** Yes.

[10] Processor Attach Feature: When one processor is combined with another in a multiprocessor system, each processor must contain sufficient Storage Protect capability for the total storage in the system. Therefore, each processor must add additional Storage Protect capability to reflect the storage in the remote processor. The first megabyte of Storage Protect for the remote processor is included in the M31 and M32 Processors. One Processor Attach feature is required in an MP processor for each additional megabyte, beyond the first megabyte in the remote processor. See "Special Features."

PRICES:	Mdl	MAC/ MRC	TLP/ MLC	Purchase	MMMC
			4 Year		
3158	U31	\$42,280	\$38,440	\$1,381,100	\$2,360
	U32	43,800	39,825	1,418,600	2,430
	U33	45,320	41,210	1,456,100	2,500
	U34	46,840	42,595	1,493,600	2,570
	U35	50,400	45,835	1,583,600	2,780
	U36	53,440	48,605	1,658,600	2,920
	U37	56,480	51,375	1,733,600	3,060
	U38	59,520	54,145	1,808,600	3,200
	A31	43,910	39,920	1,430,100	2,760
	A32	45,430	41,305	1,467,600	2,830
	A33	46,950	42,690	1,505,100	2,900
	A34	48,470	44,075	1,542,600	2,970
	A35	52,030	47,315	1,632,600	3,180
	A36	55,070	50,085	1,707,600	3,320
	A37	58,110	52,855	1,782,600	3,460
	A38	61,150	55,625	1,857,600	3,600



3158-3 Processing Unit (cont'd)

M31	45,900	41,730	1,509,100	2,430
M32	47,420	43,115	1,546,600	2,500
M33	48,940	44,500	1,584,100	2,570
M34	50,460	45,885	1,621,600	2,640
M35	54,020	49,125	1,711,600	2,850
M36	57,060	51,895	1,786,600	2,990
M37	60,100	54,665	1,861,600	3,130
M38	63,140	57,435	1,936,600	3,270

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Base Unit Machine Group: D
 Per Call: 3 Purchase Option: 55%† Warranty: A
 Useful Life Category: 2 Termination Charge Months: 6
 Termination Charge Percent: 25% Upper Limit Percent: 5%
 Model/Feature Additional Charge in lieu of AU Charge: 15%

Model Changes: Field Installable.

3158 to 3158-3 Model CONVERSION Purchase Prices

3158 to 3158-U3	\$85,900 (No change in storage size)
3158-AP to 3158-A3	\$85,900 (No change in storage size)
3158-MP to 3158-M3	\$85,900 (No change in storage size)

3158-3 to 3158-3 Model CONVERSION Purchase Prices

3158-U3 to 3158-M3	\$128,000 (No change in storage size)
3158-U3 to 3158-A3	\$ 49,000 (No change in storage size)
3158-A3 to 3158-M3	\$ 79,000 (No change in storage size)

3158-3 to 3158-3 Model UPGRADE Purchase Prices

From To U32	U33	U34	U35	U36	U37	U38
U31	\$37,500					
U32		\$37,500				
U33			\$37,500			
U34				\$90,000		
U35					\$75,000	
U36						\$75,000
U37						\$75,000

From To M32	M33	M34	M35	M36	M37	M38
M31	\$37,500					
M32		\$37,500				
M33			\$37,500			
M34				\$90,000		
M35					\$75,000	
M36						\$75,000
M37						\$75,000

From To A32	A33	A34	A35	A36	A37	A38
A31	\$37,500					
A32		\$37,500				
A33			\$37,500			
A34				\$90,000		
A35					\$75,000	
A36						\$75,000
A37						\$75,000

NOTES:

- There are no additional installation charges over the above model conversion and model upgrade prices.
- The above model conversion and model upgrades are field installable.
- Planning for Model Conversions and Model Upgrades: When a customer requires storage upgrades in addition to a model conversion, the changes must not be consolidated into a single Also, storage upgrades for storage above two megabytes should be ordered in one megabyte increments.
- When an MP storage upgrade is submitted, the proper number of Processor Attach features (#5552) in the remote processor should be ordered.
- When an AP storage upgrade is submitted, the proper number of Processor Attach features (#5552) for the 3052 APU should be ordered.
- Field change from 3158-3 to 3158 is not recommended.
- When an upgrade to an MP System is submitted, the proper number of Processor Attach features (#5552) for the remote processor must be ordered.
- 3158-3 units with System/370 Extended (#7730) that are converted to an AP model require System/370 Extended, Add'l (#7731) on the AP model processing unit.
- 3158-3 units with System/370 Extended (#7730) that are converted to an MP model require System/370 Extended

(#7730) and System/370 Extended, Add'l (#7731) on both processing units.

SPECIAL FEATURES

BLOCK MULTIPLEXER CHANNEL (#1433-1435). Each adds a channel for attachment of I/O devices ... for devices that can be attached see S/370 in "Systems." The channel permits overlapped I/O operation with processing. Eight control unit positions are provided on each channel. Channel Indirect Addressing is included in each channel. #1433 -- for third block multiplexer channel ... #1434 -- for fourth ... #1435 -- for fifth. **Limitation:** #1434 cannot be installed if 2nd Byte Multiplexer Channel (#4990) is installed. **Field Installation:** Yes. **Prerequisites:** #1434 requires #1433 ... #1435 requires #1434 or #4990.

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (either S/360, S/370 or 4341 Processor). Only one of the processors requires this feature. Uses one control unit position on each of the connected channels. Function can be expanded under program control so that the adapter will operate as a standard control unit. **Maximum:** One. **Field Installation:** Yes.

ISC CONTROL STORE EXTENSION (#2150). Provides additional control store for microprogram use on the ISC (#4650). When the Staging Adapter for ISC (#7220) in NOT ordered, see "Specify" under Integrated Storage Controls (#4650) to determine when required. **NOTE:** When #7220 IS ordered, #2150 is prerequisite. **Maximum:** One. **Field Installation:** Yes.

EXPANDED CONTROL STORE (#2151). Provides additional control storage for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (#4650) to determine when required. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ISC Control Store Extension (#2150) and Register Expansion (#6111).

ISC/SA CONTROL STORE ADDITIONAL (#2152). Provides additional control store for microprogram use on the ISC (#4650).. Required if 3350 DASD is attached to an ISC/SA (#7220). **Maximum:** One **Field Installation:** Yes. **Prerequisite:** Register Expansion (#6111), Expanded Control Store (#2151), and Staging Adapter for ISC (#7220).

DIRECT CONTROL (#3274). Provides two instructions, "Read Direct" and "Write Direct," and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes, between two cable-connected processing units, or a cable-connected processing unit and external devices. **Maximum:** One. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisites:** External devices must meet the interface specifications outlined in S/370-Direct Control Feature-OEM, GA22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide, in effect, a single emergency power-off switch in a "room" or "area" ... see Emergency Power-Off under S/370 in "Systems." #3621 -- to interconnect two emergency power-off switches ... #3622 -- to interconnect up to twelve emergency power-off switches. **Field Installation:** Yes.

EMERGENCY POWER-OFF PANEL EXPANSION (#3625). The basic S/370 mdl 158 provides for EPO control for up to 16 control units. When single mdl 158 configurations exceed this limit, #3625 should be ordered. Each #3625 attaches up to four additional EPO terminations. **Maximum:** Five. Where assistance is needed in determining requirements, consult Installation Planning Representatives. **Field Installation:** Yes.

EXTENDED PRECISION FLOATING POINT (#3700). Provides instructions to handle extended precision (28-hexadecimal digit fraction) floating point operands. Extended precision operands may also be rounded to long-precision format, which in turn may be rounded to short-precision format. This function is also included in and enabled by the OS/VS1 ECPS (Extended Control Program Support) (#8750). **Field Installation:** Yes.

1401/1440/1460, 1410/7010 COMPATIBILITY (#3950). Provides the system with the ability to execute 1401/1440/1460 and 1410/7010 instructions under specific conditions of minimum and matching configurations ... see P 360N pages for DOS and P 360C pages for OS. **Field Installation:** Yes. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730), System/370 Extended, Add'l (#7731), or with OS/VS1 ECPS (Extended Control Program Support)(#8750).

INTEGRATED STORAGE CONTROLS (ISC) (#4650). Provides for the attachment of 3333s (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdl A2s/A2Fs when Staging Adapter for ISC (#7220) is NOT ordered. Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl Bs and/or 3344s to the 3340 mdl A2, or by attaching 3350 mdl Bs

† Purchase Option is 50% under Term Lease Plan (TLP)



3158-3 Processing Unit (cont'd)

IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#3950), OS/DOS Compatibility (#5450), 7070/7074 Compatibility (#7117), Virtual Machine Assist (#8740), or with OS/VS1 ECPS (Extended Control Program Support)(#8750).

SYSTEM/370 EXTENDED, ADD'L (#7731). Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. **Field Installation:** Yes. **Prerequisites:** Required, together with System/370 Extended (#7730), on each processor in an MP system, and on the A-series processor in an AP system. System/370 Extended (#7730) is also required on the 3052 Attached Processing Unit in an AP system. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#3950), OS/DOS Compatibility (#5450), 7070/7074 Compatibility (#7117), Virtual Machine Assist (#8740), or with OS/VS1 ECPS (Extended Control Program Support)(#8750).

3056 REMOTE CONSOLE ATTACHMENT (#7820). Provides attachment to the Display Console of an optional console up to 150 feet away. **Maximum:** One. **Field Installation:** Yes.

3213 PRINTER ATTACHMENT (#7840). To attach a 3213 Printer to the Display Console for optional hard copy. **Maximum:** One. **Field Installation:** Yes.

TWO CHANNEL SWITCH FOR ISC (#7905). To provide each of the two paths of an ISC with the capability of attaching to a second channel. The channels may be on the same CPU or different CPUs. Switching is under program control. Each path of the ISC can be dedicated to a single channel by means of a Configuration Switch. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** An available control unit position and eight unshared subchannels on a system block multiplexer channel. For S/360 mdl 195 and S/370 mdls 165, 168, 195, see 2880 Block Multiplexer Channel. For S/370 mdls 135, 135-3, 138, 145, 145-3, 148, 155, 158, and 3031, 3032 or 3033 Processor, see 3135, 3135-3, 3138, 3145, 3145-3, 3148 3155, 3158, 3031, 3032, 3033 respectively. For 4300 Processors, see 4341.

VIRTUAL MACHINE ASSIST (#8740). Provides assist to VS operating systems operating under VM/370 by emulation of certain privileged operations. This function is also included in and enabled by the OS/VS1 ECPS (Extended Control Program Support) (#8750). **Field Installation:** Yes. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with 7070/7074 Compatibility (#7117), System/370 Extended (#7730), or with System/370 Extended, Add'l (#7731).

OS/VS1 ECPS (EXTENDED CONTROL PROGRAM SUPPORT) (#8750). Provides assist to OS/VS1 by emulation of certain supervisor functions. This feature also includes and enables Virtual Machine Assist and Extended Precision Floating Point functions. **Prerequisite:** Feature must be selected at system generation on OS/VS1 Release 6 or subsequent releases. **Limitations:** This feature cannot be loaded, at IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#3950), OS/DOS Compatibility (#5450), 7070/7074 Compatibility (#7117), System/370 Extended (#7730), System/370 Extended, Add'l (#7731), or in Multiprocessing Mode. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	TLP/ MLC		Purch	MMMM
		4 Year			
Block Multiplexer Channel					
- 3rd	#1433	\$ 463	\$ 421	\$16,160	\$14.00
- 4th	1434	432	393	15,040	11.00
- 5th	1435	215	196	7,565	5.00
Channel-to-channel Adapter	1850	432	393	15,040	9.00
ISC Control Store Extens	2150†	526	478	21,060	23.00
Expanded Control Store	2151*†	318	289	12,720	23.00
ISC/SA Control Store Add'l	2152†	318	289	12,720	23.00
Direct Control	3274	123	112	3,705	4.00
Emergency Power-Off Control					
for 2 switches	3621	NC	NC	NC	NC
for up to twelve switches	3622	NC	NC	NC	NC
Emerg Power-Off Panel Exp	3625	NC	NC	NC	NC
Extnd Precision Floating Pt	3700	NC	NC	NC	NC
1401/1440/1460, 1410/7010					
Compatibility	3950	NC	NC	NC	NC
Integrated Storage Controls	4650†	1,920	1,745	77,600	258.00
2nd Byte Multiplexr Channl	4990	463	421	16,160	14.00
OS/DOS Compatibility	5450	NC	NC	NC	NC
Processor Attach	5552	90	82	2,700	15.00
Power Warning	5760	142	130	5,725	1.00
Register Expansion	6111	47	43	1,330	8.50
Remote Switch Attachment	6148	NC	NC	NC	NC
7070/7074 Compatibility	7117	NC	NC	NC	NC
Staging Adapter for ISC	7220*†	2,065	1,875	83,200	245.00
System/370 Extended	7730	715	650	13,000	4.00
System/370 Extd, Add'l	7731	220	200	4,000	2.00
3056 Remote Cnsl Attach	7820	51	47	2,545	4.00
3213 Printer Attachment	7840	114	104	5,545	1.00
Two Channel Sw for ISC	7905	351	319	14,220	23.00
Virtual Machine Assist	8740	NC	NC	NC	NC
OS/VS1 Extended Control					
Program Support	8750	NC	NC	NC	NC

* Customer price quotations and order acknowledgement letters for purchase must state: "Installation of this feature involves removal of parts which become the property of IBM."

† Feature supplies ISC diskette.

IBM 3165 PROCESSING UNIT

[The 3165 is no longer available ... features and model changes can be ordered on an "as available" basis.]

Purpose: Provides arithmetic, logic and control functions for a S/370 mdl 165.

Model I	Used with two 3360 mdl 4s in a S/370 mdl I165 (524,288 bytes).
Model J	Used with two 3360 mdl 5s in a S/370 mdl J165 (1,048,576 bytes).
Model JI	Used with two 3360 mdl 4s and two 3360 mdl 5s in a S/370 mdl JI165 (1,572,864 bytes).
Model K	Used with four 3360 mdl 5s in a S/370 mdl K165 (2,097,152 bytes).
Model KJ	Used with six 3360 mdl 5s in a S/370 mdl KJ165 (3,145,728 bytes).

Highlights: Depending upon the model, can attach up to 3,145,728 bytes of 2-microsecond processor storage ... eight byte parallel data flow ... includes up to 16,384 bytes of 80-nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective cycle time of storage ... buffer storage does not increase the amount of addressable storage ... 80-nanosecond processor cycle ... double words are four-way interleaved ... overlapped operation of instruction and execution units ... extensive data checking is coupled with increased reliability, availability and serviceability.

Standard Features -- universal instruction set ... extended precision floating point feature ... one-microsecond time-of-day clock ... additional variable field length instructions ... control registers, expanding the functions of PSWs ... byte-oriented operand feature ... buffer storage (8,192 bytes) ... fetch and store protection ... direct control feature ... attachment for 2860 Selector Channels, 2870 Multiplexer Channel(s) and 2880 Block Multiplexer Channel(s) ... storage configuration control ... writable control storage ... interval timer ... storage error checking and correction ... instruction retry.

Channels -- separate channels facilitate maximum overlap with processing. Channel speeds of 1.5 million bytes/second are standard and up to 3 million bytes/second with Two Byte Interface (#7850, 7851) on the 2880 Block Multiplexer Channel. Up to seven logical channels can be attached per CPU. Valid combinations include: (a) One 2870 plus up to six channels of 2860s and 2880s ... (b) Two 2870s plus up to five channels of 2860s and 2880s ... (c) If no 2870 is attached, only up to six channels, 2860s and/or 2880s, can be attached per CPU. See 2860, 2870 and 2880.

With the addition of Extended Channels (#3850), up to twelve channels can be attached ... for valid combinations, see "Special Features." Depending upon data rates, all channels, including the Selector Subchannels and basic multiplexer channel of the 2870 can operate concurrently. Each selector or block multiplexer channel can control up to eight control units. The basic multiplexer channel and each Selector Subchannel of the 2870 controls up to eight control units. If one 2841 is attached, no other control unit can be attached to that Selector Subchannel ... see 2841.

Limitations: High performance devices can be accommodated by the 3165 only by adhering to the following requirements and limitations:

Storage Control	Channel Type	Channel Priority
2835 mdl 1	2880	1
2835 mdl 2	2880	1 or 2
2820	2880 or 2860	1 or 2

When attaching 2835s and 2820s, the control units must be attached to channels contained in the channel frames located in the first or second position of the channel bus.

The maximum number of 3330 facilities is determined by the total system configuration ... consult your SD and I Center.

PREREQUISITES: In addition to appropriate 3360 Processor Storages, each 3165 requires: [1] At least one selector channel (2860), block multiplexer channel (2880), or a 2870 with at least one Selector Subchannel ... [2] One 3066 System Console mdl 1 ... [3] One 3067 Power and Coolant Distribution Unit mdl 1 ... [4] A motor generator set.

Customer-supplied chilled water is required for cooling the system ... see S/370 Installation Manual - Physical Planning, GC22-7004.

Each model of the 3165 has been designed for interconnected operation with a specified number of 3360 Processor Storage Units. Customers who wish to order the 3165 for use without the specified number of 3360s should submit an RPQ to provide the

necessary safety elements (covers, cable connectors, etc.) and the changes required for quality testing and installing.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Motor Generator Set and Starter: See M 10000 pages for ordering instructions and prices.

[3] Channel Attachment: The basic 3165 has connection facilities for channels addressed 0, 1 and 2. **SPECIFY:** #9065 for attachment of channels addressed 3 and 4 ... #9066 for channels addressed 5 and 6. #9065 is a prerequisite for #9066. For channels 7 - 11, see Extended Channels (#3850). Customers who may elect to purchase and have present or future requirements for channels addressed 5 and 6 should specify #9066.

[4] Emergency Power-Off Control: May be required ... see "Special Features" and S/370 Installation Manual - Physical Planning, GC22-7004, for details.

[5] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[6] RETAIN/370: #9570 for non-use of FE DAU, #9571 for first CPU using FE DAU, #9572 for second CPU using FE DAU, or #9573 for third CPU using FE DAU. Customer must provide interface for FE DAU to the telephone line.

PRICES:	MDL	MAC/ MRC	Purchase	MMM
3165	I	\$ 37,790	\$1,814,600	\$2,790
	J	37,900	1,819,900	2,800
	JI	38,370	1,841,900	2,835
	K	38,680	1,858,200	2,885
	KJ	39,820	1,913,100	2,980

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3066) Machine Group: D
Purchase Option: 55% Useful Life Category: 1 Per Call: 3
Warranty: A

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	J	JI	K	KJ
I	\$5,300	\$27,300	\$43,600	\$98,500
J		22,000	38,300	93,200
JI			16,300	71,200
K				54,900

The model conversion prices above are applicable only when the 3165 is used with the combinations of 3360 Processor Storages as indicated under "Models" above.

SPECIAL FEATURES

BUFFER EXPANSION (#1432). Expands the basic 8,192-byte buffer to 16,384 bytes. **Field Installation:** Yes. **Prerequisite:** Buffer Expansion (#1432) on the 3067 Power and Coolant Distribution Unit mdl 1.

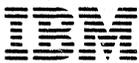
EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide, in effect, a single Emergency Power-Off Switch in a "room" or "area" ... see "Emergency Power-Off" in "Systems" and SRL GC22-7004 for details. #3621 -- to interconnect 2 emergency power-off switches ... #3622 -- to interconnect up to 12 emergency power-off switches. **Field Installation:** Yes.

EXTENDED CHANNELS (#3850). To attach up to twelve channels, in combinations of 2860 Selector Channels, 2870 Multiplexer Channels, and 2880 Block Multiplexer Channels. A maximum of twelve channels or a total of seven channel frames, whichever occurs first, can be attached. The feature includes the capability of addressing channels 7 thru 11. Valid maximum channels attachable are:

2860s -- maximum 6 channels
2870s -- maximum 2 channels
2880s -- maximum 11 channels

Limitations: The 2860 channel addresses must be numbered one thru six. The first 2870 channel must be numbered zero ... the second 2870 must be numbered one thru six. The 2880 channel addresses may be any number one thru eleven. If the address of the 2880 is seven thru eleven, only 2301s, 2303s, 2305s, 2311s, 2314s, 2321s, 2420s, 3211s, 3330s, 3420s or 3505s may be attached. **Field Installation:** Yes. **Prerequisite:** #9066 ... see "Specify" above. The number of channel frames specified on the power distribution unit must be equal to or greater than the channel frames actually attached. See 3067 mdl 1.

† NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.



3165 Processing Unit (cont'd)

HIGH SPEED MULTIPLY (#4520). Improves processor speed in both fixed and floating point multiply operations. **Field Installation:** Not recommended. **Prerequisites:** High Speed Multiply (#4520) on the 3066 System Console mdl 1 and on the 3067 Power and Coolant Distribution Unit mdl 1.

7070/7074 COMPATIBILITY (#7117). Provides the system with the ability to execute 7070 and 7074 instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. 7070/7074 system features included are: Channels, 729 magnetic tape, 7501 Console Card Reader, and Floating Decimal Arithmetic. NOT included are: Teleprocessing equipment, disk storage, punched card I/O, printer, Hypertape, Interval Timer, and core storage addresses above 9989. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." **Limitation:** Cannot be installed with any other compatibility feature. **Field Installation:** Not recommended. **Prerequisite:** 7070/7074 Compatibility (#7117) on the 3066 System Console mdl 1 and on the 3067 Power and Coolant Distribution Unit mdl 1.

7080 COMPATIBILITY (#7118). Provides the system with the ability to execute 705 and 7080 instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. 7080 system features included are: Channels, punched card input, typewriter, and 729 magnetic tape. NOT included are: Teleprocessing equipment, disk storage, Hypertape, and 705 units on-line with the 7080. Only the 7080 is emulated, but 705 programs can be run because the "705 mode" of the 7080 is emulated. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." **Limitation:** Cannot be installed with any other compatibility feature. **Field Installation:** Not recommended. **Prerequisite:** 7080 Compatibility (#7118) on the 3066 System Console mdl 1 and on the 3067 Power and Coolant Distribution Unit mdl 1.

709/7090/7094/7094 II COMPATIBILITY (#7119). Provides the system with the ability to execute 709, 7090, 7094, 7094 II instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. Included are the following features of those systems: Channels, punched card I/O, printer and 729 magnetic tape. NOT included are: Hypertape, teleprocessing equipment, direct couple, disk storages, drum storages, 1401 adapter, direct data on 7094 special and custom features. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." **Limitation:** Cannot be installed with any other compatibility feature. **Field Installation:** Not recommended. **Prerequisite:** 709/7090/7094/7094 II Compatibility (#7119) on the 3066 System Console mdl 1 and on the 3067 Power and Coolant Distribution Unit mdl 1.

Special Feature Prices:		MAC/ MRC	Purchase	MMMC
Buffer Expansion	#1432	\$1,610	\$ 77,160	\$ 52.00
Emergency Power-Off Control,				
for 2 switches	3621	NC	NC	NC
for up to 12 switches	3622	NC	NC	NC
Extended Channels	3850	513	24,640	66.00
High Speed Multiply	4520	2,815	135,150	104.00
7070/7074 Compatibility	7117	2,930	140,350	155.00
7080 Compatibility	7118	2,930	140,350	155.00
709/7090/7094/7094 II Cmpt	7119	2,930	140,350	155.00

DYNAMIC ADDRESS TRANSLATION (Purchased Models J, K and KJ)

Purchased installed model 165s may be field converted to 165-II through installation of the Dynamic Address Translation Facility.

Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of model change to the 'II' Model involves the removal of parts which become the property of IBM."



IBM 3168 PROCESSING UNIT

Purpose: Provides arithmetic, logic, processor storage and control functions for a S/370 mdl 168.

Models Bytes of Processor Storage

J	MP1	1,048,576
K	MP2	2,097,152
KJ	MP3	3,145,728
L	MP4	4,194,304
LJ	MP5	5,242,880
LK	MP6	6,291,456
LKJ	MP7	7,340,032
M	MP8	8,388,608

Highlights: Depending upon the model, can contain up to 8,388,-608 bytes of monolithic processor storage ... eight byte parallel data flow ... includes up to 16,384 bytes of 80 nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective cycle time of storage ... buffer storage does not increase the amount of addressable storage ... 80 nanosecond processor cycle ... double-words are four-way interleaved ... overlapped operation of instruction and execution units ... extensive data checking is coupled with increased reliability, availability and serviceability.

Standard Features: Universal instruction set ... extended precision ... one-microsecond time-of-day clock with clock comparator ... one-microsecond CPU timer ... dynamic address translation ... extended control mode ... program event recording ... dual channel I/O bus ... additional variable field length instructions ... control registers, expanding the functions of PSWs ... byte-oriented operand feature ... buffer storage (8,192 bytes) ... fetch and store protection ... direct control feature ... attachment for 2860 Selector Channel(s), 2870 Multiplexer Channel(s), and 2880 Block Multiplexer Channel(s) ... storage configuration control ... writable control storage ... interval timer ... storage error checking and correction ... instruction retry ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... clear I/O. Channel Reconfiguration Hardware and four additional instructions on the MP models: signal processor ... set prefix ... store prefix ... store CPU address.

Channels: Separate channels facilitate maximum overlap with processing. Channel speeds of 1.5 million bytes/second are standard and up to 3 million bytes/second with Two Byte Interface (#7850, 7851) on the 2880 Block Multiplexer Channel. Up to seven logical channels can be attached per CPU. Valid combinations include: (a) One 2870 plus up to six channels of 2860s and 2880s ... (b) Two 2870s plus up to five channels of 2860s and 2880s ... (c) If no 2870 is attached, only up to six channels, 2860s and/or 2880s, can be attached per CPU. See 2860, 2870, 2880.

With the addition of Extended Channels (#3855), up to twelve channels can be attached ... for valid combinations, see "Special Features." Depending upon data rates, all channels, including the Selector Subchannels and basic multiplexer channel of the 2870 can operate concurrently. Each selector or block multiplexer channel can control up to eight control units. The basic multiplexer channel and each Selector Subchannel of the 2870 controls up to eight control units. If one 2841 is attached, no other control unit can be attached to that Selector Subchannel ... see 2841.

PREREQUISITES: Each 3168 requires [1] At least one selector channel (2860), block multiplexer channel (2880), or a 2870 with at least one Selector Subchannel ... [2] One 3066 System Console mdl 2 ... [3] One 3067 Power and Coolant Distribution Unit mdl 2 ... [4] An appropriate 415Hz power input. Customer-supplied chilled water is required for cooling the system. See S/370 Installation Manual - Physical Planning, GC22-7004.

An MP system requires two MP CPU models of any size. Each MP CPU model requires Multiprocessing (#5050) on both the 3066 mdl 2 and the 3067 mdl 2. The 3068 Multisystem Communication Unit is required for each one or two processor MP system. If either of the processors is a mdl MP5, MP6, MP7 or MP8, Extended Storage Attachment (#3850) is required on the 3068.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Motor Generator Set and Starter: If desired, see M 10000 pages for ordering instructions and prices.

[3] Channel Attachment: The basic 3168 has connection facilities for channels addressed 0-6. For channels 7-11, see Extended Channels (#3855).

* Purchase Option is 50% under Term Lease Plan (TLP)

† NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.

[4] Emergency Power-Off Control: May be required ... see "Special Features" and S/370 Installation Manual - Physical Planning, GC22-7004 for details.

[5] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[6] RETAIN/370: Customer must provide interface for FE DAU to the telephone line.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Year	Purchase	MMMC
3168	J	\$ 61,620	\$ 56,020	\$2,094,500	\$5,070
	K	64,660	58,790	2,169,500	5,210
	KJ	67,700	61,560	2,244,500	5,350
	L	70,810	64,390	2,321,500	5,500
	LJ	74,370	67,630	2,411,500	5,710
	LK	77,410	70,400	2,486,500	5,850
	LKJ	80,450	73,170	2,561,500	5,990
	M	83,490	75,940	2,636,500	6,130
	MP1	63,470	57,700	2,158,100	5,080
	MP2	66,510	60,470	2,233,100	5,220
	MP3	69,550	63,240	2,308,100	5,360
	MP4	72,660	66,070	2,385,100	5,510
	MP5	76,220	69,310	2,475,100	5,720
	MP6	79,260	72,080	2,550,100	5,860
	MP7	82,300	74,850	2,625,100	6,000
	MP8	85,340	77,620	2,700,100	6,140

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3066-2) Machine Group: D
Per Call: 3 Purchase Option: 55%* Warranty: A
Useful Life Category: 1 Termination Charge Months: 6
Termination Charge Percent: 25% Upper Limit Percent: 5%
Model/Feature Additional Charge in lieu of AU Charge: 15%

Model Changes: Field Installable.

3168 to 3168 Model CONVERSION Purchase Prices

3168 to 3168 MP \$63,600 (no change in storage size)

3168 to 3168 Model UPGRADE Purchase Prices

From To	K	KJ	L	LJ	LK	LKJ	M
J	\$75,000						
K		\$75,000					
KJ			\$77,000				
L				\$90,000			
LJ					\$75,000		
LK						\$75,000	
LKJ							\$75,000

From To	MP2	MP3	MP4	MP5	MP6	MP7	MP8
MPI	\$75,000						
MP2		\$75,000					
MP3			\$77,000				
MP4				\$90,000			
MP5					\$75,000		
MP6						\$75,000	
MP7							\$75,000

NOTES:

- There are no additional installation charges over the above model conversion and model upgrade prices.
- The above model conversion and model upgrades are field installable.
- Planning for Model Conversions and Model Upgrades: When a customer requires model (storage) upgrades in addition to a model conversion, the changes must not be consolidated into a single Also, model (storage) upgrades should be ordered individually in one-model increments.

SPECIAL FEATURES

BUFFER EXPANSION (#1435). Expands the basic 8,192-byte buffer to 16,384 bytes. **Field Installation:** Yes. **Prerequisite:** Buffer Expansion (#1435) on the 3067 Power and Coolant Distribution Unit mdl 2.

ISC CONTROL STORE EXTENSION (#2150). Provides additional control store for microprogram use on the ISC (#4650). When the Staging Adapter for ISC (#7220) is NOT ordered, see "Specify" under Integrated Storage Controls (#4650) to determine when required. **Note:** When #7220 IS ordered, #2150 is prerequisite. **Maximum:** One. **Field Installation:** Yes.

EXPANDED CONTROL STORE (#2151). Provides additional control store for microprogram use on the ISC. See "Specify" under Integrated Storage Control (#4650) to determine when required. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ISC Control Store Extension (#2150) and Register Expansion (#6111).

ISC/SA CONTROL STORE ADDITIONAL (#2152). Provides additional control store for microprogram use on the ISC (#4650). Required if 3350 DASD is attached with Staging Adapter for ISC



3168 Processing Unit (cont'd)

(#7220). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Register Expansion (#6111), Expanded Control Store (#2151), and Staging Adapter for ISC (#7220).

EMERGENCY POWER-OFF CONTROL (#3623, 3624). To provide, in effect, a single Emergency Power-Off Switch in a "room" or "area" ... see "Emergency Power-Off" in "Systems" and SRL GC22-7004 for details. #3623 -- to interconnect 2 Emergency Power-Off Switches ... #3624 -- to interconnect up to 12 Emergency Power-Off Switches. **Field Installation:** Yes.

EXTENDED CHANNELS (#3855). To attach up to twelve channels, in combinations of 2860 Selector Channels, 2870 Multiplexer Channels and 2880 Block Multiplexer Channels. A maximum of twelve channels, or a total of seven channel frames, whichever occurs first, can be attached. The feature includes the capability of addressing channels 7 thru 11. Valid maximum channels attachable are:

- 2860s -- maximum 6 channels
- 2870s -- maximum 2 channels
- 2880s -- maximum 11 channels.

Limitations: 2860 channel addresses must be numbered one thru six. The first 2870 must be numbered zero. The second 2870 must be numbered one thru six. The 2880 channel addresses may be any number one thru eleven. If the address of the 2880 is seven thru eleven, only 2301s, 2303s, 2305s, 2311s, 2314s, 2321s, 2420s, 3211s, 3330s, 3340s, 3350s, 3420s, 3505s or 3705s may be attached. **Field Installation:** Yes.

HIGH SPEED MULTIPLY (#4525). Improves processor speed in both fixed and floating point multiply operations. **Field Installation:** Not recommended. **Prerequisites:** High Speed Multiply (#4525) on the 3066 System Console mdl 2 and on the 3067 Power and Coolant Distribution Unit mdl 2.

INTEGRATED STORAGE CONTROLS (ISC) (#4650). Provides for the attachment of 3333s (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdl A2s/A2Fs when Staging Adapter for ISC (#7220) is NOT ordered. Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl Bs and/or 3344s to the 3340 mdl A2, or by attaching 3350 mdl Bs and/or a mdl C to the 3350 mdl A2/A2F ... see DASD Configuration table below and 3333, 3330, 3340, 3350 "Machines" pages. The ISC is organized functionally into two separate paths with up to 16 drives per path ... up to 32 drives per path when ISC Control Store Extension (#2150) is installed. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Each ISC path requires a control unit position on a block multiplexer channel. **Specify:** The following applies only when Staging Adapter for ISC (#7220) is NOT ordered:

The available combinations of storage devices that can be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required DASD Specify Features" are installed. Based on the DASD, and the Special Features listed below being ordered for them, order the Required DASD Specify Feature(s). **NOTE:** The selected "Required DASD Specify Feature(s)" applies to both ISC paths. Within this constraint the DASD Configuration on one ISC path may be different from that on the other ISC path.

ISC (#4650) WITH ONE CHANNEL OR WITH TWO CHANNEL SWITCH (#7905)

DASD CONFIGURATION	Required DASD Specify Features *						
	9313 †	9314 †	9314† 9190†	9315 †	9315† 9190†	9317 †	9318 †
3333 Only One or two 3333s with associated 3330s Up to four 3333s with associated 3330s String Switch #8150 on any 3333	x	x		x			
3340 Only One or two 3340 mdl A2s with associated mdl B1/B2s Up to four 3340 mdl A2s with associated mdl B1/B2s String Switch #8150 on any 3340 mdl A2 Fixed Head Feature #4301/4302 on any 3340		x	x		x		
3340/3344 Up to four 3340 mdl A2s of which up to two may attach 3344s String Switch #8150 on any 3340 mdl A2 and/or Fixed Head Feature #4301/4302 on any 3340						x	x
3333/3340 (not 3344) 3333s and 3340 mdl A2s (any combination of two, three or four) each with associated drives String Switch #8150 on any 3333 or 3340 mdl A2 Fixed Head Feature #4301/4302 on any 3340				x	x		
3350 Only Up to four 3350 mdl A2s/A2Fs w associated mdl B2s/B2Fs; C2s/C2Fs String Switch #8150 on any 3350 mdl A2/A2F; C2/C2F							x
3333/3340/3350 (not 3344) 3333s, 3340 mdl A2s and 3350 mdl A2s/A2Fs (any combination of 2, 3 or 4) with associated drives String Switch #8150 on any 3333, 3340 mdl A2, or 3350 mdl A2/A2F; C2/C2F and/or Fixed Head Feature #4301/4302 on any 3340							x

- † ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.
- * Any change to an installed DASD Configuration requires a MES ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.
- ** ISC Control Store Extension (#2150) is prerequisite. With #9315, each path of the ISC requires 32 contiguous device addresses regardless of the number of drives attached.
- + Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the 3830-2 uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 mdl A2s on the first and third strings may attach up to three 3340 mdl B1, B2s, and/or 3344s in any combination. The 3340 mdl A2 on the second string may attach up to three 3340 mdl B1/B2s. The 3340 mdl A2 on the fourth string may attach one 3340 mdl B1 or B2.
- ++ Expanded Control Store (#2151), Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group each ISC path uses 8 or 16 or 32 or 64 device addresses depending upon the respective DASD configuration installed and whether any 3350 drive is in 3330-1 compatibility mode.

REGISTER EXPANSION (#6111). Provides additional registers for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (#4650) to determine when required. **Field Installation:** Yes. **Maximum:** One.

REMOTE SWITCH ATTACHMENT (#6148). To attach the Two Channel Switch for ISC (#7905) to the configuration control panel on the 3068 Multisystem Communication Unit. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Two Channel Switch for ISC (#7905).

7070/7074 COMPATIBILITY (#7127). Provides the system with the ability to execute 7070 and 7074 instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. 7070/7074 system features included are: Channels, 729 magnetic tape, 7501 Console



3168 Processing Unit (cont'd)

Card Reader, and Floating Point Decimal Arithmetic. NOT included are: Teleprocessing equipment, disk storage, punched card I/O, printer, Hypertape, Interval Timer, and core storage addresses above 9989. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." **Limitations:** Cannot be installed with any other compatibility feature. Cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730). **Field Installation:** Not recommended. **Prerequisites:** 7070/7074 Compatibility (#7127) on the 3066 System Console mdl 2 and on the 3067 Power and Coolant Distribution Unit mdl 2.

7080 COMPATIBILITY (#7128). Provides the system with the ability to execute 705 and 7080 instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. 7080 system features included are: Channels, punched card input, typewriter, and 729 magnetic tape. NOT included are: Teleprocessing equipment, disk storage, Hypertape, and 705 units on-line with the 7080. Only the 7080 is emulated, but 705 programs can be run because the "705 mode" of the 7080 is emulated. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." **Limitations:** Cannot be installed with any other compatibility feature. Cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730). **Field Installation:** Not recommended. **Prerequisites:** 7080 Compatibility (#7128) on the 3066 System Console mdl 2 and on the 3067 Power and Coolant Distribution Unit mdl 2.

709/7090/7094/7094 II COMPATIBILITY (#7129). Provides the system with the ability to execute 709, 7090, 7094 and 7094 II instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. Included are the following features of those systems: Channels, punched card I/O, printer, and 729 magnetic tape. NOT included are: Hypertape, teleprocessing equipment, direct couple, disk storages, drum storages, 1401 adapter, direct data on 7094 special and custom systems. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." **Limitations:** Cannot be installed with any other compatibility feature. Cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730). **Field Installation:** Not recommended. **Prerequisites:** 709/7090/7094/7094 II Compatibility (#7129) on the 3066 System Console mdl 2 and on the 3067 Power and Coolant Distribution Unit mdl 2.

STAGING ADAPTER FOR ISC (#7220). Enables each path of the ISC to attach a maximum of four 3333 Mdl 1 and 11 and/or 3350 Mdl A2/A2F's with associated 3330 Mdl 1, 2 and 11 and 3350 Mdl B2/B2F and C2/C2F, for a maximum of 32 drives per path. See 3333, 3330 and 3350 for additional information. Also see note on M3333 pages for feature changes required when 3333's are retained for use with a 3851. Provides up to 64 virtual 3330 addresses for each channel interface on each path of the ISC. Provides for the attachment of up to four Data Recording Controls in one or two 3851 Mass Storage Facilities to each path of the ISC. **Maximum:** One. **Field Installation:** Yes ... must include removal of any of the following which are installed: #9190, 9313, 9314, 9315, 9317, 9318. **Prerequisites:** Integrated Storage Controls (#4650) and ISC Control Store Extension (#2150). For 3350 attachment the additional prerequisites are Expanded Control Store (#2151), Register Expansion (#6111) and ISC/SA Control Store Additional (#2152). **Limitations:** If String Switch (#8150) is installed on a 3333, see writeup for this feature on 3333 "Machines" page. 3340 drives cannot be attached to the ISC when #7220 is installed. 3350 drives attached to the ISC when #7220 is installed cannot be used as staging drives and must be designated as real in 3350 native mode only. 3350 devices may not be mixed with other type devices in the same string. **Specify:** #9319 (Staging Adapter 3333/3330/3350).

SYSTEM/370 EXTENDED (#7730). Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. **Field Installation:** Yes. **Prerequisites:** RPQ Performance Improvements. RPQ APU Attach, is also required if the 3168 is used with a 3062. Required on each processor in an MP system and on a 3168 with RPQs System/370 Extended (#7730) is also required on the 3062 Attached Processing Unit in an AP system. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with 7070/7074 Compatibility (#7127), 7080 Compatibility (#7128), or 709/7090/7094/7094 II Compatibility (#7129).

TWO CHANNEL SWITCH FOR ISC (#7905). To provide each of the two paths of an ISC with the capability of attaching to a second channel. The channels may be on the same CPU or different CPUs. Switching is under program control. Each path of the ISC can be dedicated to a single channel by means of a Configuration Switch. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** An available control unit position and eight unshared subchannels on a system block multiplexer channel. For S/370 mdl 165, 168, 195, see 2880 Block Multiplexer Channel. For S/370 mdl 135, 135-3, 138, 145, 145-3, 148, 155, 158, 3031, 3032 and 3033,

see 3135, 3135-3, 3138, 3145, 3145-3, 3148 3155, 3158, 3031, 3032 or 3033 respectively. For 4300 Processors, see 4341.

Special Feature Prices:		TLP			
		MAC/ MRC	MLC 4 Yr	Purch	MMMC
Buffer Expansion	#1435	\$1,740	\$1,585	\$83,340	\$65.50
ISC Control Store Extn	2150*	526	478	21,060	23.00
Expanded Control Store	2151*	318	289	12,720	23.00
ISC/SA Cntrl Store Add'l	2152*	318	289	12,720	23.00
Emergency Power-Off Control					
for 2 switches	3623	NC	NC	NC	NC
for up to 12 switches	3624	NC	NC	NC	NC
Extended Channels	3855	554	504	26,610	83.00
High Speed Multiply	4525	3,035	2,760	145,950	131.00
Integrated Storage Cntrls	4650*	1,920	1,745	77,600	258.00
Register Expansion	6111	47	43	1,280	8.00
Remote Switch Attach	6148	NC	NC	NC	NC
7070/7074 Compatibility	7127	3,160	2,875	151,600	197.00
7080 Compatibility	7128	3,160	2,875	151,600	197.00
709/7090/7094/7094 II					
Compatibility	7129	3,160	2,875	151,600	197.00
Staging Adapter for ISC	7220†*	2,065	1,875	83,200	245.00
System/370 Extended	7730	3,575	3,250	65,000	50.00
Two Chnl Switch for ISC	7905	351	319	14,220	23.00

† Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this feature involves the removal of parts which become the property of IBM."

* Feature supplies ISC diskette.

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IBM 3168-3 PROCESSING UNIT

Purpose: Provides arithmetic, logic, processor storage and control functions for a S/370 mdl 168.

Models			Bytes of Processor Storage
U31	M31	A31	1,048,576
U32	M32	A32	2,097,152
U33	M33	A33	3,145,728
U34	M34	A34	4,194,304
U35	M35	A35	5,242,880
U36	M36	A36	6,291,456
U37	M37	A37	7,340,032
U38	M38	A38	8,388,608

Highlights: Depending upon the model, can contain up to 8,388,608 bytes of monolithic processor storage ... eight byte parallel data flow ... includes up to 32,768 bytes of 80 nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective cycle time of storage ... buffer storage does not increase the amount of addressable storage ... 80 nanosecond processor cycle ... double-words are four-way interleaved ... overlapped operation of instruction and execution units ... extensive data checking is coupled with increased reliability, availability and serviceability. Improved instruction execution times over the 3168. Improved interrupt execution times over the 3168. Improved availability and serviceability through a service processor. Attached Processing by attachment of a 3062 Attached Processing Unit mdl 1.

Standard Features: Universal instruction set ... extended precision ... one-microsecond time-of-day clock with clock comparator ... one-microsecond CPU timer ... dynamic address translation ... extended control mode ... program event recording ... dual channel I/O bus ... additional variable field length instructions ... control registers, expanding the functions of PSWs ... byte-oriented operand feature ... buffer storage (32,768 bytes) ... fetch and store protection ... direct control feature ... attachment for 2860 Selector Channel(s), 2870 Multiplexer Channel(s), and 2880 Block Multiplexer Channel(s) ... storage configuration control ... writable control storage ... interval timer ... storage error checking and correction ... instruction retry ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... clear I/O. Channel Reconfiguration and four additional instructions on the M models: signal processor ... set prefix ... store prefix ... store CPU address.

Channels: Separate channels facilitate maximum overlap with processing. Channel speeds of 1.5 million bytes/second are standard and up to 3 million bytes/second with Two Byte Interface (#7850, 7851) on the 2880 Block Multiplexer Channel. Up to seven logical channels can be attached per CPU. Valid combinations include: (a) One 2870 plus up to six channels of 2860s and 2880s ... (b) Two 2870s plus up to five channels of 2860s and 2880s ... (c) If no 2870 is attached, only up to six channels, 2860s and/or 2880s, can be attached per CPU. See 2860, 2870, 2880.

With the addition of Extended Channels (#3855), up to twelve channels can be attached ... for valid combinations, see "Special Features." Depending upon data rates, all channels, including the Selector Subchannels and basic multiplexer channel of the 2870 can operate concurrently. Each selector or block multiplexer channel can control up to eight control units. The basic multiplexer channel and each Selector Subchannel of the 2870 controls up to eight control units. If one 2841 is attached, no other control unit can be attached to that Selector Subchannel ... see 2841.

PREREQUISITES: Each 3168-3 requires [1] At least one selector channel (2860), block multiplexer channel (2880), or a 2870 with at least one Selector Subchannel ... [2] One 3066 System Console mdl 2 ... [3] One 3067 Power and Coolant Distribution Unit mdl 3 ... [4] An appropriate 415Hz power input. Customer-supplied chilled water is required for cooling the system. See S/370 Installation Manual - Physical Planning, GC22-7004.

Each AP system requires [1] a 3168-3 Model A series processor ... [2] a 3062 APU mdl 1 ... [3] a 3066 System Console mdl 3 ... and [4] a 3067 PDU/CDU mdl 5.

An MP system requires two M CPU models of any size. Each M CPU model requires Multiprocessing (#5050) on both the 3066 mdl 2 and the 3067 mdl 3. The 3068 Multisystem Communication Unit is required for each one or two processor M system. If either of the processors is a mdl MP5, MP6, MP7, MP8, M35, M36, M37 or M38, Extended Storage Attachment (#3850) is required on the 3068.

Bibliography: GC20-0001

* Purchase Option is 50% under Term Lease Plan (TLP)

† NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.

- SPECIFY:** [1]. Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
- [2] Motor Generator Set and Starter: If desired, see M 10000 pages for ordering instructions and prices.
- [3] Channel Attachment: The basic 3168-3 has connection facilities for channels addressed 0-6. For channels 7-11, see Extended Channels (#3855).
- [4] Emergency Power-Off Control: May be required ... see "Special Features" and S/370 Installation Manual - Physical Planning, GC22-7004 for details. If two processors are installed and the 3602 is to be added and emergency power off ability is required on the systems, then the expanded Emergency Power Off Control (#3624) should be ordered.

- [5] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- [6] RETAIN/370: Customer must provide interface for FE DAU to the telephone line.

† RETAIN may be used with the 3168-3, however it is not required. Remote service is a customer option where it is available. When the option is selected, the customer must provide the telephone lines required for the service processor remote link capability. The customer must also arrange the connection of the telephone interface cable provided by IBM to the telephone network.

PRICES:	Mdl	TLP/		Purchase	MMMM
		MAC/ MRC	4 Year MLC		
3168	U31	\$ 70,920	\$ 64,480	\$2,311,700	\$5,180
	U32	73,960	67,250	2,386,700	5,320
	U33	77,000	70,020	2,461,700	5,460
	U34	80,110	72,850	2,538,700	5,610
	U35	83,670	76,090	2,628,700	5,820
	U36	86,710	78,860	2,703,700	5,960
	U37	89,750	81,630	2,778,700	6,100
	U38	92,790	84,400	2,853,700	6,240
	M31	72,770	66,160	2,375,300	5,190
	M32	75,810	68,930	2,450,300	5,330
	M33	78,850	71,700	2,525,300	5,470
	M34	81,960	74,530	2,602,300	5,620
	M35	85,520	77,770	2,692,300	5,830
	M36	88,560	80,540	2,767,300	5,970
	M37	91,600	83,310	2,842,300	6,110
	M38	94,640	86,080	2,917,300	6,250
	A31	72,910	66,290	2,357,200	5,600
	A32	75,950	69,060	2,432,200	5,740
	A33	78,990	71,830	2,507,200	5,880
	A34	82,100	74,660	2,584,200	6,030
	A35	85,660	77,900	2,674,200	6,240
	A36	88,700	80,670	2,749,200	6,380
	A37	91,740	83,440	2,824,200	6,520
	A38	94,780	86,210	2,899,200	6,660

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3066-2) Machine Group: D
Per Call: 3 Purchase Option: 55%* Warranty: A
Useful Life Category: 1 Termination Charge Months: 6
Termination Charge Percent: 25% Upper Limit Percent: 5%
Model/Feature Additional Charge in lieu of AU Charge: 15%

Model Changes: Field Installable.

3168 to 3168-3 Model CONVERSION Purchase Prices

3168 to 3168 U3	\$217,200	(no change in storage size)
3168 MP to 3168 M3	\$217,200	(no change in storage size)

3168-3 to 3168-3 Model CONVERSION Purchase Prices

3168 U3 to 3168 M3	\$63,600	(no change in storage size)
3168 U3 to 3168 A3	\$45,500	(no change in storage size)
3168 A3 to 3168 M3	\$18,100	(no change in storage size)

3168-3 to 3168-3 Model UPGRADE Purchase Prices

From To	U32	U33	U34	U35	U36	U37	U38
U31	\$75,000						
U32		\$75,000					
U33			\$77,000				
U34				\$90,000			
U35					\$75,000		
U36						\$75,000	
U37							\$75,000

3168-3 Processing Unit (cont'd)		M32	M33	M34	M35	M36	M37	M38
M31		\$75,000						
M32			\$75,000					
M33				\$77,000				
M34					\$90,000			
M35						\$75,000		
M36							\$75,000	
M37								\$75,000
		A32	A33	A34	A35	A36	A37	A38
A31		\$75,000						
A32			\$75,000					
A33				\$77,000				
A34					\$90,000			
A35						\$75,000		
A36							\$75,000.15	
A37								\$75,000

NOTES:

- There are no additional installation charges over the above model conversion and model upgrade prices.
- The above model conversion and model upgrades are field installable.
- Planning for Model Conversions and Model Upgrades: When a customer requires model (storage) upgrades in addition to a model conversion, the changes must not be consolidated into a single Also, model (storage) upgrades should be ordered individually in one-model increments.
- Field change from 3168-3 to a 3168 is not recommended.
- Customer price quotations and customer order acknowledgment letters for purchase must state: "All parts which are removed from purchased processors to accomplish a model change to and from the A series become the property of IBM."

SPECIAL FEATURES

ISC CONTROL STORE EXTENSION (#2150). Provides additional control store for microprogram use on the ISC (#4650). When the Staging Adapter for ISC (#7220) is NOT ordered, see "Specify" under Integrated Storage Controls (#4650) to determine when required. **Note:** When #7220 IS ordered, #2150 is prerequisite. **Maximum:** One. **Field Installation:** Yes.

EXPANDED CONTROL STORE (#2151). Provides additional control store for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (#4650) to determine when required. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ISC Control Store Extension (#2150), and Register Expansion (#6111).

ISC/SA CONTROL STORE ADDITIONAL (#2152). Provides additional control store for microprogram use on ISC. Required if 3350 DASD is attached with Staging Adapter for ISC (#7220). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Register Expansion (#6111), Expanded Control Store (#2151), and Staging Adapter for ISC (#7220).

EMERGENCY POWER-OFF CONTROL (#3623, 3624). To provide, in effect, a single Emergency Power-Off Switch in a "room" or "area" ... see "Emergency Power-Off" in "Systems" and SRL GC22-7004 for details. #3623 -- to interconnect 2 Emergency Power-Off Switches ... #3624 -- to interconnect up to 12 Emergency Power-Off Switches. **Field Installation:** Yes.

EXTENDED CHANNELS (#3855). To attach up to twelve channels, in combinations of 2860 Selector Channels, 2870 Multiplexer Channels and 2880 Block Multiplexer Channels. A maximum of twelve channels, or a total of seven channel frames, whichever occurs first, can be attached. The feature includes the capability of addressing channels 7 thru 11. Valid maximum channels attachable are:

- 2860s -- maximum 6 channels
- 2870s -- maximum 2 channels
- 2880s -- maximum 11 channels.

Limitations: 2860 channel addresses must be numbered one thru six. The first 2870 must be numbered zero. The second 2870 must be numbered one thru six. The 2880 channel addresses may be any number one thru eleven. If the address of the 2880 is seven thru eleven, only 2301s, 2303s, 2305s, 2311s, 2314s, 2321s, 2420s, 3211s, 3330s, 3340s, 3350s, 3420s, 3505s or 3705s may be attached. **Field Installation:** Yes.

HIGH SPEED MULTIPLY (#4525). Improves processor speed in both fixed and floating point multiply operations. **Field Installation:** Not recommended. **Prerequisites:** High Speed Multiply (#4525) on the 3066 System Console mdl 2 and on the 3067 Power and Coolant Distribution Unit mdl 3 and/or mdl 5. **Specify:**[A mdls

only] #9440 for #4525 on the 3062 APU, or #9441 for no #4525 on the 3062 APU.

INTEGRATED STORAGE CONTROLS (ISC) (#4650). Provides for the attachment of 3333s (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdl A2s/A2Fs when Staging Adapter for ISC (#7220) is NOT ordered. Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl Bs and/or 3344s to the 3340 mdl A2, or by attaching 3350 mdl Bs and/or a mdl C to the 3350 mdl A2/A2F ... see DASD Configuration table below and 3333, 3330, 3340, 3350 "Machines" pages. The ISC is organized functionally into two separate paths with up to 16 drives per path ... up to 32 drives per path when ISC Control Store Extension (#2150) is installed. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Each ISC path requires a control unit position on a block multiplexer channel. **Specify:** The following applies only when Staging Adapter for ISC (#7220) is NOT ordered:

The available combinations of storage devices that can be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required DASD Specify Features" are installed. Based on the DASD, and the Special Features listed below being ordered for them, order the Required DASD Specify Feature(s). **NOTE:** The selected "Required DASD Specify Feature(s)" applies to both ISC paths. Within this constraint the DASD Configuration on one ISC path may be different from that on the other path.

ISC (#4650) WITH ONE CHANNEL OR WITH TWO CHANNEL SWITCH (#7905)

DASD CONFIGURATION		Required DASD Specify Features *											
		9313 †	9314 †	9314† 9190†	9315 †	9315† 9190†	9317 †	9318 †					
3333 Only	One or two 3333s with associated 3330s	x	x										
	Up to four 3333s with associated 3330s				x	x							
	String Switch #8150 on any 3333	x			x								
3340 Only	One or two 3340 mdl A2s with associated mdl B1/B2s		x	x	x			x					
	Up to four 3340 mdl A2s with associated mdl B1/B2s					x	x	x	x				
	String Switch #8150 on any 3340 mdl A2		x			x	x	x					
	Fixed Head Feature #4301/4302 on any 3340				x		x	x					
3340/3344	Up to four 3340 mdl A2s of which up to two may attach 3344s									x	x		
	String Switch #8150 on any 3340 mdl A2 and/or Fixed Head Feature #4301/4302 on any 3340										x		
3333/3340 (not 3344)	3333s and 3340 mdl A2s (any combination of two, three or four) each with associated drives					x	x		x	x			
	String Switch #8150 on any 3333 or 3340 mdl A2					x			x				
	Fixed Head Feature #4301/4302 on any 3340								x	x			
3350 Only	Up to four 3350 mdl A2s/A2Fs w associated mdl B2s/B2Fs, C2s/C2Fs											x	x
	String Switch #8150 on any 3350 mdl A2/A2F, C2/C2F											x	
3333/3340/3350 (not 3344)	3333s, 3340 mdl A2s and 3350 mdl A2s/A2Fs (any combination of 2, 3 or 4) with associated drives												x
	String Switch #8150 on any 3333, 3340 mdl A2, or 3350 mdl A2/A2F, C2/C2F and/or Fixed Head Feature #4301/4302 on any 3340												x

† ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

* Any change to an installed DASD Configuration requires an MES ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.



3168-3 Processing Unit (cont'd)

- ** ISC Control Store Extension (#2150) is prerequisite. With #9315, each path of the ISC requires 32 contiguous device addresses regardless of the number of drives attached.
- + Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the 3830-2 uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 mdl A2s on the first and third strings may attach up to three 3340 mdl B1, B2s, and/or 3344s in any combination. The 3340 mdl A2 on the second string may attach up to three 3340 mdl B1/B2s. The 3340 mdl A2 on the fourth string may attach one 3340 mdl B1 or B2.
- ++ Expanded Control Store (#2151), Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group each ISC path uses 8 or 16 or 32 or 64 device addresses depending upon the respective DASD configuration installed and whether any 3350 drive is in 3330-1 compatibility mode.

REGISTER EXPANSION (#6111). Provides additional registers for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (#4650) to determine when required. **Field Installation:** Yes. **Maximum:** One.

REMOTE SWITCH ATTACHMENT (#6148). To attach the Two Channel Switch for ISC (#7905) to the configuration control panel on the 3068 Multisystem Communication Unit. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Two Channel Switch for ISC (#7905).

7070/7074 COMPATIBILITY (#7127). Provides the system with the ability to execute 7070 and 7074 instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. 7070/7074 system features included are: Channels, 729 magnetic tape, 7501 Console Card Reader, and Floating Point Decimal Arithmetic. **NOT** included are: Teleprocessing equipment, disk storage, punched card I/O, printer, Hypertape, Interval Timer, and core storage addresses above 9989. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." **Limitations:** Cannot be installed with any other compatibility feature. Cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730). **Field Installation:** Not recommended. **Prerequisites:** 7070/7074 Compatibility (#7127) on the 3066 System Console mdl 2 and on the 3067 Power and Coolant Distribution Unit mdl 3.

7080 COMPATIBILITY (#7128). Provides the system with the ability to execute 705 and 7080 instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. 7080 system features included are: Channels, punched card input, typewriter, and 729 magnetic tape. **NOT** included are: Teleprocessing equipment, disk storage, Hypertape, and 705 units on-line with the 7080. Only the 7080 is emulated, but 705 programs can be run because the "705 mode" of the 7080 is emulated. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." **Limitations:** Cannot be installed with any other compatibility feature. Cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730). **Field Installation:** Not recommended. **Prerequisites:** 7080 Compatibility (#7128) on the 3066 System Console mdl 2 and on the 3067 Power and Coolant Distribution Unit mdl 3.

709/7090/7094/7094 II COMPATIBILITY (#7129). Provides the system with the ability to execute 709, 7090, 7094 and 7094 II instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. Included are the following features of those systems: Channels, punched card I/O, printer, and 729 magnetic tape. **NOT** included are: Hypertape, teleprocessing equipment, direct couple, disk storages, drum storages, 1401 adapter, direct data on 7094 special and custom systems. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." **Limitations:** Cannot be installed with any other compatibility feature. Cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730). **Field Installation:** Not recommended. **Prerequisites:** 709/7090/7094/7094 II Compatibility (#7129) on the 3066 System Console mdl 2 and on the 3067 Power and Coolant Distribution Unit mdl 3.

STAGING ADAPTER FOR ISC (#7220). Enables each path of the ISC to attach a maximum of four 3333 Mdl 1 and 11 and/or 3350 Mdl A2/A2F's with associated 3330 Mdl 1, 2 and 11 and 3350 Mdl B2/B2F and C2/C2F, for a maximum of 32 drives per path. See 3333, 3330 and 3350 for additional information. Also see note on M3333 pages for feature changes required when 3333's are retained for use with a 3851. Provides up to 64 virtual 3330 addresses for each channel interface on each path of the ISC. Provides for the attachment of up to four Data Recording Controls in one or two 3851 Mass Storage Facilities to each path of the ISC. **Maximum:** One. **Field Installation:** Yes ... must include removal of any of the following which are installed: #9190, 9313, 9314, 9315, 9317, 9318. **Prerequisites:** Integrated Storage Controls (#4650) and ISC Control Store Extension (#2150). For 3350 attachment the additional prerequisites are Expanded Control Store (#2151), Register Expansion (#6111)

and ISC/SA Control Store Additional (#2152). **Limitations:** If String Switch (#8150) is installed on a 3333, see writeup for this feature on 3333 "Machines" page. 3340 drives cannot be attached to the ISC when #7220 is installed. 3350 drives attached to the ISC when #7220 is installed cannot be used as staging drives and must be designated as real in 3350 native mode only. 3350 devices may not be mixed with other type devices in the same string. **Specify:** #9319 (Staging Adapter 3333/3330/3350).

SYSTEM/370 EXTENDED (#7730). Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. **Field Installation:** Yes. **Prerequisites:** Required on each processor in an MP system, and on the A-series processor in an AP system. System/370 Extended (#7730) is also required on the 3062 Attached Processing Unit in an AP system. **Limitation:** This feature cannot be loaded, at IMPL time, concurrently with 7070/7074 Compatibility (#7127), 7080 Compatibility (#7128), or 709/7090/7094/7094 II Compatibility (#7129).

3213 INTEGRATED PRINTER ATTACHMENT (#7850). Provides the interface needed to attach the optional 3213 Printer to the service processor on the 3168-3. The 3213 can be used to print error data captured and stored in the service processor. The printer does not attach to the channel interface. **Field Installation:** Yes.

TWO CHANNEL SWITCH FOR ISC (#7905). To provide each of the two paths of an ISC with the capability of attaching to a second channel. The channels may be on the same CPU or different CPUs. Switching is under program control. Each path of the ISC can be dedicated to a single channel by means of a Configuration Switch. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** An available control unit position and eight unshared subchannels on a system block multiplexer channel. For S/370 mdl 195 and S/370 mdls 165, 168, 195, see 2880 Block Multiplexer Channel. For S/370 mdls 135, 135-3, 138, 145, 145-3, 148, 155, 158, and 3031, 3032 or 3033 Processor, see 3135, 3135-3, 3138, 3145, 3145-3, 3148 3155, 3158 and 3031, 3032 or 3033 Processor respectively. For 4300 Processors, see 4341.

Special Feature Prices:	TLP/		Purch	MMMC
	MAC/	MLC		
	MRC	4 Yr		
ISC Control Store Extens #2150†	\$ 526	\$ 478	\$ 21,060	\$ 23.00
Expanded Control Store 2151†	318	289	12,720	23.00
ISC/SA Cntrl Store Add'l 2152†	318	289	12,720	23.00
Emergency Power-Off Control				
for 2 switches	3623	NC	NC	NC
for up to 12 switches	3624	NC	NC	NC
Extended Channels	3855	554	504	26,810
High Speed Multiply	4525	3,035	2,780	145,950
Integrated Storage Cntrls	4650†	1,920	1,745	77,600
Register Expansion	6111	47	43	1,280
Remote Switch Attach	6148	NC	NC	NC
7070/7074 Compatibility	7127	3,160	2,875	151,600
7080 Compatibility	7128	3,160	2,875	151,600
709/7090/7094/7094 II				
Compatibility	7129	3,160	2,875	151,600
Staging Adapter for ISC	7220*†	2,065	1,875	83,200
System/370 Extended	7730	3,575	3,250	65,000
3213 Intgrd Printer Adptr	7850	72	66	2,425
Two Channel Sw for ISC	7905	351	319	14,220

* Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this feature involves the removal of parts which become the property of IBM."

† Feature supplies ISC diskette.

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**3195 PROCESSING UNIT**
[No Longer Available]

Purpose: Provides arithmetic, logic, control and processing storage for a S/360 or S/370 mdl 195.

Models: For S/360

Model J	1,048,576 bytes
Model K	2,097,152 bytes
Model KJ	3,145,728 bytes
Model L	4,194,304 bytes

For S/370

Model J1	1,048,576 bytes
Model K1	2,097,152 bytes
Model KJ1	3,145,728 bytes
Model L1	4,194,304 bytes

Highlights: Depending upon the model, includes up to 4,194,304 bytes with a 756-nanosecond cycle time ... eight byte parallel data flow ... includes 32,768 bytes of 54-nanosecond cycle buffer storage which is transparent to the programmer and reduces the effective cycle time of processor storage ... buffer storage does not increase the amount of addressable storage ... 54-nanosecond processor cycle ... double words are eight-way interleaved on mdl J; sixteen-way on mdl K and L; sixteen-way on the first 2 million bytes and eight-way on the third million bytes on mdl KJ ... overlapped operation of instruction and execution units, as well as concurrent operations in multiple execution units and with the instruction unit ... performance emphasis on floating point arithmetic.

Because of the high performance emphasis, there are operational differences from other S/360 and S/370 models.

- [1] The quotient of a floating point divide operation may differ in the mdl 195 from that of other models by an amount equal to one bit in the low order fraction position. For zero remainders, however, the results will be identical.
- [2] Several program interruptions that should, according to the *IBM S/360 Principles of Operation*, store a non-zero Instruction-Length Code (ILC) are imprecise in the mdl 195 and store a zero ILC. This zero ILC indicates that the address of the instruction causing the interruption has not been retained. When precise program interruptions occur, the interruption code portion of the current PSW is used in a special way.
- [3] The mdl 195 is capable of executing processor stores out of sequence. Logical consistency is maintained among processor fetches and stores -- including the beginning and ending I/O operations. However, if a program is to modify a string of CCWs while they are being used by the channel, then steps must be taken to arrange the program so that the stores are made in sequence. This is described in the *Model 195 Functional Characteristics* (GA22-6943).
- [4] If a floating point underflow occurs, the result will be replaced by all zeros. If an overflow occurs, the result will be replaced by all ones with the correct sign. For those instructions that change the condition code, the code is 1 or 2 for overflow, and 0 for underflow.

With each 3195, a Basic Storage Module Analyzer and one additional basic storage module is provided, along with two carriers. Each carrier provides for supporting and moving a basic storage module from the processor to a service area. Use of these items normally reduces the duration of system interruption when a failure occurs in one of the basic storage modules in the system. IBM maintenance agreements normally allow for off-line servicing and repair of a failing basic storage module.

Standard Features (All Models) -- universal instruction set, extended precision floating point arithmetic, fetch protection (read and write), internal timer (9.6 khz -- about 104us interval), byte-oriented operands, direct control, attachment for 2860 Selector Channels, 2870 Multiplexer Channels, and 2880 Block Multiplexer Channels.

Additional Standard Features (S/370 Models) -- in addition to those features listed above, the S/370 models include a 250-nanosecond time-of-day clock, additional variable field length instructions, control registers (expanding the functions of the PSWs).

Channels -- separate channels facilitate maximum overlap with processing. Channel speeds up to 1.5 million bytes/second are standard and up to 3.0 million bytes/second with Two Byte Interface (#7850, 7851) on the 2880 Block Multiplexer Channel. Up to seven logical channels can be attached per CPU. Valid combinations include: (a) One 2870 plus up to six channels of 2860s and/or 2880s ... (b) Two 2870s plus up to five channels of 2860s and/or 2880s ... (c) If no 2870 is attached only up to six channels, 2860s and/or 2880s, can be attached per CPU. See 2860, 2870 and 2880. With the addition of Extended Channels (#3851),

up to fourteen channels can be attached ... for valid channel combinations, see "Special Features." Depending upon data rates, all channels, including the Selector Subchannels of the 2870s, can operate concurrently. Each selector or block multiplexer channel can control up to eight control units. The basic multiplexer channel of the 2870 and each Selector Subchannel controls up to eight control units. The 2841 is restricted to one control unit per Selector Subchannel ... see 2841.

Limitations: A 3195 can accommodate three 2880 channels attaching either the 2835 Storage Control mdl 1 or 2, or the 2820 Storage Control. The channels attaching 2835s or 2820s must be assigned the highest priorities in the system.

Console Function -- an operator control panel, a system control panel and a display console are included with the 3060 mdl 1. They have switches and lights necessary to operate and control the system. The display console may be used as an operator's console. The display console is functionally equivalent to a 2250 mdl 1 with the following features: alphameric keyboard, 8K buffer (4K is maintenance only), character generator, light pen, and OCP, First. The operator control section may be duplicated once to provide a remote operator panel by ordering the appropriate feature on a 2150 Console or 2250 Display Unit mdl 1 ... see 2150 and 2250. An optional operator console function can be provided by using a 2150 and a 1052 Printer-KeyBoard mdl 7 in combination ... see 2150. Additional console functions can be provided through use of other I/O units such as readers, displays, punches and printers.

Emergency Power-Off Control, a standard feature on the 3060, provides, in effect, a single emergency power-off switch in a "room" or "area." To interconnect up to six Emergency Power-Off Switches, see "Emergency Power-Off" under S/360 in "Systems" and *S/360 Installation Manual - Physical Planning*, GC22-6820, for details.

PREREQUISITES: Each 3195 requires: [1] At least one selector channel (2860), or block multiplexer channel (2880), or a 2870 with at least one Selector Subchannel ... [2] One 3060 System Console ... [3] One 3080 Power Unit mdl 1, one 3080 mdl 2 and one 3080 mdl 3 ... [4] One 3085 Power Distribution Unit ... [5] One 3086 Coolant Distribution Unit ... [6] A Motor Generator Set with Motor Starter. See "Specify."

Customer-supplied chilled water is required for cooling the system ... see *S/360 Installation Manual - Physical Planning*, GC22-6820.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Motor Generator and Starter: See M 10000 pages for ordering instructions and prices.

[3] Remote Operator Control Panel Attachment: #9560, required if the operator control panel of the 3195 is to be duplicated by use of an Operator Control Panel (#5475, 5476) on a 2150 Console or 2250 Display Unit mdl 1. Can be field installed.

[4] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[5] RETAIN/370: #9570 for non-use of FE DAU, #9571 for first CPU using FE DAU, #9572 for second CPU using FE DAU, or #9573 for third CPU using FE DAU. Customer must provide interface for FE DAU to the telephone line.

SPECIAL FEATURES

The following special feature is on an "As Available" basis for field installation.

EXTENDED CHANNELS (#3851). Provides for attachment of up to fourteen channels, combinations of 2860 Selector channels, 2870 Multiplexer Channels, and 2880 Block Multiplexer Channels. A maximum of fourteen channels or a total of eight channel frames, whichever occurs first, can be attached. Valid maximum combinations of channels are:

2860s -- maximum of 2 (6 channels)
2870s -- maximum of 2 (2 channels)
2880s -- maximum of 7 (13 channels)

Limitations: The 2860 channel addresses must be numbered one thru six. The first 2870 channel must be number zero, the second must be any number one thru six. The 2880 channel addresses may be any number one thru thirteen. If the address of the 2880 is seven thru thirteen, only 2301s, 2303s, 2305s, 2311s, 2314s, 2321s, 2420s, 3211s, or 3330s may be attached. **Field Installation:** Yes. **Prerequisites:** On 2150 -- #9175 if Operator Control Panel, First (#5475) is to be installed on the 2150 ... #9176 if Operator Control Panel, Second (#5476) is to be in-

† NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.



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3195 Processing Unit (cont'd)
stalled. On 2250 -- #9175 if Operator Control Panel, First
(#5475) is to be installed on 2250 ... #9176 if Operator Control
Panel, Second (#5476) is to be installed.

**IBM 3203 PRINTER**

Purpose: Printer output unit for all virtual storage S/370s, 3031, 3032, 3033, 4331 and 4341 Processors, and the 3777 Communication Terminal.

- Model 1** -- 600 lpm ... native attachment on S/370 mdls 115, 125 only.
- Model 2** -- 1200 lpm ... native attachment on S/370 mdls 115, 125 only.
- Model 3** -- 1000 lpm ... for use with a 3777 Communication Terminal.
- Model 4** -- 1200 lpm ... native attachment on S/370 mdls 138, 148 only.
- Model 5** -- 1200 lpm ... channel attachment to a virtual storage S/370, a 3031, 3032, 3033, 4331 or 4341 Processor.

All rated speeds are based on a 48 character set.

Highlights: 132 print positions are standard. Horizontal spacing is 10 characters per inch. Vertical spacing is 6 or 8 lines per inch under operator control.

Forms skipping and spacing are controlled by a forms control buffer. The carriage is a dual speed unit for mdls 1, 2, 4 and 5 and single speed for mdl 3. Normal skipping for mdls 1, 2, 4 and 5 is up to 24" per second with high speed skip of up to 55" per second after 6 lines have passed. The carriage speed for mdl 3 is up to 18" per second.

A Universal Character Set buffer of 240 positions is standard. Use of graphics sets from 30 to 240 characters are allowed. Print speeds vary depending upon frequency of character repetition on the cartridge. One 1416 Interchangeable Train Cartridge is required for each 3203 Printer. The 3203 uses the proven train printing principle of the 1403 mdl N1 and maintains comparable high quality printing. Additionally, the 3203 has the capability of producing better copies.

Continuous marginally punched forms are fed by a forms tractor. Maximum forms dimensions are: *Width* -- 20 inches; *Length* -- 24 inches. Minimum forms dimensions are: *Width* -- 3-1/2 inches; *Length* -- 3 inches. Models 1, 2, 4 and 5 of the 3203 have a power assisted stacker.

For full flexibility of column location for margins, 17-25/32 inches maximum width is recommended. If forms greater than 14" in length are used, rear stacker enclosure must be opened. If forms greater than 17 inches in length are used, forms compartment front door must be opened. See SRL GA24-3488, *Forms Design Manual*.

Limitations: [1] Only marginally punched, pin fed, continuous forms can be used. For multiple part forms, it is preferred that both sides be securely fastened, however, when only one side is fastened it must be the right side. No staples are permitted in the print train area ... [2] The 3203 may be used to generate input in OCR applications ... see "Machines" sections on 1287, 1288, 3881 and 3886 for information on acceptable characters and printing devices ... [3] Multiple-part forms are not recommended for OCR printing. The print quality of the top sheet is affected by the underlying sheets. Under no circumstances should the copy sheets be used for optical scanning. For best results, use single-part forms for OCR printing ... [4] Print quality and forms feeding varies with paper specifications, ribbon and number of copies. Multiple copy forms of more than four parts and forms with a first part heavier than 13-pounds (49 grams/sq. meter) should be tested under operating conditions to determine that results are satisfactory for the user's application.

Maximum: Only one 3203 mdl 1 or 2 can be natively attached to a S/370 mdl 115 or 125. Only one 3203 mdl 3 can be attached to a 3777. A maximum of two 3203 mdl 4s can be natively attached to a S/370 mdl 138 or 148. 3203 mdl 5 is limited only by the number of control unit positions available on a system channel.

Supplies: ribbons

Prerequisites: A 1416 Interchangeable Train Cartridge is required for each 3203. In addition, the following are required, depending upon the 3203 model.

- Model 1** An Integrated 3203 Printer Attachment (#4650) on the 3115 or 3125. In addition, on the 3115 only, Integrated 3203/5203 Printer Prerequisite (#4653) is required. On the 3115 and 3125, specify #9770 for 3203 mdl 1.
- Model 2** #4650 on the 3115 or 3125. In addition, on the 3115 only, #4653 is required. On the 3115 and 3125, specify #9771 for 3203 mdl 2.
- Model 3** A 3777 Communication Terminal mdl 1, 2 or 3.

Model 4 A 3203-4 Printer Attachment (#8075) for the first 3203 mdl 4 and (#8076) for the second 3203 mdl 4 on the 3138 or 3148.

Model 5 An available control unit position on a system channel.

Bibliography: S/370 -- GC20-0001, S/3770 -- GA27-3097

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage for the model 1, 2 or 4.

[2] Color: Models 1, 2 and 4 -- #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white. Model 3 -- blue is supplied as standard. Model 5 -- white is supplied as standard on printers shipped from the plant only. orders will retain original color.

[3] Train Arrangement: See System/370 and 3777 -- 3203 Printer in "Type Catalog" and 1416 in "Machines" section for arrangements and required feature numbers.

[4] System Attachment: Specify #9501 for S/370 mdl 115 Adapter, or #9502 for S/370 mdl 125 Adapter or #9503 for the first 3203 mdl 4 on S/370 mdl 138 or mdl 148 and #9504 for the second 3203 mdl 4 on S/370 mdl 138 or mdl 148.

[5] First 3203 Model 5 Installed: #9190 ... required on the first rental 3203 mdl 5 to be installed at a customer installation. This provides a tool kit required for CE maintenance. Additional tool kits are available if required for a multiple machine installation. When installed rental 3203 mdl 5s are purchased, a tool kit can be ordered no-charge for each printer requiring one.

[6] OCR: When OCR ribbons are used for either OCR printing or other applications, specify #9488. FIELD INSTALLATION: Yes.

PRICES:	Mdl	ETP/ MLC		Purchase	MMMC
		MAC/ MRC	2 Yr		
3203	1	\$1,035	\$ 881	\$27,360	\$238
	2	1,357	1,155	35,280	310
	3	1,058	900	28,800	252
	4	1,357	1,155	35,280	310
	5	1,475	1,255	38,320	340

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Machine Group: B Warranty: B Per Call: 3
Metering: I/O Unit (onlin) Purchase Option: 40%
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 10%
Upper Limit Percent: 0% Useful Life Category: 2

Model Changes: Can be made in the field between models 1, 2, 4 and 5.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges.)

From Model 1 to Model 2 \$16,000
From Model 2 to Model 4 \$ 9,750
From Model 4 to Model 5 \$19,500

Model upgrades of mdls 1 to 4, 1 to 5, or 2 to 5 require multiple orders. Prices are additive.

SPECIAL FEATURES

SPEED ENHANCEMENT (#6360). [Model 3 Only] Provides capability to operate the 3203 mdl 3 at 1200 lpm. **Maximum:** One. **Prerequisite:** Print Speed Enhancement (#5595) on the 3777. **Field Installation:** Yes.

Special Feature Prices:	ETP/ MLC		Purchase	MMMC
	MAC/ MRC	2 Yr		
Speed Enhancement #6360	\$59	\$50	\$2,000	NC

IBM 3210 CONSOLE PRINTER-KEYBOARD

Purpose: Selectric® console typewriter for use as an input (keyboard) and output (printer) unit for a S/370 mdl 135, 135-3, 145, 145-3 or 155.

Model 1 For mounting on the console table reading board.

Model 2 For remote use ... not available for the S/370 mdl 135, 135-3, 138.

Model Changes: Not recommended for field installation.

Highlights: Both models consist of a Selectric keyboard printer. Model 1 is to be mounted on the 3135, 3135-3, 3145, 3145-3 or 3155 reading board ... Model 2 is supplied with a stand which can be located up to 75 feet from the processor. For the mdl 1, a



3210 Console Printer-Keyboard (cont'd)

forms rack is supplied with the system. A forms rack is standard with the mdl 2.

In both models, the keyboard and printer operate independently under program control. The general facilities provided are: direct data entry into the system, printed output from the system, and switches and lights for system control.

The keyboard on both models is similar to other Selectric typewriters. However, it provides only those functions useful and necessary in a system console. Functions such as tab, tab set and clear, backspace, ribbon shift and end-of-line bell are not included. On model 1, keys and lights are provided so that the operator can "display and alter" processor storage and system control information.

The printer for both models has an 88-character data set and a 125-character print line. It operates at a rated speed of 15.5 characters/second, has a stationary carriage, and an interchangeable print element. A 15-inch carriage provides a 12-1/2" writing line at 10 characters/inch. A 6 lines/inch pin feed platen (13-1/8" pin-to-pin) is standard. A maximum of an original and five carbon copies can be prepared, depending upon paper, carbon quality and thickness. A Data Font 1, dual case printing element is provided ... see page TC 22 in "Type Catalog" section for character layout.

Limitation: One of each model can be attached to a system ... Model 1 cannot be attached if a 3215 Console Printer-Keyboard is installed.

PREREQUISITES: **Model 1** -- requires a 3210 Mdl 1 Adapter (#7844) on the 3135, 3135-3, 3145, 3145-3 or 3155 Processing Unit. **Model 2** -- requires a 3210 Mdl 2 Adapter (#7845) on the 3145, 3145-3 or 3155 Processing Unit.

Bibliography: S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): [Mdl 2 only] -- #9901 for 115 V, #9902 for 208 V, or #9904 for 230 V.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC	
	3210	1	\$ 196	\$ 179	\$ 5,935	\$146
		2	201	183	6,100	155

Plan Offering: Plan B or Term Lease Plan Maintenance: C
Warranty: B Purchase Option: 35% † Per Call: 3
Useful Life Category: 1 Termination Chg Mnths: 6
Termination Chg Percent: 25% Upper Limit Percent: 5%

IBM 3211 PRINTER

Purpose: Printed output unit for a S/360 mdl 22, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195, any S/370 Processor (except 3115 or 3125), or any 4300 Processor.

Highlights: 2,000 lpm rated speed for nine equal and like arrays of 48 character sets. Other speeds are obtained when using other character arrays repeated with different frequencies. The Universal Character Set capability is standard. Also, 3216 Interchangeable Train Cartridge must be specified. This allows maximum flexibility in train layout to obtain speed for varying character sets.

The 3211 Printer has 132 print positions as standard, 18 additional positions are available as a special feature. Horizontal spacing is 10 characters per inch. Vertical spacing is 6 or 8 lines per inch under program control. Continuous marginally punched form spacing and skipping is controlled by a Forms Control Buffer, a standard feature of the 3811. This program controlled buffer allows skipping at 30 inches per second with a high speed skip of 90 inches per second after 7 lines have passed. Maximum form length is 22.5 inches at 8 lines per inch and 24 inches at 6 lines per inch. Form width may vary from 3.5 inches to 18.75 inches. Minimum form length is 3 inches. A pair of guides may be purchased for use with forms having a fanfold depth greater than 18" ... see M 10000 pages for ordering. The 3211 is used in Optical Character Recognition applications when equipped with the OCR Print Package feature. A powered stacker helps refold the forms after they are printed.

PREREQUISITES: [1] One 3811 Printer Control Unit for each 3211 Printer ... see 3811 for attachment details. [2] One 3216 Interchangeable Train Cartridge for each 3211 Printer ... see 3216 for details.

Limitations: Form sets of more than four parts should be tested for density of the last copies. Multiple-part forms are not recommended for OCR printing. The print quality of the top sheet is

* FTP = 12-23 months.

† Purchase Option is 50% under Term Lease Plan (TLP)

affected by the underlying sheets. Under no circumstances should the copy sheets be used for optical scanning. For best results, use 20-24 lb Bond in single-part forms for OCR printing. OCR forms utilizing other papers should be tested for satisfactory results with user requirements. When reading 3211 documents on the 3886, Reread On Reject capability and 3211/5211 Compatibility (#9701) should be used on the 3886.

For preprinted forms having print position 1 more than 1.3" (33.02mm) from the left edge, electronic indexing will be needed ... see GA24-3543. For layout dimensions, see GA24-3488. For forms sets that vary in thickness in excess of 0.003" (0.0762mm) across the width or length of the form, see GA24-3488.

The 3211 may be used to generate input in OCR applications ... see "Type Catalog," 3216 Interchangeable Train Cartridge section for printable OCR characters. The OCR Print Package (#5450) is a prerequisite for OCR applications.

For 3211 Printer diagnostic support, OLTEP facilities are required under DOS or OS. Stand alone diagnostics require 32K storage and a disk or tape.

Arrays of less than 27 characters should not be used on the 3211 Printer.

Paper form crimp should be on the left side of the form ... see *Forms Design Consideration for System Printers*, GA24-3488.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Kickstrips: #9350, if desired ... also available When kickstrips are installed, the open area underneath the machine is enclosed. They reduce the amount of "toe-room" and may be inconvenient to the user if the power outlet is located beneath the machine.

[4] Required for use in OCR printing: #5450 ... see "Special Features" below.

[5] Tool Kit: #9710 (standard) or #9711 (OCR). Required for CE maintenance. For Rental Customer -- Specify #9710 on first 3211 without OCR Print Package (#5450) ordered for a customer; Specify #9711 on first 3211 with #5450 ordered for a customer. If required for a multiple machine installation, an additional Tool Kit(s) is available no-charge For Purchase Customer -- Specify #9710 on each 3211 without #5450 machine order; Specify #9711 on each 3211 with #5450 machine order. When installed rental 3211s are purchased, a Tool Kit is to be ordered on no-charge for each machine.

PRICES:	Mdl	MAC/ MRC	MLC 1 Yr*	MLC 2 Yr	Purchase	MMMC
	3211	1	\$2,000	\$1,840	\$1,680	\$50,900 \$533

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: B Per Call: 3 Purchase Option: 40%
Metering: I/O Unit (Online)(meters 3811) Warranty: B
Useful Life Category: 2 Termination Chg Mnths: 5
Termination Chg Percent: 25% Upper Limit Percent: 0%
Model/Feature Additional Charge in Lieu of AU Charge: 10%

SPECIAL FEATURES

OCR PRINT PACKAGE (#5450). Provides additional Manual Operator Platen Controls - required for OCR applications. **Field Installation:** Yes, on machines with serial number above 10081. Available at time of manufacture only for machines with serial numbers below 10082. **Prerequisite:** Tool Kit (#9711) ... see "Specify."

PRINT POSITIONS, 18 ADDITIONAL (#5554). Increases print positions from 132 to 150. Operation of the 3211 Printer remains unchanged. **Field Installation:** Yes. **Prerequisite:** Print Positions, 18 Additional (#5553) on the 3811 Printer Control Unit.

Special Feature Prices:	MAC/ MRC	MLC 1 Yr*	MLC 2 Yr	Purchase	MMMC
OCR Print Package	#5450	\$856	SUC	--	\$ 816 NC
Print Pos, 18 Add'l	5554	63	\$58	\$53	2,050 \$10.50



IBM 3213 CONSOLE PRINTER

Purpose: Printer for use with display console on a S/370 mdl 158, or with the service processor on the 3168-3.

Highlights: Prints serially at a maximum rate of 85 cps. The maximum print line is 126 print positions at 10 characters/inch. Matrix characters are formed by 7 vertical wires, each printing a dot in up to 4 of 7 possible horizontal positions. Prints the 88 graphics of PTTC/EBCD.

The unit has a pin feed platen. One size should be specified, 120 positions, or 126 positions ... see "Specify." Marginally punched continuous forms paper can be fed. Maximum forms width is 13-1/8" (hole-to-hole). Up to six part forms can be printed with a maximum thickness of .018". Forms length can be 3" to 14" in increments of 1/6". Line spacing is 6 lines/inch. A Line Feed Select lever allows manual selection of single or double spacing. Refer to SRL GA24-3488 for forms design considerations and limitations.

Basic functions include fixed margins (dependent on platen size ordered), space, carriage return, line feed, and new line.

An optional forms stand is available ... see "Special Features."

PREREQUISITE: A 3213 Printer Adapter (#7840) on the 3158 Processing Unit, or a 3213 Integrated Printer Attachment (#7850) on the 3168-3 Processing Unit.

Supplies: A black ribbon, IBM Part No. 1136970 or equivalent, is recommended

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Pin Feed Platen: #9167 for 120 print positions (12-1/2" hole-to-hole), or #9162 for 126 print positions (13-1/8" hole-to-hole). NOTE: Do not order #9167 unless paper is available in your area.

PRICES	Mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
3213	1	\$ 235	\$ 214	\$7,635	\$105

Plan Offering: Plan B or Term Lease Plan Maintenance: B
Warranty: B Purchase Option: 40%† Per Call: 3
Useful Life Category: 2 Upper Limit Percent: 5%
Termination Chg Mnths: 6 Termination Charge Percent: 25%

SPECIAL FEATURES

FORMS STAND STACKER (#4450). [Purchase only] Permits placement of continuous forms (out of carton) on the stand above floor level and provides for continuous forms stacking and printing. Field Installation: Yes.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC
Forms Stand Stacker	#4450 N/A	\$ 54	NC

IBM 3215 CONSOLE PRINTER-KEYBOARD

Purpose: Printer-Keyboard for console I/O in a S/370 mdl 135, 135-3, 145, 145-3 or 155.

Highlights: Prints serially at a maximum rate of 85 cps. The maximum print line is 126 print positions at 10 characters/inch spacing. Matrix characters are formed by 7 vertical wires, each printing a dot in up to 4 of 7 possible horizontal positions. Prints the 88 graphics of PTTC/EBCD similar to the graphics shown on page TC 22 for the 3210 mdl 1 and 2.

The unit has a pin feed platen, one size should be specified, 120 positions, or 126 positions ... see "Specify." Marginally punched continuous forms paper can be fed. Maximum forms width is 13-1/8" (hole-to-hole). Up to six part forms can be printed with a maximum thickness of .018". Forms length can be 3" to 14" in increments of 1/6". Line spacing is 6 lines/inch. A Line Feed Select lever allows manual selection of single or double spacing.

† Purchase Option is 50% under Term Lease Plan (TLP)

Refer to SRL GA24-3488 for forms design considerations and limitations.

The keyboard is typewriter style with the top row of keys used for numerics and special characters. Functional keys and lights are located to the right and left for easy operator usage. Keys and lights are provided so that the operator can "display and alter" processor storage and system control information.

Basic functions include fixed margins (dependent on platen size ordered), space, carrier return, line feed, and new line. A forms stand is supplied with the system.

PREREQUISITE: A 3215 Adapter (#7855) on the 3135, 3135-3, 3145, 3145-3 or 3155 Processing Unit.

Limitation: Cannot be installed if a 3210 Console Printer-Keyboard mdl 1 is installed.

Supplies: Serial No. 12000 and below a black ribbon, IBM Part No. 1136906 or equivalent, is recommended
Serial No. 12001 and above a black ribbon, IBM Part No. 1136970 or equivalent, is recommended

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Pin Feed Platen: #9162 for 126 print positions (13-1/8" hole-to-hole), or #9167 for 120 print positions (12-1/2" hole-to-hole). NOTE: Do not order #9167 unless paper is available in your area.

PRICES:	Mdl	MAC/ MRC	TLP/ MLC 4 Yr	Purchase	MMMC
3215	1	\$ 224	\$ 204	\$ 8,990	\$82.50

Plan Offering: Plan B or Term Lease Plan Maintenance: A
Per Call: 3 Warranty: B Purchase Option: 40%†
Useful Life Category: 2 Upper Limit Percent: 5%
Termination Charge Months: 6 Termination Charge Percent: 25%

IBM 3216 INTERCHANGEABLE TRAIN CARTRIDGE

Purpose: A cartridge and print train which provides interchangeability of type font for the 3211 Printer.

Highlights: At least one 3216 is required when running a 3211 Printer. OCR type styles are available.

Interchangeability: When multiple 3216s are available, they can be interchanged by the operator, providing flexibility for printing different type fonts, type styles or character arrangements. Character sets up to 254 characters can be provided for unique requirements.

PREREQUISITE: The 3216 functions only when mounted in a 3211 Printer.

Bibliography: S/360 - GC20-0360, S/370 - GC20-0001

SPECIFY: [1] Print Train Arrangement - see "Type Catalog" for characters in each standard arrangement and feature #s to be specified.

[2] Storage Container: #9668, if needed for the 3216 ... recommended for storage use, when multiple 3216s are ordered for a single 3211.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
3216	1	\$ 411	\$10,530	268

Plan Offering: Plan B Maintenance: D Per Call: 3
Warranty: B Purchase Option: 30%
Useful Life Category: 2

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**IBM 3251 DISPLAY STATION**

Purpose: An interactive computer graphics display station for the display of graphical and alphanumeric data generated within a S/370 or 4300 Processor. The display station may have attachments for operator interaction with the displayed picture, thereby providing highly interactive man-machine communication.

The 3251 requires a 3255 Display Control and a 3258 Control Unit. It may be used in multiple display station configurations for Computer Aided Design, Computer Aided Manufacturing and scientific analysis applications. It is particularly suited to those applications requiring a high interaction rate and the display of pictures containing a high vector and character content.

Up to two 3251s can be attached to each 3255; the first 3251 must be sited adjacent to the 3255, the second 3251 may be located up to 15.2 m (50 feet) from the 3255. Up to four 3255s may be attached to each channel attached 3258; each 3255 may be located up to 1525 m (5000 feet) from the 3258.

Highlights:

- A free standing, tabletop mounted, interactive computer graphics display station for the display of graphical and alphanumeric data generated within a S/370 or 4300 Processor.
- A 534 mm (21 inch) diagonal, directed beam, display unit having a 305 mm x 305 mm (12" x 12") viewing area.
- Vector graphics - straight lines may be displayed between any of the 1024 x 1024 addressable positions on the screen. Display buffer orders are provided which enable the expression of vector endpoint coordinates in absolute form or incrementally, relative to the current beam position.
- Graphical data can be displayed as a series of points (Point Plot orders), or in one of four line types: - solid, dotted, dashed, dot-dashed (Vector Plot orders).
- Improved quality character set comprising both upper and lower case can be displayed either horizontally or vertically (90 degrees counterclockwise) in any of four sizes.
- Eight programmable intensities (including blank) for points, vectors or characters; the three brightest levels can be detected by the light pen.
- Audible and visible (blink) alerts which can be programmed to notify the display station operator of exceptional conditions.
- Free standing Alphanumeric Keyboard ... see *Special Features*.
- Backlighted 32 key Program Function Keyboard ... see *Special Features*.
- Light Pen ... see *Special Features*.
- The 3250 is generally upward compatible from the IBM 2250 Graphic Display model 3. Valid programs written for the 2250 can be used on the 3250 without change, with minor exceptions:
 - 3250 supports one cursor per display station.
 - Some previously undefined orders have a defined function in the 3250.
 - Lower case characters are displayed as lower case by the 3250.
 - 3250 does not have Program Function Keyboard overlay sense switches.
 - 3250 shares display buffers among a maximum of two display stations.
 - Undefined characters in 3250 text strings are treated as blanks or nulls.
- Software support via Graphic Programming Services (GPS), (which includes the Graphic Access Method (GAM), and Graphic Subroutine Package (GSP). These are SCP programs running under OS/VS1 and OS/VS2 operating systems.

Human Factors: The 3251 has an antiglare screen designed to reduce reflection in office lighting. Brightness and focus controls are provided for operator adjustment to best suit ambient lighting. Program Function Keyboard angled for operator convenience ... see *Special Features*. Low profile Alphanumeric Keyboard has separators to help prevent accidental striking of control keys. It also has a palm rest on the keyboard ... see *Special Features*. The keyboards are free standing to allow placement to suit the operator.

Input-Output Flexibility:

- Alphanumeric Keyboard with upper and lower case input, Cancel, Jump, Backspace, and Enter function keys, continuous-type key ... see *Special Features*. Input assisted by provision of visible cursor on the screen and display buffer orders enabling definition of fields either protected or unprotected from operator input.
- Program Function Keyboard with 32 backlighted keys. Lighting of keys is under S/370 or 4300 Processor program control ... see *Special Features*.
- Light Pen; hand held, pen-like device for interaction with the displayed image ... see *Special Features*.

Performance: Basic performance characteristics:

- Vector draw speed of 8890 m (350,000 inches) per second, i.e., 34 microseconds for 305 mm (12 inch) screen deflection.
- Vector move speed of 22 microseconds for 305 mm (12 inch) screen deflection.
- Character draw average speed of 4.2 microseconds for a BASIC size character [height 4.1 mm (0.16 inches)].

The amount of data displayable depends on many factors, including the mix of vectors and characters. With one 3251 attached to a 3255, then at 40 cycles per second regeneration rate, at least the following can be displayed:

- Either - 9,500 incremental vectors of 9.5 mm (0.375 inches),
- or - 2,150 Absolute vectors of 76 mm (3 inches),
- or - 5,250 BASIC size characters (average mix).

With two 3251s attached to a 3255 the performance is slightly less than half that shown above.

When the 3251 displays images at a regeneration rate of 40 cycles per second the picture quality is superior to that of images displayed by the IBM 2250 Display Unit model 3 at 40 cycles per second. As the picture content is reduced the regeneration rate increases up to a maximum of 46 cycles per second.

The High-Speed Link transfers data between the 3258 Control Unit and the 3255 Display Control at a maximum rate of 1M bits per second.

PREREQUISITES: A 3255 Display Control adjacent or up to 15.2m (50 feet) away ... maximum of two 3251s per 3255 ... see 3255.

Bibliography: GC20-0001

Specify: [1] Power (AC, 1-phase, 3 wire, 60 Hz): Locking Plug - #9880 for 115 V, #9884 for 208 V, #9886 for 230 V. Non-lock plug - #9881 for 115 V, #9885 for 208 V, #9887 for 230 V. A 3251 must be connected to the same supply phase as the 3255 to which it is attached.

[2] Power Cable Length: If standard 4.3 meter (14 feet) is not desired, specify #9511 for 1.8 meter (6 feet) power cable.

[3] Cables: For cables between 3251 and 3255, specify #9071 for the first head ... for the second head, if appropriate, specify #9071 for 4.6 meters (15 feet), #9072 for 9.1 meters (30 feet), or #9073 for 15.2 meters (50 feet).

PRICES:	Mdl	Purchase*	MMMC
3251	1	\$14,650	\$79.50
Warranty: B		Per Call: 3	Machine Group: D
Useful Life Category: 2			

SPECIAL FEATURES

ALPHANUMERIC KEYBOARD (#4621). Typewriter-like layout, movable, with data keys and control keys. Maximum: One per 3251. Field installation: Yes.

LIGHT PEN (#4750). A hand-held, pen-like device which permits the operator to interact with the displayed image. Maximum: One per 3251. Field installation: Yes.

PROGRAM FUNCTION KEYBOARD (#5555). 32 keys with program controlled indicators. Maximum: One per 3251. Field installation: Yes.

Special Feature Prices:	Purchase*	MMMC
Alphanumeric Keybd #4621	\$ 495	\$ 3
Light Pen 4750	935	48
Program Function Kybd 5555	1,380	2

* Pilot Test Plan applies.



IBM 3255 DISPLAY CONTROL

Purpose: Control unit that provides common controls and attachments for up to two 3251 Display Stations.

Highlights:

- Free standing floor mounted unit attached to a 3258 Control Unit over a coaxial cable high-speed link up to 1525 m (5000 feet) in length. Supports one or two 3251s at distances of up to 15.2 m (50 feet). *Note: At least one of the 3251s must be adjacent to the 3255.*
- 32,768 byte user-programmable display buffer shared under S/370 or 4300 Processor software control among the attached 3251 Display Stations. Capability for dynamic assignment of refresh buffer to specific 3251s, under S/370 or 4300 Processor software control - such as is provided by the OS/VS1 and OS/VS2 Graphic Access Method (GAM) SCP.
- Eight light pen display buffer orders enabling the creation of display buffer programs which perform functions such as light pen track and drag, without recourse to the S/370 or 4300 Processor ... see 3251.
- Data transferred across 1M bit per second serial link between 3258 and 3255 ... maximum effective data rates approximate to 100K bytes per second, depending on message lengths.

PREREQUISITES: Control Unit - a channel attached 3258 which attaches to up to four 3255s via coaxial cable high-speed link up to 1525 m (5000 feet) long.

Bibliography: GC20-0001

Specify: [1] Power (AC, 1-phase, 3 wire, 60 Hz): For locking plug - #9880 for 115 V, #9884 for 208 V, #9886 for 230 V. For non-lock plug - #9881 for 115 V, #9885 for 208 V, #9887 for 230 V. A 3255 and its attached 3251s must all be connected to the same supply phase.

[2] Power Cable Length: If standard 4.3 meter (14 feet) is not desired, specify #9511 for 1.8 meters (6 feet).

[3] Cables: Refer to IBM 3250 Installation Manual - Physical Planning, GA33-3036.

PRICES:	Mdl	Purchase*	MMMC
3255	1	\$37,200	\$315
Warranty: B	Per Call: 3		Machine Group: A
	Useful Life Category: 2		

3258 CONTROL UNIT

Purpose: A channel control unit which supports up to four 3255 Display Control units over high-speed links up to 1525 m (5000 feet) in length. Each high-speed link is a single customer supplied coaxial cable of standard specification available from multiple sources.

Highlights:

- Free standing floor mounted unit capable of receiving data from a S/370 or 4300 Processor channel at rates of up to 250K bytes per second, transmitting data to 3255 Display Control units over 1M bit per second serial links ... maximum effective data rates approximate to 100K bytes per second, depending on message lengths.

PREREQUISITE: Channel Attachment - a control unit position on a system channel.

Processors Channel Type
3115, 3125 (no DOS/VS support for 3250) Byte Multiplexer in burst mode only

	Selector	Block Multiplexer	Selector Subchannel
3135	X	X	
3135-3, 3138, 3145-3, 3148		X	
3145	X		
3155-II, 3158		X	
3165-II, 3168	X	X	X
3031, 3032, 3033		X	
4331, 4341		X	

Bibliography: GC20-0001

Specify: [1] Power (AC, 1-phase, 3 wire, 60 Hz): For locking plug - #9880 for 115 V, #9884 for 208 V, #9886 for 230 V. For non-lock plug - #9881 for 115 V, #9885 for 208 V, #9887 for 230 V.

[2] Power Cable Length: If standard 4.3 meter (14 feet) is not desired, specify #9511 for 1.8 meter (6 feet).

[3] Cables: Cables to S/370 or 4300 Processor must be ordered. See IBM 3250 Installation Manual - Physical Planning, GA33-3036.

[4] System Attachment: identify host processor(s) by specifying the following codes:

Processor	Code	Processor	Code
3115	#9589	3158	#9587
3125	9586	3165	9584
3135	9581	3168	9588
3138	9595	3031	9599
3145	9582	3032	9588
3148	9596	3033	9597
3155	9583	4331	9606
		4341	9607

PRICES:	Mdl	Purchase*	MMMC
3258	1	\$39,750	\$345
Warranty: B	Per Call: 3		Machine Group: D
	Useful Life Category: 2		

* Pilot Test Plan applies.

IBM 3262 LINE PRINTER

Purpose: Printer output unit for the 4331 Processor at 650 lpm nominal rated speed with a 48-character set. For use with S/38, see GSD Manual.

Highlights: A general purpose optimized 64 character print belt is available ... see "Specify." The 64-character optimized belt can provide speeds up to 625 lpm. Should specific application output have unusual characteristics and not conform to the 64-character set optimized print belt, uniform print belts will provide the following nominal rated speeds:

Nominal Rated Speed	
48-character set	650 lpm
64-character set	467 lpm
96-character set	364 lpm

132 print positions are standard. Horizontal spacing is 10 characters per inch. Vertical spacing is 6 or 8 lines per inch under system control. Forms skipping and spacing are program controlled. The carriage is a single speed unit allowing skipping up to 508mm (20") per second. Continuous forms are fed by a forms tractor which accepts forms of up to a maximum of 406.4mm (16") wide. See *Forms Design Reference Guide for Printers, GA24-3488*, for forms design considerations. A 288-character Universal Character Set Buffer is standard.

Limitations:

1. Only pin fed, continuous forms can be used.
2. Both edges of the forms must be fastened in the forms tractor.
3. No staples are permitted in the areas exposed to the interchangeable print belt.
4. Printer operation and print quality vary with paper and number of copies. Forms sets of more than four parts should be tested in operating conditions to verify that results are satisfactory.
5. Maximum forms thickness is .51mm (.020").

Maximum: Up to two 3262 mdl 1s can be attached to a 4331 Processor ... see standard Display/Printer Adapter under 4331.

Prerequisite: A position on the standard Display/Printer Adapter of the 4331.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the operator. See "Customer Responsibilities" below.

Customer Set-up (CSU): The 3262 mdl 1 is designated as "Customer Set-up" thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at the customer's receiving dock, unpacking and placement of the 3262 mdl 1.
- Physical set-up, connection of cables, switch settings and checkout.
- Notifying IBM of intent to relocate and following IBM instructions for relocation.
- Using and following the problem determination procedures and filling out the trouble report prior to calling IBM for service.
- Disconnecting, packing and removal to the customer's shipping dock at time of discontinuance. Appropriate instructions will be provided by IBM.
- Replacing a worn print belt with the spare provided and rotating the platen per the instructions provided with the printer.

Supplies: A black ribbon, Part No. 7819690, or equivalent, is required.

SPECIFY

- **Voltage** (120 V AC, 1-phase, 3-wire, 60 Hz): **#9890** for locking plug, or **#9891** for non-lock plug.
- **Power Cord:** If standard 2.8 meter (9 foot) power cord is not desired, specify: **#9511** for 1.8 meter (6 foot) cord, **#9512** for 3.7 meter (12 foot) cord, or **#9513** for 4.6 meter (15 foot) cord.
- **Cabling:** **#9080** for below the floor, or **#9081** for on the floor.
- **Print Belt Character Set:** Specify one feature number for character set size and specify one feature number for character set height. When printing at 8 lpi, the 2.0mm (.079") character height is recommended. Two print belts (each with the same feature numbers) will be shipped with the printer. The second belt will be a spare for use by the customer as a back-up. When the customer installs this back-up belt, a replacement should be ordered, and the platen rotated as described in the instructions provided with the printer. The customer will be billed at the current accessory belt price. If the customer desires to have IBM Customer Engineering replace or install the print belt, the CE time involved will be billed to the customer. **Field Installation:** Available at time of manufacture only. If additional print belts are required, see "Accessories" below and "Print Belt, Additional" in the M 10000 pages.

Specify No.	Character Set Size
#9520	48-character set EBCDIC
#9522	64-character set EBCDIC
#9523	64-character set EBCDIC (optimized)
#9526*	96-character set EBCDIC

*available only with 2.4mm character height (#9950)

Specify No.	Character Set Height
#9951	2.0mm (.079")
#9950	2.4mm (.095")

- **Cables:** The customer is responsible for procurement, installation and maintenance of the coaxial signal cable. See M 10000 pages for cable prices and ordering instructions.
- **Color:** Background color is pearl white. One color accent panel must be specified. **#9060** for willow green, **#9061** for garnet rose, **#9062** for sunrise yellow, **#9063** for classic blue, **#9064** for charcoal brown, or **#9065** for pebble gray.

mdl	MRC	MLC 2 Yr	Purchase	MMMC/ AMMCR
3262 1	\$411	\$350	\$14,000	\$150

Plan Offering: Plan D Maintenance: B Per Call: 1
Purchase Option: 45% Warranty: B Useful Life Category: 2
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%
Initial Period of Maintenance Service: 3 mos.

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the Feature Number indicated below. See M 10000 pages for prices, additional information, and field installation.

Print Belt, Additional — permits the customer to obtain more than one character set print belt. Installation and replacement of these print belts is the customer's responsibility. If the customer desires to have IBM Customer Engineering replace or install the print belt, the CE time will be billed to the customer.

When ordering, indicate one feature number for character set size and one feature number for character height.

Feature No.	Character Set Size
#5940	48-character EBCDIC
#5946	64-character EBCDIC (optimized)
#5944	64-character EBCDIC
#5948 *	96-character EBCDIC

* Available only with 2.4mm character height (#5950).

Feature No.	Character Set Height
#5951	2.0 mm (.079")
#5950	2.4 mm (.095")

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3271 CONTROL UNIT Model 1 and 2

Purpose: Provides control and multiplexing capabilities for a cluster of 3277 Display Stations, 3284, 3286, 3287 Printers and 3288 Line Printers. The 3271 communicates with S/360 mdl 25, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195 or any S/370 Processor via a 2701 Data Adapter Unit, 2703 Transmission Control or, except for S/360 mdls 25 or 85, a 3704 or 3705 Communications Controller on half-duplex communications facilities using binary synchronous transmission. The 3271 communicates with the 4300 Processors via a 2701 Data Adapter Unit or a 3704 or 3705 Communications Controller, and with the 4331 Processor via the Communications Adapter. **NOTES:** (1) See the 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments. (2) 3288 mdl 2 attaches only to a 3271 mdl 2.

NOTE: For possible use with System/3, S/360 mdl 20 or 1130, see GSD Manual.

Model 1 For attachment of 3277 Display Station mdl 1s (480 characters), 3284 Printer mdl 1s, 3286 Printer mdl 1s and 3287 Printer mdl 1s and 2s. The basic unit provides attachment of up to four devices at transmission speeds of 2000 or 2400 bps. **NOTE:** One 3277 mdl 1 must be installed with the basic 3271 ... the remaining three devices may be any combination of 3277 mdl 1s, 3284 mdl 1s, 3286 mdl 1s and 3287 mdl 1s and 2s.

Model 2 For attachment of 3277 Display Station mdl 2s (1,920 characters), 3277 mdl 1s (480 characters), 3284 Printer mdl 1s and 2s, 3286 Printer mdl 1s and 2s, 3287 Printer mdl 1s and 2s, and 3288 Line Printer mdl 2s. The basic unit provides attachment of up to four devices at transmission speeds of 2000 or 2400 bps. **NOTE:** One 3277 mdl 2 must be installed with the basic 3271 ... the remaining three devices may be any combination of 3277 mdl 1s and 2s, 3284 mdl 1s and 2s, 3286 mdl 1s and 2s, 3287 mdl 1s and 2s, and 3288 mdl 2s.

Highlights: Up to thirty-two devices (3277s, 3284s, 3286s, 3287s and 3288s) may be attached in increments of four devices by adding up to seven Device Adapters (#3250) ... see "Special Features."

Efficient communications facility utilization by means of Compacted Data (blank suppression and modified data transmission), program tab, and character addressing.

The 3271 may be multidropped on the same facility with other BSC devices (1800, 2715, 2770, 2780, 3271, 3275 or 3780) as tributary stations on a multipoint line with a S/360 mdl 22-195 (except mdl 44) or any S/370 or 4300 Processor as a control station.

Communications with a S/370 mdl 115, 125, 135, 135-3, 138 can be made via the Integrated Communications Adapter (#4640) or (#1601) on the 4331 Processor and appropriate binary synchronous features on the 3115, 3125, 3135 or (#1601) on the 4331 Processor as well as via a 2701, 2703, 3704 or 3705.

Display Exception Monitoring Facility (DEMF), a software tool for network problem determination/ isolation enhances the availability and serviceability of the 3271 in BSC mode. See DEMF in the Programming/SCP sections for OS/VS1 and OS/VS2.

Communications Facilities: The 3271 operates in half-duplex mode on half-duplex facilities at transmission speeds of 1200, 2000 or 2400 bps on facilities D3, D4 or X1M via the 2701, 2703, 3704, 3705, or #4640 on 3115, 3125, 3135, 3135-3 or 3138, or (#1601) on the 4331 Processor, using binary synchronous transmission. The 3271 operates in half-duplex multipoint mode on duplex facilities at transmission speeds of 1200, 2000, 2400 or 4800 bps on facilities D3, D4, D5, X1M or X2M via the 2701, 2703, 3704, 3705, #4640 on 3115, 3125, 3135, 3135-3 or 3138, or (#1601) on the 4331 Processor, using binary synchronous transmission. Half-duplex multipoint operation on duplex facilities at 7200 bps on facility D6 is also available on the 2701, 3704, 3705, or #4640 on 3115, 3125, 3135, 3135-3 or 3138, or (#1601) on the 4331 Processor, using binary synchronous transmission. See M 2700 pages for facilities.

Modems: One IBM modem can be attached to any model of a 3271. **Prerequisite:** Transmission Speed (#7821) required for speeds over 2400 bps.

Modem	Speed (bps) (non-switched)	Modem	Speed (bps) (non-switched)
3872 mdl 1	2400	3874 mdl 1	4800/2400
3863 mdl 1	2400/1200	3864 mdl 1	4800/2400
		3875 mdl 1	7200

Switched network backup operation is available on the 3872 mdl

1, 3874 and 3875. 4-wire switched network backup operation is available on the 3863 mdl 1 and 3864 mdl 1. For communications capabilities, product utilization and special features, see M 2700, 3863, 3864, 3872, 3874, 3875 pages.

PREREQUISITES: Transmission via communications facility to a 2701, 2703, 3704, 3705, or #4640 on 3115, 3125, 3135, 3135-3, 3138 or (#1601) on 4331 Processor. See M 2700 pages.

One 3277 with keyboard must be installed on each 3271 on a model for model basis as a diagnostic aid. That is, 3277 mdl 1 on 3271 mdl 1, or 3277 mdl 2 on 3271 mdl 2.

Systems 360/370 or 4300 Processor availability will be restricted unless the using system provides sufficient core to allow diagnostic programs (OLTs) to be executed. For details associated with the required additional core sizes, see the appropriate SRL (TCAM, BTAM, and VTAM).

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Cables: Cable to attach modem must be ordered. See M 10000 pages for prices and ordering instructions for cables from 3277s, 3284s, 3286s, 3287s and 3288s. Also see 3270 Installation Manual - Physical Planning, GC27-2787.

[3] System Attachment: identify the host processor(s) by specifying the following codes;

Note: For System/3 Specify codes, see GSD manual.

Host Processor	Code	Host Processor	Code
S/360 mdl 25	#9571	S/370 mdl 138	#9595
S/360 mdl 30	9572	S/370 mdl 145, 145-3	9582
S/360 mdl 40	9573	S/370 mdl 148	9596
S/360 mdl 50	9575	S/370 mdl 155	9583
S/360 mdl 65	9576	S/370 mdl 158	9587
S/360 mdl 67	9577	S/370 mdl 165	9584
S/360 mdl 75	9578	S/370 mdl 168	9588
S/360 mdl 85	9579	3031 Processor	9599
S/360 mdl 195	9580	3032 Processor	9598
S/370 mdl 115	9589	3033 Processor	9597
S/370 mdl 125	9586	4331 Processor	9606
S/370 mdl 135, 135-3	9581	4341 Processor	9607

[4] Transmission Code: Specify one of the following; #9761 -- for EBCDIC Transmission Code (available at time of manufacture only) ... utilizes 8-bit EBCDIC code over the transmission facilities used in conjunction with EBCDIC, APL and TN characters, special feature #1066 on the 3277-2, 3284-2, 3286-2, 3287-1, 2 ... with EBCDIC Character Set (#9089) on the 3277, 3284, 3286, 3288, or EBCDIC Character Set (#9082) on the 3287-1, 2. #9762 -- for ASCII Transmission Code (available at time of manufacture only) ... utilizes 8-bit ASCII code over the transmission facilities ... used in conjunction with the ASCII Character Set (A) (#9091) or (B) (#9092) on the 3277, 3284, 3286 or 3288, or ASCII Character Set (B) (#9084) on the 3287 mdl 1 or 2.

PRICES:	Mdl	MAC/ MRC	MLC 2 yr	Purchase	MMMC
3271	1	\$ 155	\$ 132	\$4,735	\$17.50
	2	169	144	5,240	19.50

Plan Offering: Plan B Purchase Option: 60% Machine Group: A
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From	To	2	11	12
1		\$ 694	\$2,505	\$3,200
2				2,505

Notes: An RPQ must be requested if the ASCII code is required on the model 11 or 12. The Data Analysis-APL Feature is precluded from ASCII controllers.

SPECIAL FEATURES

DATA ANALYSIS-APL FEATURE (#1066). [mdl 2 only] Accommodates APL characters and TN train (see Type Catalog, S/370 Printers) characters. These, in addition to EBCDIC (dual case only) characters, may be transmitted between either S/370 or 4300 Processors and selected I/O units of the 3270 System. **Field Installation:** Yes.



3271 Control Unit Mdl 1 and 2 (cont'd)

COPY (#1550). Provides the ability to transfer the complete contents of the storage buffer of one device into the storage buffer of a second device ... either display or printer. These devices must share a common control unit. **Field Installation:** Yes.

DEVICE ADAPTER (#3250). Each permits the addition of four devices (3277s, 3284s, 3286s, 3287s, 3288s in any combination). **Maximum:** Seven ... for a maximum of 32 attached devices. **Field Installation:** Yes.

TRANSMISSION SPEED (#7820, 7821). #7820 -- for transmitting over communications facilities at 1200 bps. #7821 -- for transmitting at speeds of 4800 or 7200 bps. Clocking provided by modem. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	MLC 2yr	Purchase	MMMC	
Data Analysis-APL Fea	#1066	\$ 42	\$ 36	\$ 630	\$1.50
Copy	1550	NC	NC	NC	NC
Device Adapter	3250	51	43	779	.50
Transmission Speed					
- 1200 bps	7820	NC	NC	NC	NC
- 4800/7200 bps	7821	4	3	145	.50

3271 CONTROL UNIT Model 11 and 12 (Remote Attachment)

Purpose: Provides control and multiplexing capabilities for a cluster of 3277 Display Stations, 3284, 3286, 3287 Printers, and 3288 Line Printers. The 3271 mdls 11 and 12 communicate with any S/370 or 4300 Processor via a 3704 or 3705 Communications Controller (or via the Communications Adapter feature on the 4331. **NOTE:** These units are not supported by ACF/VTAME.) on half duplex or duplex communications facilities using Synchronous Data Link Control (SDLC) transmission.

NOTE: See the 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

Model 11 For attachment of 3277 Display Station mdl 1s (480 characters), 3284 Printer mdl 1s, 3286 Printer mdl 1s and 3287 Printer mdl 1s and 2s. The basic unit provides attachment of up to four devices and will transmit EBCDIC transmission code at line speeds of 2000 to 9600 bps. **NOTE:** One 3277 mdl 1 must be installed with the basic 3271 mdl 11. The remaining three devices may be any combination of 3277 mdl 1s, 3284 mdl 1s, 3286 mdl 1s and 3287 mdl 1s and 2s.

Model 12 For attachment of 3277 Display Station mdl 2s (1,920 characters), 3277 mdl 1s (480 characters), 3284 Printer mdl 1s and 2s, 3286 Printer mdl 1s and 2s, 3287 Printer mdl 1s and 2s, and 3288 Line Printer mdl 2s. The basic unit provides attachment of up to four devices and will transmit EBCDIC code at line speeds of 2000 to 9600 bps. **NOTE:** One 3277 mdl 2 must be installed with the basic 3271 mdl 12. The remaining three devices may be any combination of 3277 mdl 1s and 2s, 3284 mdl 1s and 2s, 3286 mdl 1s and 2s, 3287 mdl 1s and 2s, and 3288 mdl 2s.

Highlights: Up to thirty-two devices (3277s, 3284s, 3286s, 3287s, 3288s) may be attached in increments of four devices by adding up to seven Device Adapters (#3250) ... see "Special Features."

Efficient communications facility utilization by means of Compacted Data (blank suppression and modified data transmission), program tab, character addressing, and Copy Command (transfer of the contents of the storage buffer of one device to another device).

The 3271 mdls 11 and 12 may be multidropped on the same communications facility with other SDLC devices on a multipoint or a duplex-multipoint line with any S/370 or 4300 Processor as a control station.

Communications Facilities: The 3271 mdls 11 and 12 operate in half-duplex multipoint mode on half-duplex facilities at transmission speeds of 1200, 2000 or 2400 bps via the 3704, 3705 or Communications Adapter on 4331 Processor using SDLC transmission. The 3271 mdls 11 and 12 operate in half-duplex multipoint or duplex multipoint mode on duplex facilities at transmission speeds of 1200, 2000, 2400, 4800, 7200 or 9600 bps via the 3704, 3705 or Communications Adapter on 4331 Processor using SDLC transmission. See M 2700 and M 3704/3705 and 4331 pages.

Modems: One IBM modem can be attached to any model 3271.

Modem	Speed (bps) (non-switched)	Modem	Speed (bps) (non-switched)
3863 mdl 1	2400/1200	3874 mdl 1	4800
3864 mdl 1	4800/2400	3875 mdl 1	7200
3872 mdl 1	2400	3865 mdl 1/2	9600/4800

Manual switched network backup is available on the 3872, 3874 and 3875. 4-wire switched network backup operation is available on the 3863 mdl 1, 3864 mdl 1 and 3865 mdls 1 and 2. For communications capabilities, product utilization and special features, see M 2700, 3863, 3864, 3865, 3872, 3874 and 3875 pages.

PREREQUISITES: (1) Transmission via communications facility to a 3704, 3705 or Communications Adapter on 4331 Processor requires a modem. Clocking for 1200 bps is provided by the 3271. Clocking above 1200 bps is provided by the modem ... (2) As a diagnostic aid, one 3277 mdl 1 with keyboard or one 3277 mdl 2 with keyboard must be installed on a 3271 mdl 11 or on a 3271 mdl 12 respectively.

Bibliography: See KWIC index, G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Cables: Cable to attach modem must be ordered. See M 10000 pages for prices and ordering instructions for cables from 3277s, 3284s, 3286s, 3287s and 3288s. Also see 3270 Installation Manual - Physical Planning, GA27-2787.

[3] System Attachment: For record purposes, identify the Host Processor(s) specifying the following:

Host Processor	Code	Host Processor	Code
S/370 mdl 115	#9589	S/370 mdl 165 II	#9584
S/370 mdl 125	9586	S/370 mdl 168, 168MP	9588
S/370 mdl 135, 135-3	9581	3031 Processor	9599
S/370 mdl 138	9595	3032 Processor	9598
S/370 mdl 145, 145-3	9582	3033 Processor	9597
S/370 mdl 148	9596	4331 Processor	9606
S/370 mdl 155 II	9583	4341 Processor	9607
S/370 mdl 158, 158 MP	9587		

PRICES:	Mdl	MAC/ MRC	MLC 2 yr	Purchase	MMMC
3271	11	\$224	\$191	\$6,440	\$46.50
	12	239	203	6,945	49.50

Plan Offering: Plan B Purchase Option: 60% Machine Group: A
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent; 5%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model 11 to Model 12 \$ 694

SPECIAL FEATURES

DATA ANALYSIS-APL FEATURE (#1066). [Mdl 12 only] Accommodates APL characters and TN train (see Type Catalog, S/370 Printers) characters. These, in addition to EBCDIC (dual case only) characters, may be transmitted between S/370 or 4300 Processor and selected I/O units of the 3270 System. **Field Installation:** Yes. **Note:** The Data Analysis-APL Feature is precluded from ASCII controllers.

ASCII TRANSMISSION CODE (#1200). Utilizes 8-bit ASCII code over transmission facilities. Used in conjunction with ASCII Character Set (A) (#9091) or ASCII Character Set (B) (#9092) on the 3277, 3284, 3286, 3288, or ASCII Character Set (B) (#9084) on the 3287. **Field Installation:** Available at time of manufacture only.

DEVICE ADAPTER (#3250). Each permits the addition of four devices (3277s, 3284s, 3286s, 3287s, 3288s in any combination). **Maximum:** Seven ... for a maximum of 32 attached devices. **Field Installation:** Yes.

TRANSMISSION SPEED - 1200 BPS (#7820). For transmitting over communications facilities at 1200 bps. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	MLC 2 yr	Purch	MMMC	
Data Analysis-APL Fea	#1066	\$ 42	\$ 36	\$ 630	\$1.50
ASCII Transmission Code	1200	8	7	286	.50
Device Adapter	3250	51	43	779	.50
Trans Speed - 1200 bps	7820	NC	NC	NC	NC

**IBM 3272 CONTROL UNIT**
[Local Attachment]

Purpose: Provides the controls and multiplexing capabilities for a cluster of 3277 Display Stations, 3284, 3286 and 3287 Printers, and 3288 Line Printers. The 3272 attaches to a S/360 mdl 25, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195; or any S/370 Processor via a multiplexer, selector, or block multiplexer channel; or any 4300 Processor via a byte multiplexer or block multiplexer channel. **NOTES:** (1) 3288 mdl 2 attaches only to a 3272 mdl 2 ... (2) Attachment to a non DCC subchannel of a block multiplexer channel or to a selector channel is not recommended due to performance considerations which may yield less than maximum throughput.

Model 1 For attachment of 3277 Display Station mdl 1s (480 characters), 3284 Printer mdl 1s, 3286 Printer mdl 1s and 3287 Printer mdl 1s and 2s. The basic unit provides for attachment of up to four devices at a data transfer rate of up to 650,000 characters/second. **NOTE:** One 3277 mdl 1 must be installed with the basic 3272 ... the remaining three devices may be any combination of 3277 mdl 1s and 3284 mdl 1s, 3286 mdl 1s and 3287 mdl 1s and 2s.

Model 2 For attachment of 3277 Display Station mdl 2s (1,920 characters), 3277 mdl 1s (480 characters), 3284 and 3286 Printer mdl 1s and 2s, 3287 mdl 1s and 2s, and 3288 Line Printer mdl 2s. The basic unit provides for attachment of up to four devices at a data transfer rate of up to 650,000 characters/second. **NOTE:** One 3277 mdl 2 must be installed with the basic 3272 ... the remaining three devices may be any combination of 3277 mdl 1s and 2s, 3284 and 3286 mdl 1s and 2s, 3287 mdl 1s and 2s, and 3288 mdl 2s.

Highlights: Up to thirty-two devices (3277s, 3284s, 3286s, 3287s, 3288s) may be attached in increments of four devices by adding up to seven Device Adapters (#3250) ... see "Special Features."

Basic features include Compacted Data (blank suppression and modified data transmission), program tab, and character addressing.

Display Exception Monitoring Facility (DEMF), a software tool for network problem determination/isolation enhances the availability and serviceability of the 3272 in BSC mode. See DEMF in the Programming/SCP sections for OS/VS1 and OS/VS2.

PREREQUISITES: One 3277 with keyboard must be installed on each 3272 on a model for model basis, as a diagnostic aid. That is, 3277 mdl 1 on 3272 mdl 1, or 3277 mdl 2 on 3272 mdl 2.

Each 3272 requires a control unit position on a system channel.

S/360 mdl 25 -- special feature on 2025; Multiplexer Channel or Selector Channel ... see 2025.

S/360 mdl 30, 40, 50 -- multiplexer channel (standard), or Selector Channel (special feature) ... see 2030, 2040, 2050.

S/360 mdl 65, 67, 75 -- selector channel of a 2860, basic multiplexer channel of a 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 85, 195 or S/370 mdl 165, 168, 195 -- selector channel of a 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) of 2870, block multiplexer channel of 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135, 135-3, 138, 145, 145-3, 148, 155, 158 -- byte multiplexer channel, block multiplexer channel, selector channel ... see 3135, 3135-3, 3138, 3145, 3145-3, 3148, 3155, 3158.

3031, 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channel (five are standard) ... see 3031, 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- Byte Multiplexer Channel (one is optional), Block Multiplexer Channel (one is optional). See M 4331 pages.

4341 Processor -- Byte Multiplexer Channel (one is standard), Block Multiplexer Channel (two are standard). See M 4341 pages.

Systems 360/370 or 4300 Processor availability will be restricted unless the using system provides sufficient core to allow diagnostic programs (OLTs) to be executed. For details associated with the required additional core sizes, see the appropriate SRL (TCAM, BTAM and VTAM).

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9885 for 208 V, or #9887 for 230 V. Must be consistent with system voltage.

[2] Cables: Cables to S/360, S/370 or 4300 Processors must be ordered. See M 10000 pages for prices and ordering instructions for cables from 3277s, 3284s, 3286s, 3287s and 3288s. Also see 3270 *Installation Manual - Physical Planning*, GA27-2787.

[3] System Attachment: identify host processor(s) by specifying the following codes;

Host Processor	Code	Host Processor	Code
S/360 mdl 25	#9571	S/370 mdl 135, 135-3	#9581
S/360 mdl 30	9572	S/370 mdl 138	9595
S/360 mdl 40	9573	S/370 mdl 145, 145-3	9582
S/360 mdl 50	9575	S/370 mdl 148	9596
S/360 mdl 65	9576	S/370 mdl 155	9583
S/360 mdl 67	9577	S/370 mdl 158	9587
S/360 mdl 75	9578	S/370 mdl 165	9584
S/360 mdl 85	9579	S/370 mdl 168	9588
S/360 mdl 195	9580	3031 Processor	9599
S/370 mdl 115	9589	3032 Processor	9598
S/370 mdl 125	9586	3033 Processor	9597
		4331 Processor	9606
		4341 Processor	9607

[4] Operator Console Use: [Mdl 2 only] For record purposes only use. #9480 -- if one 3277 mdl 2 is used as a system operator console, or #9481 -- if no system operator console is required for the 3272.

PRICES:	Mdl	MAC/ MRC	MLC 2 yr	Purchase	MMMC
3272	1	\$179	\$152	\$5,465	\$17.50
	2	193	164	5,970	39.00

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 60% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 1 to Model 2 \$694

SPECIAL FEATURES

DATA ANALYSIS-APL FEATURE (#1066). [mdl 2 only] Accommodates APL characters and TN train (see Type Catalog, S/370 Printers) characters. These, in addition to EBCDIC (dual case only) characters, may be transmitted between S/370 or 4300 Processor and selected I/O units of the 3270 System. **Field Installation:** Yes.

DEVICE ADAPTER (#3250). Each permits the addition of four devices (3277s, 3284s, 3286s, 3287s, 3288s in any combination). **Maximum:** Seven ... for a maximum of 32 attached devices. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	MLC 2 yr	Purch	MMMC	
Data Analysis-APL Fea	#1066	\$ 42	\$ 36	\$ 630	\$2.50
Device Adapter	3250	51	43	779	.50

IBM 3274 CONTROL UNIT

Purpose: Provides the capability of controlling up to a maximum cluster of thirty-two terminals consisting of display stations, serial matrix printers and/or line printers. Two categories of terminal adapters are used in attaching the desired displays or printers ... see terminal attachment list below. The basic 3274 Control Unit allows attachment of up to eight Category A terminals. The two categories of terminal adapters can be featured in various combinations to provide the maximum terminal configuration of 32 terminals (a maximum of 16 of the 32 terminals can be Category B units and at least one Category A Display Station with keyboard is needed for diagnostic purposes). The 3274 has one model for communicating in data half duplex mode via half duplex or duplex communications facilities and three models for local channel attachment.

Note: For use with System/3, see GSD Manual.

ATTACHABLE TERMINALS
Category A Terminals

3278 mdl 1, 2, 3, 4, 5*	Display Station
3287 mdl 1, 2	Printer
3289 mdl 1, 2	Line Printer

Category B Terminals

3277 mdl 1, 2	Display Station
3284 mdl 1, 2	Printer
3286 mdl 1, 2	Printer
3287 mdl 1, 2	Printer
3288 mdl 2	Line Printer

* Model 5 cannot attach to a 3274 mdl 1B.

Model 1A -- for local (SNA version) attachment, via a byte multiplexer, selector or *block multiplexer channel, to S/370 mdls 115 through 168 MP, 3031, 3032 and 3033 Processors, or any 4300 Processor via a byte multiplexer or block multiplexer channel.

Model 1B -- for local (3272 version) attachment, via a byte multiplexer, selector, or *block multiplexer channel, to S/370 mdls 115 through 195, a 3031, 3032 or 3033 Processor, S/360 mdls 30, 40, 50, 65, 75 and 195, or any 4300 Processor via a byte multiplexer or block multiplexer channel.

Note: *Attachment to a non DCC subchannel of a block multiplexer channel or to a selector channel is not recommended due to performance considerations which may yield less than maximum throughput.

Model 1C -- for communicating in data half duplex mode over half duplex or duplex communication facilities with the following:

S/370 mdls 115 through 168 MP and 3031, 3032, 3033 or 4300 Processors -- via 3704 or 3705 Communications Controller (or the Communications Adapter feature on the 4331. Note: These units are not supported by ACF/VTAME.) using Synchronous Data Link Control (SDLC/SNA).

S/370 mdls 115 through 195 and 3031, 3032, 3033 or 4300 Processors -- via (where applicable) a 2701 Data Adapter Unit, 2703 Transmission Control, a 3704 or 3705 Communications Controller, or a Communications Adapter feature on the 4331, using Binary Synchronous Communications (BSC).

S/370 mdls 115, 125, 135 and 138 -- via an Integrated Communications Adapter (ICA) using Binary Synchronous Communications (BSC).

S/360 mdls 30, 40, 50, 65, 75 and 195 -- via a 2701 Data Adapter Unit, 2703 Transmission Control, 3704 or 3705 Communications Controller using Binary Synchronous Communications (BSC).

Model 1D -- for local (3272 version) attachment, via a byte multiplexer, selector or *block multiplexer channel, to virtual storage S/370 models 115 thru 168MP, 3031, 3032 and 3033 Processor, or any 4300 Processor via a byte multiplexer or block multiplexer channel.

* **Note:** Attachment to a non-DCC subchannel of a block multiplexer channel or to a selector channel is not recommended due to performance considerations which may yield less than maximum throughput.

Highlights: The 3274 Control Unit is a terminal control unit which can attach up to thirty-two displays, serial matrix printers and/or line printers. These terminals are grouped into two categories. The Category A terminals are a display and printers which were developed for attachment to the 3274 Control Unit, while the Category B terminals were designed for attachment to the 3271 and 3272 Control Units. The 3274 Control Unit was designed to attach the Category B terminals with certain limitations. A maximum of sixteen of the thirty-two attachable terminals can be Category B terminals. Category A terminals can be driven up to a maximum of 1500 meters (4920 feet), while Category B terminals can only be

driven a maximum of 610 meters (2000 feet). Both categories of terminals attach to their respective Terminal Adapter by the same type coaxial cable and connectors which are used between a 3271 or 3272 Control Unit and its display or printer terminals.

The 3274 can communicate with a S/360, S/370 or 4300 Processors by local channel attach or remotely via communications facilities. The channel attached control unit is available in three models: Model 1A for SNA operation with extended data stream handling capabilities, model 1B for 3272 operation, and model 1D for 3272 operation with extended data stream handling capabilities. The model 1C can operate with extended data stream handling capabilities as either a Binary Synchronous Communications 3271 or as an SNA/SDLC unit. One feature diskette and two systems diskettes are shipped with each 3274. An Encrypt/Decrypt feature diskette is also shipped with the Encrypt/Decrypt (#3680) feature on a 3274 mdl 1C.

The flexibility of 3274 Control Units enables the user to configure a display sub-system for initial requirements, and later change hardware and functions to meet future needs. Function configurability is attained through a Configuration Support option via feature and system diskettes.

As part of the installation procedure, a customized system diskette is generated. The generation process is accomplished by the customer keying in system configuration parameters. A unique configuration table is written on the system diskette along with the necessary control code to accomplish the functions. For example, during subsequent control unit loading or initialization of a Model 1C, BSC or SNA/SDLC mode of operation is determined by the configuration recorded on the system diskette used. It is possible to create two different system diskettes; one to be used for BSC (3271 compatible) operation and the other to be used when operating SNA/SDLC.

The control unit is initialized with control code and configuration parameters as a result of Power On or by pressing the IML push-button. The load occurs from an integrated diskette drive using the previously customized system diskette. The loading process starts with the execution of extended tests contained on the diskette.

The character set to be used on attached terminals is specified on the customized IML diskette during installation procedure. All attached terminals must have the same character set. Either EBCDIC or ASCII transmission code may be selected when customizing a diskette for a 3274 mdl 1C that will employ the BSC mode of operation. ASCII support of the data bytes in Function Management Data Request/Response Units may be selected when customizing diskettes for 3274 mdl 1C, for all 3270 data streams (except SCS and APL/Text applications). ASCII support (BSC) is provided to correspond with the transmission code that is used by the central processing system.

Detail information for initial customizing, for customizing made necessary by changing configurations, and for optionally updating the diskettes, is contained in the *IBM 3270 Information Display System, IBM 3274 Control Unit Planning, Setup, and Customizing Guide, GA27-2827*.

Communications: The 3274 mdl 1C communicates with a S/370 or 4300 Processor using Synchronous Data Link Control (SDLC) over full or half duplex communications facilities to a 3704/3705 Communications Controller (or via the Communications Adapter feature on the 4331. Note: These units are not supported by ACF/VTAME); or by Binary Synchronous Communication to a S/360, S/370 or 4300 Processors over duplex or half duplex communications facilities via (where applicable) a 2701 Data Adapter Unit, 2703 Transmission Control, or a 3704/3705 Communications Controller.

Communications with a S/370 mdl 115, 125, 135 or 138 can also be via the Integrated Communications Adapter (#4640) and appropriate binary synchronous features on the 3115, 3125, 3135 or 3138. Communications with a 4331 Processor can be via the Communications Adapter (#1601) using BSC or SDLC/SNA protocols.

Communications Facilities: The 3274 mdl 1C operates in half duplex point-to-point or multipoint mode on half duplex or duplex facilities at transmission speeds of 2000, 2400, 4800, 7200 and 9600 bps on non-switched facilities D4, D4M, D4SB, D5, D5M, D5SB, D6, D6M, D6SB, D7, D7M, D7SB, X1, X1M, X2, X2M, X3 and X3M. See M 2700 pages for facilities.

Modems: Unless a DDS Adapter (#5650 or #5651) is installed in a 3274 mdl 1C, an external modem with its own clocking must be attached to a 3274 mdl 1C with the External Modem Interface (#3701) and either Common Communications Adapter (#6302) or High Performance Communications Adapter (#6303) installed.

3274 Control Unit (cont'd)

IBM Modems	Speed (bps)
3863 mdl 1	2400/1200
3864 mdl 1	4800/2400
3865 mdl 1, 2	9600/4800
3872 mdl 1	2400/1200
3874 mdl 1	4800/2400
3875 mdl 1	7200/3600

4 wire switched network backup is available on 3863, 3864 and 3865 modems with auto answer. Switched network backup operation with Manual Call and Manual or Auto Answer is available on the 3872 mdl 1, 3874 mdl 1 and 3875 mdl 1. For communications capabilities, product utilization and features, see M 2700 and M 3863, 3864, 3865, 3872, 3874 and 3875 pages.

Problem Determination Procedure: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the operator. See "Customer Responsibilities" below.

Display Exception Monitoring Facility (DEMF), a software tool for network problem determination/isolation enhances the availability and serviceability of the 3274 in BSC mode. See DEMF in the Programming/SCP sections for OS/VS1 and OS/VS2.

Installation and Customer Set-Up (CSU): The 3274 mdl 1C is designated as Customer Set-Up, thereby offering the customer early availability and terminal relocation flexibility. The customer is responsible for performing the required 3274 customization and attaching CSU units to the 3274.

Customer Responsibilities:

The customer is responsible for:

Adequate site, system and other vendor preparation.

Physical setup, connection of cables to TP lines/modems and IBM devices incorporating protected customer access areas, switch settings, and checkout.

Contact IBM Field Engineering to make cable connections of IBM CSU units to IBM non CSU units where customer access areas are not provided.

Notify IBM of intent to relocate and follow IBM instructions for relocation.

Use and follow the problem determination procedures and fill out the trouble report prior to calling for IBM service.

Disconnecting, packing and removal to the customer's shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.

Receipt at the customer's receiving dock, unpacking, and placement of the 3274.

Contacting IBM Field Engineering to accomplish the channel connection tasks ... for the 3274 mdl 1A, 1B or 1D.

Connection of communication cable to the communication facility for the 3274 mdl 1C.

Performing 3274 Control Unit Customization in accordance with IBM supplied procedures.

- For initial installation.
- When made necessary by changes in configuration.
- Updating of the control unit diskettes (at the customer's option).

Prerequisites: [1] One 3278 Display Station with keyboard is needed on each 3274 as a diagnostic aid. It must be attached to the first terminal address on the control unit (Port 0) ... [2] For a model 1C, External Modem Interface (#3701) or DDS Adapter (#5650 or #5651) must be ordered along with either Common Communications Adapter (#6302) or High Performance Communications Adapter (#6303) ... see "Special Features." Either an IBM or non-IBM external modem, with its own clocking, must be provided.

Bibliography: See applicable KWIC Index listed below, or specific system bibliography.

- 3274 Model 1A -- G320-1621
- 3274 Model 1B -- GC20-0360 (S/360)
- 3274 Model 1B -- GC20-0001 (S/370)
- 3274 Model 1C -- GC20-0001
- 3274 Model 1D -- GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking Plug -- #9890 for 120 V (Mdl 1C only), #9884 for 208 V, or #9894 for 240 V. Non-lock Plug -- #9891 for 120 V (Mdl 1C only), #9885 for 208 V, or #9895 for 240 V. For Watertight Connector, see "Special Features."

[2] Power Cable Length: If standard 4.3 meter (14 feet) power

cable is not desired, specify #9511 for 1.8 meters (6 feet).

[3] Communication Cable: (Mdl 1C only) If the standard 6.1 meter (20 feet) communication cable is not desired, specify one of the following: #9061 for 3.0 meters (10 feet), #9062 for 9.1 meters (30 feet), or #9063 for 12.2 meters (40 feet).

[4] Configuration Support: The Configuration Support required for the 3274 must be determined before ordering special features or attaching certain terminals. Refer to the 3274 Control Storage Requirement Tables under special feature Extended Function Store (EFS) for a detailed listing of the functions supported by each option. **Limitation:** Certain functions require host software support in order to be utilized. Refer to host programming support descriptions to determine the levels of software required. **Field Installation:** Yes.

Configuration Support A: This Configuration Support is shipped with all 3274s unless Configuration Support B (#9111) is specified. It provides support for all 3270 functions listed in Table 1 (see Extended Function Store (EFS) under Special Features), plus support of solicitation of summary maintenance statistics from a 3274 mdl 1C with SNA/SDLC IML, through the use of Network Problem Determination Application (NPDA).

Configuration Support B (#9111) [Mdl 1A, 1C and 1D only] Provides support for all 3270 functions included in Configuration Support A plus the ability to attach 3278 mdl 5 displays, and support for the following functions:

- Pacing of inbound message traffic (mdls 1A and 1C/SNA).
- Automatic session recovery in both single and multidomain networks (mdl 1C/SNA).
- Host notification of changes in the power on/off status at attached terminals (mdls 1A and 1C/SNA).

Specify #9111 for Configuration Support B.

[5] Operational Mode: [Mdl 1C only] Specify #9433 if the control unit will use SNA/SDLC IML. (Record purposes only/order verification.)

[6] Alternate Mailing Address: #9011 ... for diskette only updates. Order this optional feature to specify that diskette only updates are to be mailed to an alternate site address

using a Teleprocessing Control number (TPC) rather than to the address of the 3274 Control Unit installation site. The alternate address selected is usually that of a central site location. Redistribution of the diskettes containing the diskette update is the responsibility of the customer. The user may decide to replace the existing diskette himself with the diskette containing the updates or, if requested, the IBM Customer Engineer will replace the diskette. The purpose of this feature is to assist the customer with his network management. **Field Installation:** Yes.

PRICES: Mdl	MRC	MLC 2 Yr	Purchase	MMMM
3274 1A	\$490	\$417	\$18,770	\$83
1B	490	417	18,770	87
1C	344	293	13,190	70
1D	490	417	18,770	92

Plan Offering: Plan B Machine Group: A Per Call: 1
Warranty: B Purchase Option: 55%
Termination Chg Months: 5 Termination Chg Percent: 25%
Upper Limit Percent: 5% Useful Life Category: 2

Model Changes: Any local channel interface - SNA (model 1A), or 3272 compatible (model 1B), or 3272 version with expanded character handling capability (model 1D) can be converted to one of the others. Model 1C to model 1A, 1B or 1D or vice versa is not field installable..

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From To	1A	1B	1D
1A	—	\$1,310	\$1,210
1B	\$ 830	—	700
1D	830	800	—

SPECIAL FEATURES

Note: Some combinations of functions and features may exceed the capacity of the control storage in the basic machine. After the Configuration Support and the desired special features have been selected, the control storage requirement must be determined by using the tables under Extended Function Store features.

CONTROL STORAGE EXPANSION (#1801). [Mdl 1A, 1C, 1D only] Provides the ability to install storage above the basic level. This feature must be installed with Extended Function Store Type C1 (#3622). This combination is also a prerequisite to installing the other Extended Function Store features [Type C3 (#3625),

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Type D1 (#3627)]. **Maximum: One. Field Installation: Yes.**

EXTENDED FUNCTION STORE (EFS) Type C1 (#3622), Type C3 (#3625), Type D1 (#3627). Provides increments of control storage to accommodate combinations of functional features which exceed the storage capacity of the basic machine. Types C1, C3 and D1 (#3622, 3625, 3627) each provide increments of 16,384 bytes. To determine which Extended Function Store features may be required, refer to the 3274 Control Storage Requirement Tables 1 and 2 below.

Note: A description of non-"Specify", non-"Feature" and non-"Machine" Control Storage Requirement Functions is given later in this section, with the exception of "Category A Terminals", "Category B Terminals", EBCDIC and ASCII, which have been described above.

3274 CONTROL STORAGE REQUIREMENT TABLES

Configuration flexibility is provided through two Configuration Support options.

STEP #1: Determine which Configuration Support contains the functions desired.

STEP #2: After determining the desired Configuration Support, select the applicable part of Table 1 (Part 1, 2, 3 or 4) to determine the Type C and Type D storage requirements for the 3274 models 1A, 1C/SNA, 1C/BSC, or 1D respectively.

STEP #3: Total the Type C and Type D storage requirements determined in Step #2.

STEP #4: With the total 3274 storage requirements found in Step #3, use Table 2 to determine if the base 3274 storage is adequate or if additional storage must be ordered. If additional storage is required, Table 2 will show which Extended Function Store (EFS) type feature(s) must be ordered.

Table 1 - Part 1

3274 MODEL 1A	TYPE C	TYPE D
Model 1A Base (including copy)		
Configuration Support A	41,200	13,600
Configuration Support B (#9111)	45,072	14,484
Category B Terminals	4,900	4,600
APL/Text Control Function	1,700	1,200
3289 Text Print Control	0	512
Host Loadable Printer Authorization Matrix	500	0
Between Bracket Printer Sharing	800	100
SCS Printer Support (3287-#9660)	1,600	100
Magnetic Reader Control (3278-#4999) 3275/3277 Like 10-Character Set Numeric & Alphameric Character Sets	600 1,630	60 316
Keyboards	0	0
Typewriter(1) (3278-#4621, #4624, #4627, #4628)	0	786
Data Entry(1) (3278-#4622)	0	786
Data Entry KP(1) (3278-#4623)	0	786
Text (3278-#4629)	0	1,560
APL (3278-#4626)	0	1,560
Add'l Category A Terminals (8 included in base)		Type D
9 to 16 total category A terminals		2,048
17 to 24 total category A terminals		4,096
25 to 32 total category A terminals		6,144
Category B Terminals (3)		Type D
1 to 4 category B terminals		1,024
5 to 8 category B terminals		2,048
9 to 12 category B terminals		3,072
13 to 16 category B terminals		4,096

Table 1 - Part 2

3274 MODEL 1C/SNA	TYPE C	TYPE D
Model 1C/SNA EBCDIC (including Copy)		
Configuration Support A	41,030	13,700
Configuration Support B (#9111)	46,102	15,096
Model 1C/SNA ASCII (including Copy)		
Configuration Support A	41,446	14,100
Configuration Support B (#9111)	46,518	15,496
Category B Terminals	4,900	4,600
APL/Text Control Function	1,700	1,200
3289 Text Print Control	0	512
High Performance Communications Adapter (#6303)	600	-500
Host Loadable Printer Authorization Matrix	500	0
Between Bracket Printer Sharing	800	100
SCS Printer Support (3287-#9660)	1,600	100
Magnetic Reader Control (3278-#4999) 3275/3277 Like 10-Character Set Numeric & Alphameric Character Sets	600 1,630	60 316
Encrypt/Decrypt (#3680)	3,200	900
Keyboards	0	0
Typewriter(1) (3278-#4621, #4624, #4627, #4628)	0	786
Data Entry(1) (3278-#4622)	0	786
Data Entry KP(1) (3278-#4623)	0	786
Text (3278-#4629)	0	1,560
APL (3278-#4626)	0	1,560
Add'l Category A Terminals (8 included in base)		Type D
9 to 16 total category A terminals		2,048
17 to 24 total category A terminals		4,096
25 to 32 total category A terminals		6,144
Category B Terminals (3)		Type D
1 to 4 category B terminals		1,024
5 to 8 category B terminals		2,048
9 to 12 category B terminals		3,072
13 to 16 category B terminals		4,096

Table 1 - Part 3

3274 MODEL 1C/BSC	TYPE C	TYPE D
Model 1C/BSC EBCDIC		
Configuration Support A	38,000	13,800
Configuration Support B (#9111)	41,872	14,684
Model 1C/BSC ASCII		
Configuration Support A	38,000	14,500
Configuration Support B (#9111)	41,872	15,384
Category B Terminals	4,700	700
APL/Text Control Function	2,200	4,700
Copy (Print Key Function)	2,700	0
3289 Text Print Control	0	512
Host Loadable Printer Authorization Matrix	550	0
Magnetic Reader Control (3278-#4999) 3275/3277 Like 10-Character Set Numeric & Alphameric Character Sets	600 1,120	60 316
Keyboards	0	0
Typewriter(1) (3278-#4621, #4624, #4627, #4628)	0	786
Data Entry(1) (3278-#4622)	0	786
Data Entry KP(1) (3278-#4623)	0	786
Text (3278-#4629)	0	1,560
APL (3278-#4626)	0	1,560
Add'l Category A Terminals (8 included in base)		TYPE D
9 to 16 total category A terminals		2,048
17 to 24 total category A terminals		4,096
25 to 32 total category A terminals		6,144
Category B Terminals (3)		TYPE D
1 to 4 category B terminals		1,024
5 to 8 category B terminals		2,048
9 to 12 category B terminals		3,072
13 to 16 category B terminals		4,096

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Table 1 - Part 4

3274 MODEL 1D	TYPE C	TYPE D
Model 1D		
Configuration Support A	34,500	17,000
Configuration Support B (#9111)	38,372	17,884
Category B Terminals	4,300	2,700
APL/Text Control Function	1,700	4,600
Copy (Print Key Function)	2,700	0
3289 Text Print Control	0	512
Host Loadable Printer Authorization Matrix	550	0
Magnetic Reader Control (3278-#4999) 3275/3277 Like 10-Character Set Numeric & Alphameric Character Sets	600 1,120	60 316
Keyboards	0	0
Typewriter(1) (3278-#4621, #4624, #4627, #4628)	0	786
Data Entry(1) (3278-#4622)	0	786
Data Entry KP(1) (3278-#4623)	0	786
Text (3278-#4629)	0	1,560
APL (3278-#4626)	0	1,560
Add'l Category A Terminals (8 included in base)		TYPE D
9 to 16 total category A terminals		2,048
17 to 24 total category A terminals		4,096
25 to 32 total category A terminals		6,144
Category B Terminals (3)		TYPE D
1 to 4 category B terminals		1,024
5 to 8 category B terminals		2,048
9 to 12 category B terminals		3,072
13 to 16 category B terminals		4,096

- (1) (Configuration Support A restriction only) Only two of the three keyboard types (Typewriter, Data Entry or Data Entry-Keypunch like) can be supported at any one time on displays attached to a 3274 Control Unit. Text and APL keyboards are not affected by this limitation and can be installed with any of the other keyboards without restriction.
- (2) If the total Type D requested for Category A and Category B terminals exceeds 6,144, use 6,144.
- (3) There is no customizing option nor additional control storage required to support 10 Numeric only Character Set for Operator Identification Card Reader (#4600) on 3277 Display Stations (Category B terminals) which are attached to a 3274.

Table 2

FACTORS	SIZE	FEATURE CODES
Type C + Type D	≤65,536	None
Type C + Type D and Type C and Type D	>65,536 ≤49,152 ≤32,768	#1801 and #3622
Type C + Type D and Type C and Type D	>65,536 ≤49,152 ≤32,768	#1801, #3622 and #3625
Type C + Type D and Type C and Type D	>65,536 ≤49,152 ≤32,768	#1801, #3622 and #3627
Type C + Type D and Type C and Type D	>65,536 >49,152 >32,768	#1801, #3622, #3625 and #3627

EFS-Type C1 (#3622): [Mdl 1A, 1C, 1D only] **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Control Storage Expansion (#1801) must be installed with this feature.

EFS-Type C3 (#3625): [Mdl 1A, 1C, 1D only] **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Control Storage Expansion (#1801) and Extended Function Store Type C1 (#3622) must be installed before this feature can be installed.

EFS-Type D1 (#3627): [Mdl 1A, 1C, 1D only] **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Control Storage Expansion (#1801) and Extended Function Store Type C1 (#3622) must be installed before this feature can be installed.

ENCRYPT/DECRYPT (#3680). [Mdl 1C (SDLC) only] Provides the Federal Data Encryption Standard algorithm to encrypt and decrypt data messages under a 56-bit key variable. When used in conjunction with the ACF/VTAM Encrypt/Decrypt feature (#6010,

Program 5735-RC2) and the IBM Programmed Cryptographic Facility Program Product (Program 5740-XY5), data transmitted over unprotected communications lines can be safeguarded through cryptography. **Maximum:** One. **Field Installation:** Yes.

Note: A mercury battery, IBM Part No. 1743456 or equivalent, is needed. A battery is shipped with this feature. See M10000 pages for additional or replacement battery. Replacement of the discharged battery is the customer's responsibility. The discharged IBM battery should be returned to IBM.

EXTERNAL MODEM INTERFACE (#3701). [Model 1C only] Provides the appropriate cable and interface logic necessary to attach either an external IBM or non-IBM modem with its own clocking for communication over analog facilities or to attach a data service unit for communication over non-switched digital facilities such as the AT&T Dataphone* digital data service network. See item [3] under "Specify" for cable length. **Limitation:** Cannot be installed with Digital Data Service (DDS) Adapter feature (#5650 or #5651). **Maximum:** One. **Prerequisite:** Either Common Communications Adapter (#6302) or High Performance Communication Adapter (#6303). **Field Installation:** Yes.

DIGITAL DATA SERVICE (DDS) ADAPTER (#5650 for Point-to-point Operation ... #5651 for Multipoint Operation.) [Mdl 1C only] An adapter for BSC or SDLC data transmission at speeds of 2400, 4800 or 9600 bps over the AT&T non-switched Dataphone* Digital data service. The DDS Adapter interfaces to a DDS channel service unit, the customer site termination of the DDS network. See "Note" below for communication cable length. **Specify:** #9822 for 2400 bps, #9823 for 4800 bps, or #9825 for 9600 bps. **Maximum:** One #5650 or #5651. **Limitation:** Cannot be installed with External Modem Interface (EMI) (#3701) feature. **Field Installation:** Yes. **Prerequisite:** Either Common Communications Adapter (#6302) or High Performance Communications Adapter (#6303).

Note: When ordering this feature for field installation, use one of the following Specify codes if it is desired to have the length of the communications cable other than the standard 6.1 meters (20 feet) provided. **Specify:** #9061 for 3.0 meters (10 feet), #9062 for 9.1 meters (30 feet), or #9063 for 12.2 meters (40 feet).

COMMON COMMUNICATIONS ADAPTER (#6302). [Model 1C only] Required for attachment to communication lines at speeds up to 9600 bps (SNA/SDLC or BSC transmission control protocols) through either an IBM or non-IBM Modem with its own clocking. **Maximum:** One. **Field Installation:** Yes. **Limitations:** [1] High Performance Communications Adapter (#6303) must be ordered/installed in lieu of this feature, if SNA/SDLC protocol is required with a line speed greater than 7200 bps and a Category B Terminal Adapter(s) (#7802 - 7805) is installed. [2] This feature cannot be installed with the High Performance Communications Adapter (#6303).

HIGH PERFORMANCE COMMUNICATIONS ADAPTER (#6303). [Model 1C only] When SNA/SDLC protocol is required with a line speed of 9600 bps and a Terminal Adapter Type B(s) is installed, this feature is required for attachment to the communications lines through either an IBM or non-IBM modem with its own clocking. **Maximum:** One. **Limitations:** [1] With this feature installed, operation is restricted to SNA/SDLC protocol. IML load for BSC protocol is no longer possible. [2] This feature cannot be installed with Common Communications Adapter (#6302). **Field Installation:** Yes.

TERMINAL ADAPTER TYPE A1 thru A3 (#6901, 6902, 6903). One each of these adapters can be installed. Each adapter provides for the attachment of an additional eight Category A terminals. The base control unit, which provides for attachment of eight Category A terminals, can be expanded with these three terminal adapters to a maximum configuration of thirty-two Category A terminals. These terminal adapters must be installed in sequence, making it important to order the correct adapter feature code(s).

- Terminal Adapter Type A1 (terminals 9-16) -- #6901
- Terminal Adapter Type A2 (terminals 17-24) -- #6902
- Terminal Adapter Type A3 (terminals 25-32) -- #6903

Limitation: Terminal Adapter Type A3 (#6903) cannot be installed with Terminal Adapter Types B3 (#7804) and B4 (#7805). **Maximum:** One of each type terminal adapter. **Prerequisite:** #6902 requires #6901 ... #6903 requires #6902. **Field Installation:** Yes.

TERMINAL ADAPTER TYPE B1 (#7802). Permits the attachment of four Category B terminals and provides for the installation of Terminal Adapters Types B2, B3 and B4 when additional Category B terminals are desired. **Maximum:** One. **Field Installation:** Yes. **Note:** When installed on a 3274 mdl 1A, or on a 3274 mdl 1C with SNA IML (#9433), Extended Function Store feature(s) (#3622, #3625, #3627) and Control Storage Expansion (#1801) are required. See 3274 Control Storage Requirement Tables under Extended Function Store

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features to accurately determine what storage features are required on 3274 mdl 1A, 1C and 1D in specific configurations.

TERMINAL ADAPTER TYPE B2 THRU B4 (#7803 thru #7805).

Each of these terminal adapters permits the attachment of four additional Category B terminals. A maximum of one each of these terminal adapters can be installed for a combined total of twelve additional or sixteen Category B terminals attached to a control unit. These terminal adapters must be installed in sequence, making it important to order the correct adapter feature code(s).

Field Installation: Yes.

- Terminal Adapter Type B2 (terminals 5-8) -- #7803
- Terminal Adapter Type B3 (terminals 9-12) -- #7804
- Terminal Adapter Type B4 (terminals 13-16) -- #7805

Limitation: Terminal Adapter Type B3 (#7804) and Terminal Adapter Type B4 (#7805) cannot be installed with Terminal Adapter Type A3 (#6903). **Maximum:** One of each type terminal adapter. **Prerequisite:** Terminal Adapter Type B1 (#7802) must be installed before these adapters can be installed. **Field Installation:** Yes.

WATERTIGHT POWER CONNECTOR (#8801). [Models 1A, 1B and 1D only] Provides a watertight connector on the power cable to satisfy local ordinances requiring this type termination in specific locations. See "Specify" for cable length to be ordered. **Maximum:** One. **Field Installation:** Not recommended. **Limitation:** The only valid voltage specify codes are #9884 and #9894. One of these two voltage codes must be specified when ordering this feature.

Special Feature Prices:	MRC	MLC		Purch	MMMC
		2 Yr			
Control Storage Expn	#1801	\$31	\$26	\$1,055	\$5.50
Extended Function Store					
Type C1	3622	58	49	1,170	10.00
Type C3	3625	58	49	1,170	10.00
Type D1	3627	58	49	1,170	10.00
Encrypt/Decrypt	3680	61	52	2,115	2.50
Extnl Modem Interface	3701	12	10	400	4.00
DDS Adapter, Pt-to-pt	5650	24	20	840	2.00
DDS Adapter, Multipt	5651	24	20	840	2.00
Common Cmncnts Adapt	6302	12	10	450	2.50
High Performance					
Communications Adapter	6303	35	30	1,200	10.50
Terminal Adapter					
Type A1	6901	32	27	1,215	2.50
Type A2	6902	32	27	1,215	2.50
Type A3	6903	32	27	1,215	2.50
Type B1	7802	38	32	1,300	5.00
Type B2	7803	32	27	1,100	3.00
Type B3	7804	32	27	1,100	3.00
Type B4	7805	32	27	1,100	3.00
Watertight Pwr Connector	8801	NC	NC	NC	NC

CONTROL STORAGE REQUIREMENT FUNCTIONS

APL/Text Control Function: This function, selectable during the customization of a 3274 mdl 1A, 1C or 1D, expands the character handling capability of the 3274 to accommodate the APL, Text, and graphic plot character sets for the APL/Text Feature (#1120) on 3278 Display Stations and 3287 Printers attached via Type A Terminal Adapters (#6901, 6902, 6903).

Note: The 3274 Control Unit, with or without this APL/Text control function, does NOT support the 3270 Data Analysis/APL Feature (#1066) on attached 3277 Display Stations or 3284, 3286 or 3287 Printers, NOR does it support the Text Print Feature (#7880) on attached 3288 Line Printers.

3289 Text Print Control Function: This function, selectable during the customization of a 3274 mdl 1A, 1C or 1D, extends the character handling capability of the 3274 to accommodate the Text characters for the Text Print Feature (#1130) on attached 3289 Line Printers.

Copy Function: This function, selectable during the customization of a 3274 mdl 1C (BSC) or 1D, enables the copying of the screen contents of an attached 3278 Display Station to an attached 3287 or 3289 printer through use of the Local Print Key on the display keyboard. This function is provided as basic on the 3274 mdl 1A, 1B and 1C (SNA). The ability to perform host initiated local copies from a 3278 to a 3287 or 3289 attached to a 3274 mdl 1A or 1C (SNA) is also provided as basic. In addition, the 3274 mdl 1C (BSC) supports the 3270 host Copy command as basic.

Local Copy Summary

3274 Model	Print Key	Host Initiated
1A	Basic	Basic
1B	Basic	Not Applicable
1C (BSC)	Cust.Option	Basic
1C (SNA)	Basic	Basic
1D	Cust. Option	Not Applicable

Host Loadable Authorization Matrix: This function, selectable during the 3274 customization process, provides the capability for the 3274, during subsequent IML procedures, to receive, from a user-written application program at the host CPU, an updated Printer Authorization Matrix to override the matrix created by the customization operator or by system default.

Between Bracket Sharing Function: This function, selectable during the customization of a 3274 mdl 1A or 1C (SNA), enables attached 3287 and 3289 printers to be used as Local Copy output devices for the screen contents of attached 3278 Display Stations, when the printers are Between Brackets with the host application program. Printers are available for Local Copy operations only when they are not in session with an application program if this option is not selected.



IBM 3275 DISPLAY STATION Model 2

Purpose: A single remote cathode ray tube display station. Provides controls and display of alphanumeric information from a S/360 mdl 25, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195 or any S/370 Processor via a 2701 Data Adapter Unit, 2703 Transmission Control or, except for S/360 mdls 25 or 85, a 3704 or 3705 Communications Controller on half-duplex or duplex communications facilities using binary synchronous transmission. It also provides controls and display of alphanumeric information from any 4300 Processor via a 2701 Data Adapter Unit, or 3704 and 3705 Communications Controller on a half-duplex or duplex communications facilities using binary synchronous transmission. Communication is also possible via a Communications Adapter feature on the 4331 Processor (Note: This is not supported by ACF/VTAME). **NOTE:** See 3704 and 3705 *Machines and Programming* sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

NOTE: For possible use with 1130, S/360 mdl 20 or System/3, see GSD Manual.

Model 2 Displays 1,920 characters ... 24 lines of 80 characters each.

Highlights: Displays sixty-three 7 x 9 dot matrix characters ... 36 alphanumeric, 27 special characters, including the space. Features Data-Field Organization, which permits individual fields of data on the screen to be program-defined with various attributes such as protected or unprotected, alphanumeric or numeric, normal intensity, non-displayed, or brightened intensity, and selector light-pen detection-allowed or disallowed.

Display Exception Monitoring Facility (DEMF) a software tool for network problem determination/isolation enhances the availability and serviceability of the 3275 in BSC mode. See DEMF in the Programming/SCP sections for OS/VS1 and OS/VS2.

Editing Features -- typematic, cursor, tab, protected-data, insert and delete, and extended-erase (erase to end-of-field, erase all keyboard input data, erase entire screen) are standard features for displays equipped with a keyboard.

Input Flexibility -- a choice of keyboards, a selector light-pen, and a set of program function keys provide unmatched input flexibility ... see "Special Features" below.

Security Enhancement Features -- a special Non-displayed Keying Mode (standard) provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock (optional) prevents modification of data on the display unless the key is turned to the "On" position. An Operator Identification Card Reader (optional) is provided to enter system user identification. This enhances the (programmed) control of his access to data and audit of his actions. It may also be used to enter any sequence of characters (pre-recorded on a card) for other purposes such as transaction control, account control, and billing.

Optional features allow the attachment of a 3284 mdl 3 dedicated printer, EBCDIC or ASCII keyboard, selector light-pen, audible alarm and other features ... see "Special Features" below.

Communications: The 3275 may be multidropped on the same facility with other BSC devices (1800, 2715, 2770, 2780, 3271, 3275 and 3780) as tributary stations on a multipoint line with a S/360 mdl 25-195 (except mdl 44), or any S/370 or 4300 Processor as the control station.

Communications with a S/370 mdl 115, 125, 135, 135-3 or 138 can be made via the Integrated Communications Adapter (#4640) and appropriate binary synchronous features on the 3115, 3125, 3135, 3135-3 or 3138 (or via the Communications Adapter feature on the 4331. Note: These units are not supported by ACF/VTAME.) as well as via the 2701, 2703, 3704 or 3705.

Communications Facilities: The 3275 operates in half-duplex multipoint mode on half-duplex facilities at transmission speeds of 1200, 2000 or 2400 bps on facilities D3, D4 or X1M via the 2701, 2703, 3704, 3705 or #4640 on the 3115, 3125, 3135, 3135-3, 3138 using binary synchronous transmission.

The 3275 operates in half-duplex multipoint mode on duplex facilities at transmission speeds of 1200, 2000, 2400 or 4800 bps on facilities D3, D4, D5, X1M or X2M via the 2701, 2703, 3704, 3705, or #4640 on the 3115, 3125, 3135, 3135-3 or 3138, using binary synchronous transmission. Half-duplex multipoint operation at a speed of 7200 bps is available on facility D9 via the 2701, 3704, 3705, or #4640 on the 3115, 3125, 3135, 3135-3, 3138 using binary synchronous transmission. The 3275 operates on switched network facilities at a transmission speed of 600/1200 bps when equipped with feature #3440 using binary synchronous transmission. See M 2700 pages for facilities.

Modems: One IBM modem may be attached to a 3275.

PREREQUISITE: #7821 is required on the 3275 for speeds over 2400 bps on leased lines.

Modem	Speed (bps)
3863 mdl 1	2400/1200
3864 mdl 1	4800/2400
3872 mdl 1	2400
3874 mdl 1	4800
3875 mdl 1	7200

NOTES: 4 wire switched network backup is available on the 3863 and 3864 modems. Switched network backup operation is available on the 3872 mdl 1, 3874 and 3875. For communications capabilities, product utilization and special features, see M 2700, 2701, 3705, 3863, 3864, 3872, 3874 and 3875 pages.

PREREQUISITES: Transmission via common carrier facility to a 2701, 2703, 3704, 3705 or #4640 on 3115, 3125, 3135, 3135-3, 3138, or a Communications Adapter (#1601) feature on the 4331, requires a modem. See M 2700 pages.

A keyboard must be installed on each 3275 as a diagnostic aid.

System 360/370 or 4300 Processor availability will be restricted unless the using system provides sufficient core to allow diagnostic programs (OLTs) to be executed. For details associated with the required additional core sizes, see the appropriate SRL (TCAM, BTAM and VTAM).

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Cables: Cable to attach modem should be ordered. Refer to 3270 *Installation Manual - Physical Planning*, GA27-2787.

[3] System Attachment: identify the host processor(s) by specifying the following codes;

NOTE: See GSD manual for codes for use with System/3.

Processor	Code	Processor	Code
S/360 mdl 25	#9571	S/370 mdl 135, 135-3	#9581
S/360 mdl 30	9572	S/370 mdl 138	9595
S/360 mdl 40	9573	S/370 mdl 145, 145-3	9582
S/360 mdl 50	9575	S/370 mdl 148	9596
S/360 mdl 65	9576	S/370 mdl 155	9583
S/360 mdl 67	9577	S/370 mdl 158	9587
S/360 mdl 75	9578	S/370 mdl 165	9584
S/360 mdl 85	9579	S/370 mdl 168	9588
S/360 mdl 195	9580	3031 Processor	9599
S/370 mdl 115	9589	3032 Processor	9598
S/370 mdl 125	9586	3033 Processor	9597
		4331 Processor	9606
		4341 Processor	9607

[4] Transmission Code: Specify one; #9761 -- for EBCDIC Transmission Code (available at time of manufacture only) ... utilizes 8-bit EBCDIC code over the transmission facilities ... used in conjunction with EBCDIC Character Set (#9089). #9762 -- for ASCII Transmission Code (available at time of manufacture only) ... utilizes 8-bit ASCII code over the transmission facilities ... used in conjunction with ASCII Character Set (A) (#9091) or (B) (#9092).

[5] Character Set: Specify one of the following:
#9089 -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC typewriter keyboard. **PREREQUISITE:** EBCDIC Transmission Code (#9761).

#9091 -- for ASCII Character Set (A) (available at time of manufacture only) ... provides the 64 ASCII characters but substitutes the Logical OR (!) and Logical NOT (-) for the exclamation mark (!) and circumflex (^) **PREREQUISITE:** ASCII Transmission Code (#9762).

#9092 -- for ASCII Character Set (B) (available at time of manufacture only) ... provides the standard 64 ASCII character set. **PREREQUISITE:** ASCII Transmission Code (#9762).

PRICES:	Mdl	MAC/ MRC	MLC 2 yr	Purchase	MMMC
	3275	2	\$ 136	\$116	\$4,735 \$21.00

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 60% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Field Installable.



3275 Display Station Model 2 (cont'd)

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges.)

From	To	12
2		\$2,505

SPECIAL FEATURES

AUDIBLE ALARM (#1090). An alarm, sounded under program control, to alert the operator to a special condition. This alarm, during keyboard operation, is sounded when a character is entered into the next to last position on the screen. **Maximum:** One. **Field Installation:** Yes.

DIAL (#3440). [Available at time of manufacture only] Provides the capability of operating over switched communications facilities at speeds of 600/1200 bps. **Limitation:** Mutually exclusive with Transmission Speed #7820 and #7821.

OPERATOR IDENTIFICATION CARD READER (#4600). Provides the capability of reading a 2-1/8 inches x 3-3/8 inches (53.9mm x 85.7mm) plastic data processing card with an encoded magnetic stripe. Using the 10-numeric character set, the number of characters that can be read is 1-37 characters at 75 BPI (bits per inch).

Maximum: One. **Field Installation:** Yes. **Prerequisite:** Any Keyboard.

KEYBOARD (#4630 - 4636).

#4630 -- 66 key EBCDIC Typewriter Keyboard, typewriter-like layout, movable, with 45 alphameric keys and 21 control keys. **Prerequisite:** EBCDIC Character Set (#9089).

#4631 -- 66 key EBCDIC Data Entry Keyboard, movable, with 36 alphameric keys and 30 control keys. **Prerequisite:** EBCDIC Character Set (#9089).

#4632 -- 78 key Operator Console Keyboard, operator-console layout, movable, with 45 alphameric keys, 21 control keys, and 12 program function keys. **Prerequisite:** EBCDIC Character Set (#9089).

#4633 -- 78 EBCDIC Typewriter Keyboard, 66 key EBCDIC layout with 12 additional program function keys, movable. **Prerequisite:** EBCDIC Character Set (#9089).

#4634 -- 66 key ASCII Keyboard, ASCII typewriter layout, movable, with 45 alphameric keys and 21 control keys. **Prerequisite:** ASCII Character Set (A) or (B) (#9091 or #9092).

#4635 -- 78 key ASCII Keyboard, 66 key ASCII typewriter layout, with 12 additional function keys, movable. **Prerequisite:** ASCII Character Set (A) or (B) (#9091 or #9092).

#4636 -- 66 key EBCDIC Data Entry Keyboard, keypunch layout, movable, with 36 alphameric keys and 30 control keys. This is the recommended keyboard for data entry, including Video 370. **Prerequisite:** EBCDIC Character Set (#9089).

Maximum: One of the above. **Field Installation:** Yes.

KEYBOARD NUMERIC LOCK (#4690). Provides the ability to lock the keyboard, if a non-numeric key [other than 0-9, minus (-), period (.) or dup] is depressed in a predefined numeric-only field. **Maximum:** One. **Field Installation:** Yes

1200 BPS INTEGRATED MODEM (#5500). Provides a modem capable of operation at a speed of 1200 bps on non-switched communications facilities or at speeds of 600/1200 bps on the switched communications facilities via a similarly equipped 2701, 3705 or Communications Adapter on 4331 Processor. **Field Installation:** Yes. **Prerequisites:** Dial (#3440) on the switched communications facilities ... Transmission Speed (#7820) on non-switched communications facilities.

1200 BPS INTERGRATED MODEM WITH AUTO ANSWER (#5501). Provides a modem with automatic answering for use with the switched telephone network at speeds of 600/1200 bps via a similarly equipped 2701, 3705 or Communications Adapter on 4331 Processor. **Field Installation:** Yes. **Prerequisite:** Dial (#3440).

PRINTER ADAPTER (#5550). To attach a 3284 Printer mdl 3. Provides the controls to print out the contents of the 3275 buffer. Used with the basic 3275. **Maximum:** One. **Field Installation:** Yes.

SECURITY KEYLOCK (#6340). A lock and key which prevents modification and display of data on the display when in the "off" position. **Maximum:** One. **Field Installation:** Yes.

SELECTOR LIGHT-PEN (#6350). A hand-held, pen-like device that permits the operator to select fields of data from a display for computer input. **Maximum:** One. **Field Installation:** Yes.

TRANSMISSION SPEED (#7820, 7821). #7820 -- for transmitting over communications facilities at 1200 bps. Clocking is provided by the 3275. #7821 -- for transmitting at speeds of 4800 or

7200 bps. Clocking provided by modem. **Field Installation:** Yes. **Maximum:** One **Limitations:** Mutually exclusive with Dial (#3440).

Special Feature Prices:	MAC/MRC	MLC 2 yr	Purch	MMMC	
Audible Alarm	#1090	\$ 4	\$ 3	\$ 145	\$.50
Dial	3440	8	7	328	1.00
Operator Ident Card Reader	4600	13	11	437	3.50
Keyboard,					
66 Key EBCDIC Typewriter	4630	13	11	520	5.50
66 Key EBCDIC Data Entry	4631	13	11	520	6.50
78 Key Operator Console	4632	32	27	1,010	15.00
78 Key EBCDIC Typewriter	4633	28	24	869	9.00
66 Key ASCII Typewriter	4634	13	11	520	5.50
78 Key ASCII Typewriter	4635	28	24	869	9.00
66 Key EBCDIC Data Entry (keypunch layout)	4636	15	13	522	6.50
Keyboard Numeric Lock	4690	NC	NC	NC	NC
1200 bps Integrated Modem	5500	16	14	535	3.00
1200 bps Integrated Modem w Auto Answer	5501	21	18	714	3.50
Printer Adapter	5550	NC	NC	NC	NC
Security Keylock	6340	35SUC	-	35	NC
Selector Light-Pen	6350	24	20	728	1.50
Transmission Speed					
- 1200 bps	7820	NC	NC	NC	NC
- 4800 bps	7821	4	3	145	.50

IBM 3275 DISPLAY STATION Model 3

Purpose: A single remote cathode ray tube display station for use in the 3650 Programmable or Retail Store System. Provides controls and display of alphameric information from a 3651 Store Controller utilizing a 2400 bps Loop communications facility. See the 3650 Programmable or Retail Store System description for communications facility details.

Highlights: Displays 1,920 characters ... 24 lines of 80 characters each. Displays sixty-three 7 x 9 dot matrix characters ... 36 alphameric, 27 special characters, including the space. Features Data Field Organization, which permits individual fields of data on the screen to be program-defined with various attributes such as protected or unprotected, alphameric or numeric, and normal intensity, non-displayed, or brightened intensity.

Editing Features -- Typamatic cursor, tab, back-tab, protected-data, insert and delete, and extended-erase (erase to end-of-field, erase all keyboard input data, erase entire screen) are standard features.

Input Flexibility -- The keyboard provides a set of three program action keys and five program function keys for input flexibility.

Security Enhancement Features -- A special non-displayed keying mode (standard) provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock (optional) prevents modification of data on the display screen unless the key is turned to the "On" position.

Optional features allow the attachment of a 3284 mdl 3 dedicated printer, an audible alarm, and the Security Keylock ... see "Special Features" below.

Communications: The 3275 mdl 3 may be attached to the Loop of the 3650 Programmable or Retail Store System along with the other types of terminals supported in that system.

Communicates only with a 3651 Store Controller mdl 25, 50 or 75. The 3275 mdl 3 includes the Loop Adapter and a 15 foot cable for attachment to the Loop as described in the 3650 Programmable or Retail Store System description.

Maximum: The maximum number of 3275 mdl 3s that can be attached to a 3651 mdl 25, 50 or 75 depends upon the number of positions available and the traffic volumes and response times required.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Keyboard: A 66 key EBCDIC Data Entry Keyboard (#4631) must be installed on each 3275 mdl 3.

[3] Transmission Code: Specify #9761 -- EBCDIC Transmission Code.

[4] Character Set: Specify #9089 -- EBCDIC Character Set.



IBM 3275 Display Station Model 3 (cont'd)

PRICES:	Mdl	MAC/ MRC	MLC 2 yr	Purchase	MMMC
	3275	3	\$ 184	\$ 157	\$4,935 \$25.00

Plan Offering: Plan B Warranty: B Machine Group: A
 Purchase Option: 60% Per Call: 1
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 5%

Model Changes: 3275 model 3 cannot be changed in the field from or to model 1 or 2.

SPECIAL FEATURES

AUDIBLE ALARM (#1090). An alarm, activated under program control, to alert the operator to a special condition. This alarm, during keyboard operation, is sounded when a character is entered into the next to last position on the screen. **Maximum:** One. **Field Installation:** Yes.

KEYBOARD (#4631). 66 Key EBCDIC Data Entry Keyboard, key-punch like layout, movable, with 36 alphameric keys and 30 control keys. **Maximum:** One. **Field Installation:** Yes.

KEYBOARD NUMERIC LOCK (#4690). Provides the ability to lock the keyboard if a non-numeric key [other than 0-9, minus (-), period (.), or dup] is depressed in a predefined numeric-only field. **Maximum:** One. **Field Installation:** Yes.

PRINTER ADAPTER (#5550). To attach a 3284 Printer mdl 3. Provides the controls to print out the contents of the 3275 mdl 3 buffer. **Maximum:** One. **Field Installation:** Yes.

SECURITY KEYLOCK (#6340). A lock and key which prevents modification and display of data on the display when in the "off" position. For additional or replacement keys, see M 10000 pages. **Maximum:** One. **Field Installation:** Yes.

TRANSMISSION SPEED, 9600 BPS (#7825). Provides for transmission at 9600 bps over a local Loop on a 3651 mdl A50, B50. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** 9600 bps Loop Adapter (#4890) on the 3651 mdl A50 or B50.

Special Feature Prices:		MAC/ MRC	MLC 2 yr	Purch	MMMC
Audible Alarm	#1090	\$ 4	\$ 3	\$ 145	\$.50
Keyboard	4631	13	11	520	6.50
Keyboard Numeric Lock	4690	NC	NC	NC	NC
Printer Adapter	5550	NC	NC	NC	NC
Security Keylock	6340	35SUC	-	35	NC
Transmission Spd, 9600 bps	7825	9	8	297	2.50

IBM 3275 DISPLAY STATION Model 12 [Remote Attachment]

Purpose: A single remote cathode ray tube display station. Provides controls and display of alphameric information from any S/370 or 4300 Processor via a 3704 or 3705 Communications Controller on half-duplex or duplex communications facilities using Synchronous Data Link Control (SDLC) transmission. Communication is also possible via a Communications Adapter feature on the 4331 Processor (Note: This is not supported by ACF/VTAME). **NOTE:** See the 3704/3705 and 4331 Processor *Machines and Programming* sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

Model 12 Displays 1,920 characters ... 24 lines of 80 characters each. The basic unit will transmit EBCDIC transmission code at line speeds of 2000 to 9600 bps.

Highlights: Displays sixty-three 7 x 9 dot matrix characters ... 36 alphameric, 27 special characters, including the space. Features Data-Field Organization, which permits individual fields of data on the screen to be program-defined with various attributes such as protected or unprotected, alphameric or numeric, normal intensity, non-displayed, or brightened intensity, and selector light-pen detection-allowed or disallowed.

Editing Features -- typematic cursor, tab, back-tab, protected-data, insert and delete, and extended-erase (erase to end-of-field, erase all keyboard input data, erase entire screen) are standard features for displays equipped with a keyboard.

Input Flexibility -- a choice of keyboards, a selector light-pen, and a set of program function keys provide unmatched input flexibility ... see "Special Features" below.

Security Enhancement Features -- a special Non-displayed Keying Mode (standard) provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock (optional) prevents modification of data on the display unless the

key is turned to the "On" position. An Operator Identification Card Reader (optional) is provided to enter system user identification. This enhances the (programmed) control of his access to data and audit of his actions. It may also be used to enter any sequence of characters (pre-recorded on a card) for other purposes such as transaction control, account control, and billing.

Optional features allow the attachment of a 3284 mdl 3 dedicated printer, EBCDIC or ASCII keyboard, selector light-pen, audible alarm and other features ... see "Special Features" below.

Communications: The 3275 mdl 12 may be multidropped on the same facility with other SDLC devices on a multipoint or a duplex-multipoint line with any S/370 or 4300 Processor as the control station.

Communications Facilities: The 3275 mdl 12 operates in half-duplex multipoint mode on half-duplex facilities at transmission speeds of 1200, 2000 or 2400 bps via the 3704, 3705 or Communications Adapter on the 4331 Processor using SDLC transmission. The 3275 mdl 12y operate in half-duplex multipoint mode or in duplex multipoint mode on duplex facilities at transmission speeds of 1200, 2000, 2400, 4800, 7200 or 9600 bps via the 3704, 3705 or Communications Adapter on the 4331 Processor using SDLC transmission. See M 2700 and M 3704/3705 and M 4331 sales manual pages.

Modems: One IBM modem may be attached to a 3275 mdl 12.

Modem	Speed (bps)
3863 mdl 1	2400/1200
3864 mdl 1	4800/2400
3865 mdl 1, 2	9600/4800
3872 mdl 1	2400
3874 mdl 1	4800
3875 mdl 1	7200

NOTES: 4 wire switched network backup is available on 3863, 3864 and 3865 modems. Manual switched network backup is available on the 3872, 3874 and 3875. For communications capabilities, product utilization and special features, see M 2700, 3863, 3864, 3865, 3872, 3874 and 3875 pages.

PREREQUISITES: (1) Transmission via communications facilities to a 3704, 3705 or Communications Adapter on the 4331 Processor requires a modem. Clocking for 1200 bps is provided by the 3275. Clocking above 1200 bps is provided by the modem ... (2) A keyboard must be installed on each 3275 mdl 12 as a diagnostic aid.

Bibliography: See KWIC Index, G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Cables: Cable to attach modem should be ordered. Refer to 3270 *Installation Manual - Physical Planning*, GA27-2787, for cable information.

[3] System Attachment: identify the host processor(s) by specifying the following codes;

Processor	Code	Processor	Code
S/370 mdl 115	#9589	S/370 mdl 158, 158MP	#9587
S/370 mdl 125	9586	S/370 mdl 165 II	9584
S/370 mdl 135, 135-3	9581	S/370 mdl 168, 168MP	9588
S/370 mdl 138	9595	3031 Processor	9599
S/370 mdl 145, 145-3	9582	3032 Processor	9598
S/370 mdl 148	9596	3033 Processor	9597
S/370 mdl 155 II	9583	4331 Processor	9606
		4341 Processor	9607

[4] Character Set: Specify one of the following;
 #9089 -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 ASCII characters described on the EBCDIC typewriter keyboard.

#9091 -- for ASCII Character Set (A) (available at time of manufacture only) ... provides the 64 ASCII characters but substitutes the Logical OR (|) and Logical NOT (~) for the exclamation mark (!) and circumflex (^). **PREREQUISITE:** ASCII Transmission Code (#1200).

#9092 -- for ASCII Character Set (B) (available at time of manufacture only) ... provides the standard 64 ASCII character set. **PREREQUISITE:** ASCII Transmission Code (#1200).

PRICES:	Mdl	MAC/ MRC	MLC 2 yr	Purchase	MMMC
	3275	12	\$186	\$158	\$6,440 \$53.00

Plan Offering: Plan B Warranty: B Machine Group: A
 Purchase Option: 60% Useful Life Category: 2 Per Call: 1
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 5%

**3275 Display Station Model 12 (cont'd)****SPECIAL FEATURES**

AUDIBLE ALARM (#1090). An alarm, sounded under program control, to alert the operator to a special condition. This alarm, during keyboard operation, is sounded when a character is entered into the next to last position on the screen. **Maximum:** One. **Field Installation:** Yes.

ASCII TRANSMISSION CODE (#1200). Utilizes 8-bit ASCII Code over transmission facilities. Used in conjunction with ASCII Character Set (A) (#9091) or ASCII Character Set (B) (#9092). **Field Installation:** Available at time of manufacture only.

OPERATOR IDENTIFICATION CARD READER (#4600). Provides the capability of reading a 2-1/8" x 3-3/8" (53.9mm x 85.7mm) plastic data processing card with an encoded magnetic stripe. Using the 10-numeric character set, the number of characters that can be read is 1-37 characters at 75 BPI (bits per inch).

Maximum: One. **Field Installation:** Yes. **Prerequisite:** Any keyboard.

KEYBOARDS (#4630 thru 4636).

- #4630 -- 66 key EBCDIC Typewriter Keyboard, typewriter-like layout, movable, with 45 alphameric keys and 21 control keys.
- #4631 -- 66 key EBCDIC Data Entry Keyboard, movable, with 36 alphameric keys and 30 control keys.
- #4632 -- 78 key EBCDIC Operator Console Keyboard, operator-console layout, movable, with 45 alphameric keys, 21 control keys and 12 program function keys.
- #4633 -- 78 key EBCDIC Typewriter Keyboard, movable, with 66 key EBCDIC layout and 12 additional program function keys.
- #4634 -- 66 key ASCII Keyboard, ASCII typewriter layout, movable, with 45 alphameric keys and 21 control keys.
Prerequisite: ASCII Character Set (A) (#9091) or (B) (#9092).
- #4635 -- 78 key ASCII Keyboard, 66 key ASCII typewriter layout, with 12 additional function keys, movable. **Prerequisite:** ASCII Character Set (A) (#9091) or (B) (#9092).
- #4636 -- 66 key EBCDIC Data Entry Keyboard, keypunch layout, movable, with 36 alphameric keys and 30 control keys.

Maximum: One of the above. **Field Installation:** Yes.

KEYBOARD NUMERIC LOCK (#4690). Provides the ability to lock the keyboard if a non-numeric key [other than 0-9, minus (-), period (.) or dup] is depressed in a predefined numeric-only field. **Maximum:** One. **Field Installation:** Yes.

1200 BPS INTEGRATED MODEM (#5500). Provides a modem capable of operating at a speed of 1200 bps on non-switched communications facilities via a similarly equipped 3704, 3705 or Communications Adapter on the 4331 Processor. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Transmission Speed (#7820).

PRINTER ADAPTER (#5550). To attach a 3284 Printer mdl 3. Provides the controls to print out the contents of the 3275 mdl 12 buffer. Used with the basic 3275 mdl 12. **Maximum:** One. **Field Installation:** Yes.

SECURITY KEYLOCK (#6340). A lock and key which prevents modification and display of data on the display when in the "off" position. **Maximum:** One. **Field Installation:** Yes.

SELECTOR LIGHT-PEN (#6350). A hand-held, pen-like device that permits the operator to select fields of data from a display for computer input. **Maximum:** One. **Field Installation:** Yes.

TRANSMISSION SPEED (#7820). For transmitting over communications facilities at 1200 bps. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	MLC		Purch	MMMC
		2 yr			
Audible Alarm	#1090	\$ 4	\$ 3	\$ 145	\$.50
ASCII Transmission Code	1200	8	7	286	.50
Operator Ident Card Reader	4600	13	11	437	3.50
Keyboard -					
66 Key EBCDIC Typewriter	4630	13	11	520	5.50
66 Key EBCDIC Data Entry	4631	13	11	520	6.50
78 Key Operator Console	4632	32	27	1,010	15.00
78 Key EBCDIC Typewriter	4633	28	24	869	9.00
66 Key ASCII Typewriter	4634	13	11	520	5.50
78 Key ASCII Typewriter	4635	28	24	869	9.00
66 Key EBCDIC Data Entry (Keypunch layout)	4636	15	13	522	6.50
Keyboard Numeric Lock	4690	NC	NC	NC	NC
1200 bps Integrated Modem	5500	16	14	535	3.00
Printer Adapter	5550	NC	NC	NC	NC
Security Keylock	6340	35SUC	-	35	NC
Selector Light-Pen	6350	24	20	728	1.50
Trans Speed - 1200 bps	7820	NC	NC	NC	NC

IBM 3276 CONTROL UNIT DISPLAY STATION

Purpose: An enhanced, cathode-ray tube (CRT), display station used for displaying alphanumeric data, and for entering data into and receiving data from a S/360, a S/370, a 4300 Processor, a 3790 Communication System or an 8100 System. The 3276 optionally provides control and multiplexing capabilities to support up to seven 3278 Display Stations or 3287 Printers or 3289 Line Printers, allowing a maximum cluster size of eight displays or printers including the 3276's own display. A keyboard, or a selector light-pen permit an operator to display and manipulate data on the screen in a flexible and efficient manner. The 3276 meets both general and unique display requirements with its set of basic and optional features.

The 3276 communicates: with a S/370 or 4300 Processor using Synchronous Data Link Control (SDLC) or Binary Synchronous Communication (BSC) over communications facilities; or with a S/360, S/370 or 4300 Processor using BSC over communications facilities; or communicates with a 3790 Communication System using SDLC over communications facilities; or with an 8100 System using SDLC via a communication link, or a direct or data link attached loop.

For possible use with System/3, see GSD manual.

Models 1 through 4 -- for use with BSC transmission control.

- Model 1** Displays up to 960 characters ... 12 lines of 80 characters each. Can attach up to seven 3278 mdl 1s, 3287s (mdls 1 and 2) or 3289s (mdls 1 and 2) in any combination.
- Model 2** Displays up to 1920 characters ... 24 lines of 80 characters each. Can attach up to seven 3278 mdls 1 and 2, 3287s (mdls 1 and 2) or 3289s (mdls 1 and 2) in any combination.
- Model 3** Displays up to 2560 characters ... 32 lines of 80 characters each. Can attach up to seven 3278 mdls 1, 2 and 3, 3287s (mdls 1 and 2) or 3289s (mdls 1 and 2) in any combination.
- Model 4** Displays up to 3440 characters ... 43 lines of 80 characters each. Can attach up to seven 3278s (mdls 1, 2, 3 and 4), 3287s (mdls 1 and 2) or 3289s (mdls 1 and 2) in any combination.

Models 11 through 14 -- for use with SNA/SDLC transmission control.

- Model 11** Displays up to 960 characters ... 12 lines of 80 characters each. Can attach up to seven 3278s (mdls 1, 2, 3 and 4), 3287s (mdls 1 and 2) or 3289s (mdls 1 and 2) in any combination.
- Model 12** Displays up to 1920 characters ... 24 lines of 80 characters each. Can attach up to seven 3278s (mdls 1, 2, 3 and 4), 3287s (mdls 1 and 2) or 3289s (mdls 1 and 2) in any combination.
- Model 13** Displays up to 2560 characters ... 32 lines of 80 characters each. Can attach up to seven 3278s (mdls 1, 2, 3 and 4), 3287s (mdls 1 and 2) or 3289s (mdls 1 and 2) in any combination.
- Model 14** Displays up to 3440 characters ... 43 lines of 80 characters each. Can attach up to seven 3278s (mdls 1, 2, 3 and 4), 3287s (mdls 1 and 2) or 3289s (mdls 1 and 2) in any combination.

NOTE: Models 1 and 11 have a 480 character mode for existing 480 character programs, and models 3, 4, 13 and 14 have a 1920 character mode to accommodate existing 1920 character programs.

For use with the 3790 Communication System: The 3791 Controller supports selected models of the 3276 in 1920 character mode. See the 3791 Configurator, GA27-2768-6, and 3791 Machines pages for additional information.

For use with an 8100 Information System: See the 8100 System configurator, GA27-2876 8100, and refer to the 8130/8140/8101 Machines and Programming pages for possible support restrictions.

Highlights: Displays a character within a 7 x 14 character matrix in 960, 1920 and 2560 character models; within a 7 x 11 character matrix in the 3440 character model. The basic 26 character upper case letters are presented in a 7x9 character matrix for the 960, 1920 and 2560 character models, and in a 7x8 character matrix for the 3440 character model. Displays 62 alphanumeric and 32 special characters, not including the Space and Null characters. The display character set may be restricted to upper case characters by the monospace switch. Uses 3270 Field Formatting capability which permits individual fields of data on the screen to be program defined with various attributes such as protected/unprotected, alphanumeric, normal/highlighted intensity,

displayable/non-displayable, and selector light-pen detection allowed/disallowed. The operator may initiate a local display-to-printer copy function (i.e., without host intervention) from the keyboard of a 3276 or 3278 attached to a 3276. The printer designation is controlled by a configuration default matrix which is fixed by the relative port positions of displays and printers attached to the 3276. Other printers may be accessed using the IDENT key. All terminals attached to a 3276 can be driven at distances of up to 1500 meters (4920 feet).

Devices attached to the 3276 are assigned port positions 1 through 8. Displays are authorized to print only to printers which are attached to higher numbered ports. If the IDENT key is not used, a PRINT operation from a given display will cause printing to take place at the first printer whose port position is higher than the display. The operator may use the IDENT key to print to any printer. (The host can perform copy in a manner compatible with existing 3271/3272 support).

Operator Factors -- the 3276 has an anti-glare screen. Indicators are displayed on the bottom row of the screen, outside the data display area, and provide useful operator information. Host display of data on the screen is accomplished without refresh interrupt (i.e., no blinking). The keyboard which is low in profile provides a palm rest area and has separators to help prevent accidental striking of control keys. The operator may select one of several cursor modes.

Cluster Capability -- up to seven 3278s, 3287s or 3289s may be attached. The basic 3276 provides a display and a port for one device, a 3278, 3287 or 3289. Up to three Terminal Adapters, each controlling up to two devices, can be attached to the 3276. The 3276 allows the attachment of seven additional displays and/or printers for a maximum cluster size of eight including its own display ... see "Special Features" below.

Editing Functions -- cursor move, tab, home key, back tab, insert, delete, extended erase (erase to end-of-field, erase all keyboard input data, and erase entire screen), and cursor select keys are all basic. All alphanumeric, special symbol, and cursor move keys have typematic capability. Double speed cursor typematic is attained with a simultaneous depressing of the ALT key and a horizontal cursor positioning key. The cursor select function provides an alternative to the Selector Light-pen function. Fields of data may be selected by positioning the cursor and then using the Cursor Select Key.

Input Flexibility -- a choice of keyboards or the selector light-pen provide input flexibility ... see "Special Features" below. Fields of data can be selected by positioning the cursor and operating the cursor select key, instead of using the Selector Light-Pen. Twelve program function (P.F.) keys are basic with all typewriter keyboards.

Security Functions -- a special non-displayed input mode provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock prevents modification or display of data in the display buffer unless the key is turned to the "on" position. An Address Keylock (optional) controls access to the address switches. These capabilities and the terminal's ability to identify itself to the host program (SNA/SDLC operation only), allow customer-supplied security program routines to control access to data and audit of actions. A Magnetic Slot Reader is available to enter system user identification. An Encrypt/Decrypt feature (optional) protects data transmitted over unsecured communications lines from accidental or intentional disclosure and/or modification (models 11, 12, 13 and 14 in S/370 or 4300 Processor attachment only).

Communications: The 3276 mdls 11 - 14, and the 3276 mdls 1 - 4 with the SDLC/BSC Switch (#6315) communicate with a S/370 or 4300 Processor using Synchronous Data Link Control (SDLC) transmission over communications facilities to a 3704/3705 Communications Controller, or a Communications Adapter feature (#1601) on the 4331. The 3276 mdls 1 - 4 communicate with a S/360, S/370 or 4300 Processor using Binary Synchronous transmission over communications facilities to, where applicable, a 2701 Data Adapter Unit, a 2703 Transmission Control, a 3704/3705 Communications Controller, or an Integrated Communications Adapter (S/370 mdls 115, 125, 135 or 138), or a Communications Adapter feature (#1601) on the 4331. Selected models of the 3276 communicate with the 3790 Communication System using Synchronous Data Link Control (SDLC) transmission over communications facilities. See 3790 Systems pages for specific models. All models of the 3276 can also communicate with a 3704/3705 Communications Controller or a Communications Adapter feature (#1601) on the 4331 at 1200 bps without need for communication facilities or a modem. The 3276 mdls 11, 12, 13 and 14 communicate with an 8100 System using Synchronous Data Link Control (SDLC) transmission via a data link, or a direct or data link attached loop. The 3276 mdl 1, 2, 3 and 4 with the SDLC/BSC Switch (#6315) can communicate with the 8100 System using SDLC transmission via a data link.

Communications Facilities: The 3276 operates in data half-



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duplex point-to-point or multipoint mode on half-duplex or duplex facilities at transmission speeds of 1200/600, 2000, 2400/1200, 4800/2400, 7200/3600 and 9600 (SNA/SDLC only) bps on non-switched facilities D3, D3M, D3SB, D4, D4M, D4SB, D5, D5M, D5SB, D6, D6M, D6SB, D7, D7M, D7SB, X1, X1M, X2, X2M, X3 and X3M. In addition, the 3276 mdls 11 - 14 also operate in half-duplex point-to-point mode at transmission speeds of 1200/600, 2400/1200 and 4800/2400 bps on switched facilities C4, C4M, C5, C5M, C6 and C6M. See M 2700 pages. The 3276 mdls 11, 12, 13 and 14 also operate in half duplex mode at 9600 bps over a direct attached loop, and at 2400 bps over a data link attached loop. For details, see M10000 pages.

Modems: If a Digital Data Service (DDS) Adapter (#5650 or #5651) is not installed, a 1200 bps Integrated Modem feature or an external IBM modem may be attached to a 3276. External modems require the External Modem Interface (#3701).

Modem	Speed (bps)
3863 mdl 1, 2	2400/1200
3864 mdl 1, 2	4800/2400
3865 mdl 1, 2	9600/4800
3872 mdl 1	2400/1200
3874 mdl 1	4800/2400
3875 mdl 1	7200/3600

4 wire switched network backup is available on 3863, 3864 and 3865 modems. Switched network backup operation with Manual Call and Manual or Auto Answer, is available on the 3872 mdl 1, 3874 mdl 1 and 3875 mdl 1. For communications capabilities, product utilization and special features, see M 2700, 3863, 3864, 3865, 3872, 3874 and 3875 pages.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the operator. See Customer Responsibilities below.

Display Exception Monitoring Facility (DEMF), a software tool for network problem determination/isolation enhances the availability and serviceability of the 3276 in BSC mode. See DEMF in the Programming/SCP sections for OS/VJS1 and OS/VJS2.

Customer Set-Up (CSU): The 3276 is designated Customer Set-Up thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at customer's receiving dock, unpacking and placement of 3276.
- Physical set-up, connection of cables to TP lines/modems and IBM devices incorporating protected customer access areas, switch settings, and check out.
- Contact Field Engineering to make cable connections of IBM CSU units to non-CSU units where customer access areas are not provided.
- Notify IBM of intent to relocate and follow IBM instructions for relocation.
- Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.
- Disconnecting, packing and removal to the customer's shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.

PREREQUISITES: The 3276 requires an integrated or external modem or DDS Adapter for TP attachment.

A keyboard is needed on each 3276 for diagnostic purposes.

Bibliography: See KWIC Index, G320-1621, or specific system bibliography.

SPECIFY: [1] Voltage (120 V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug. If standard 2.8 meter (9 foot) power cable is not desired, specify #9511 for 1.8 meter (6 foot) cable, #9512 for 3.7 meter (12 foot) cable, or #9513 for 4.5 meter (15 foot) cable.

[2] Communication Cable: A 6.1 meter (20 foot) communication cable is provided as standard for attachment to a standalone modem, or to a communication facility when a DDS Adapter or an integrated modem is used. If standard 6.1 meter (20 foot) communication cable is not desired, specify: #9061 for 3.0 meter (10 foot) cable, #9062 for 9.1 meter (30 foot) cable, or #9063 for 12.2 meter (40 foot) cable. A 1.8 meter (6 foot) communication cable (loop station connector cable) is provided as standard for attachment to a direct or data link attached loop. If standard cable is not desired, specify #9405 for 4.3 meter (14 foot) cable.

[3] Character Set: Specify one;

#9082 -- for EBCDIC character set -- used in conjunction with 75 Key Typewriter Keyboard (#4621), Data Entry Keyboard (#4622 or #4623), 87 Key EBCDIC Typewriter Keyboard (#4627), EBCDIC Typewriter/APL Keyboard (#4626), or EBCDIC Typewriter/Text Keyboard (#4629).

#9084 -- for ASCII Character Set (B) -- used in conjunction with 75 Key ASCII Typewriter Keyboard (#4624), or 87 key ASCII Typewriter Keyboard (#4628).

[4] System Attachment: identify the host processor(s) by specifying the following codes: (Note: See GSD manual for codes for use with System/3.)

Processor	Code	Processor	Code
2030	#9572	3148	#9596
2040	#9573	3155, 3155 II	#9583
2050	#9575	3158, 3158MP	#9587
2065	#9576	3165, 3165 II	#9584
2075	#9578	3168, 3168MP	#9588
3115	#9589	3195	#9580
3125	#9586	3031	#9599
3135	#9581	3032	#9598
3138	#9595	3033	#9597
3145	#9582	3791	#9253
		4331	#9606
		4341	#9607
		8100 System	#9600

PRICES:	Mdl	MRC	MLC 2 Yr	Purchase	MMMM
3276	1	\$167	\$142	\$6,390	\$32.00
	2	172	146	6,570	33.00
	3	176	150	6,750	34.00
	4	181	154	6,930	34.50
	11	167	142	6,390	28.00
	12	172	146	6,570	28.50
	13	176	150	6,750	29.00
	14	181	154	6,930	29.50

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 55% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Customer Set-Up: Yes.

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From	To	2	3	4	11	12	13	14
1		\$1,080	\$1,110	\$1,140	\$ 880	\$1,400	\$1,460	\$1,520
2		-	1,110	1,140	-	880	1,400	1,460
3		-	-	1,140	-	-	880	1,400
4		-	-	-	-	-	-	880
11		-	-	-	-	610	650	710
12		-	-	-	-	-	650	710
13		-	-	-	-	-	-	710

SPECIAL FEATURES

ADDRESS KEYLOCK (#1009). Controls access to the unit address switches (and transmit level switches) which are located in the Operator Panel Drawer. **Maximum:** One. **Field Installation:** Yes.

APL/TEXT CONTROL (#1067). Provides the control for 3276, 3278, or 3287 with APL/Text feature or 3289 with Text Print feature. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Extended Function Base (#1068).

EXTENDED FUNCTION BASE (#1068). Allows the addition of APL/Text Control (#1067) feature. **Limitation:** Cannot be installed with Encrypt/Decrypt (#3680) or SDLC/BSC Switch (#6315). **Maximum:** One. **Field Installation:** Not recommended.

AUDIBLE ALARM (#1090). An alarm, sounded under program control, to alert the operator to a special condition. This alarm, during keyboard operation, is also sounded when a character is entered into the next-to-last position on the screen. The operator may adjust the volume of the tone. **Maximum:** One. **Field Installation:** Yes.

APL/TEXT (#1120). Provides the capability for display of the 222 character APL/Text set including the 94 character EBCDIC set. **Maximum:** One. **Field Installation:** Yes. **Corequisite:** 87-key EBCDIC Typewriter/APL Keyboard (#4626) or 87-key EBCDIC Typewriter/Text Keyboard (#4629). **Limitations:** This feature is only valid when installed with the APL/Text Control (#1067). This feature is EBCDIC only and is NOT compatible with ASCII. **Prerequisite:** Extended Character Set Adapter (#3610); EBCDIC Character Set specify #9082.



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TERMINAL ADAPTER (#3255, 3256, 3257).

- #3255 -- Terminal Adapter No. 1, enables attachment of two terminals (3278s, 3287s and/or 3289s). **Maximum:** One. **Limitations:** See Attachment Matrix below for 3278 model restrictions.
- #3256 -- Terminal Adapter No. 2, enables attachment of two terminals (3278s, 3287s and/or 3289s). **Prerequisite:** Terminal Adapter No. 1 (#3255). **Maximum:** One. **Limitations:** See Attachment Matrix below for 3278 model restrictions.
- #3257 -- Terminal Adapter No. 3, enables attachment of two terminals (3278s, 3287s and/or 3289s). **Prerequisite:** Terminal Adapter No. 2 (#3256). **Maximum:** One. **Limitations:** See Attachment Matrix below for 3278 model restrictions.

3276/3278 Attachment Matrix

3276 Model	---- 3278 Model ----			
	1	2	3	4
1	Yes	No	No	No
11	Yes	Yes	Yes	Yes
2	Yes	Yes	No	No
12	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	No
13	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes
14	Yes	Yes	Yes	Yes

NOTE: 3276 mdl 1, 2, 3 (with SDLC/BSC Switch) in SDLC mode will support the same 3278 models as the mdls 11, 12 and 13.

Field Installation: Yes. **Note:** The 3276 provides a display and a port for attaching one terminal, a 3278, 3287 or 3289. The 3276 with the three Terminal Adapters (#3255, #3256, #3257) thus allows a maximum cluster size of eight displays or printers.

EXTENDED CHARACTER SET ADAPTER (#3610). Provides the additional control and buffering necessary for the extended character set in the APL/Text (#1120) feature. **Maximum:** One. **Field Installation:** Yes. **Corequisite:** APL/TEXT (#1120). **Prerequisite:** APL/Text Control (#1067).

ENCRYPT/DECRYPT (#3680). Provides a hardware implementation of the Federal Data Encryption Standard algorithm to encrypt and decrypt data messages under a 56-bit key variable. When used in conjunction with the ACF/VTAM Encrypt/Decrypt feature (Feature Number 6010, Program Number 5735-RC2) and the IBM Programmed Cryptographic Facility Program Product (Program Number 5740-XY5), data transmitted over unprotected communications lines can be safe-guarded through cryptography. **Limitations:** 3276 mdls 11, 12, 13 and 14 only. Cannot be installed with Extended Function Base (#1068). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Security Keylock (#6340). **Note:** A mercury battery, IBM part no. 1743456, or equivalent is needed. A battery is shipped with this feature. See M10000 pages for additional or replacement battery. Replacement of the discharged battery is the customer's responsibility. The discharged battery should be returned to IBM.

KEYBOARD (#4621 - 4629). One is needed on each 3276 for diagnostic testing.

- #4621 -- 75 key Typewriter Keyboard ... typewriter-like layout, movable, with 49 data keys and 26 control keys. 12 program function keys are included in the top row of data keys through use of an alternate shift key. **Prerequisite:** EBCDIC Character Set (#9082).
- #4622 -- 75 key Data Entry Keyboard ... movable, with 35 data keys, 10 program function keys and 30 control keys. **Prerequisite:** EBCDIC Character Set (#9082).
- #4623 -- 75 key Data Entry Keyboard ... keypunch layout, movable, with 35 data keys, 10 program function keys and 30 control keys. This is the recommended keyboard for high volume data entry. **Prerequisite:** EBCDIC Character Set (#9082).
- #4624 -- 75 key ASCII Typewriter Keyboard ... ASCII typewriter layout, movable, with 49 data keys and 26 control keys. 12 program function keys are included in the top row of the data keys through use of an alternate shift key. **Prerequisite:** ASCII Character Set (B) (#9084).
- #4626 -- 87 key EBCDIC Typewriter/APL Keyboard ... an 87-key EBCDIC typewriter keyboard (ref #4627) with modified keytops to allow entry of 81 APL specific characters in addition to the 94 character EBCDIC set. An APL On/Off key controls whether the keyboard is in EBCDIC typewriter or APL mode. In contrast to the 87-key EBCDIC typewriter keyboard without APL (ref #4627), this keyboard has only twelve program function keys (PF1 thru PF12) which are the group of twelve keys to the right of the main keyboard area. **Prerequisites:** APL/Text (#1120); EBCDIC Character Set (#9082).

#4627 -- 87 key EBCDIC Typewriter Keyboard ... typewriter-like layout, movable, with 49 alphameric data keys, 26 control keys, and 12 program function keys (24 total P.F. keys). Twelve of the program function keys are included in the top row of data keys through the use of an alternate shift key. **Prerequisite:** EBCDIC Character Set (#9082).

#4628 -- 87 key ASCII Typewriter Keyboard ... ASCII typewriter-like layout, movable, with 49 alphameric data keys, 26 control keys, and 12 program function keys (24 total P.F. keys). Twelve of the program function keys are included in the top row of data keys and are available through the use of an alternative shift key. **Prerequisite:** ASCII Character Set (B) (#9084).

#4629 -- 87 key EBCDIC Typewriter/Text Keyboard ... an 87-key EBCDIC typewriter keyboard (ref #4627) with modified keytops to allow entry of 65 Text specific characters in addition to the 94 character EBCDIC set. A Text On/Off key controls whether the keyboard is in EBCDIC typewriter or Text mode. In contrast to an 87-key EBCDIC typewriter keyboard without Text (ref #4627), this keyboard has only twelve program function keys (PF1 thru PF12) which are the group of twelve keys to the right of the main keyboard area. **Prerequisites:** APL/Text (#1120); EBCDIC Character Set (#9082).

Maximum: One. **Field Installation:** Yes. The keyboard is set up by the customer. **Specify:** If standard 0.9 meter (3 foot) keyboard cable is not desired, specify #9399 for 1.8 meter (6 foot) cable. **Limitation:** Keyboards used on 3275/3277 machines are not interchangeable with keyboards used on 3276/3278 machines.

KEYBOARD NUMERIC LOCK (#4690). Provides any Keyboard with the ability to lock the keyboard if a non-numeric key [other than 0-9, minus, (-), decimal sign, or dup] is depressed in a pre-defined numeric-only field. **Maximum:** One. **Field Installation:** Yes.

MAGNETIC READER CONTROL (#4999). Provides the capability of attaching a Magnetic Slot Reader which reads encoded information (numeric only) from a magnetic stripe. **Maximum:** One; **Field Installation:** Yes.

SDLC/BSC SWITCH (#6315). [Mdls 1 - 4 only] Provides SNA/SDLC transmission control in addition to the basic Binary Synchronous Communications (BSC). SDLC or BSC can be selected by the operator with a switch on the operator panel. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Extended Function Base (#1068).

SECURITY KEYLOCK (#6340). A lock and key which prevents modification or display of data in the display terminal when in the "off" position. When the Security Keylock feature is combined with the Encrypt/Decrypt feature (#3680), a third position of the lock permits modification of the 56 bit Encrypt/Decrypt key variable. **Maximum:** One. **Field Installation:** Yes.

SELECTOR LIGHT-PEN (#6350 for mdls 3, 4, 13 and 14; #6351 for mdls 1, 2, 11 and 12). A hand-held pen-like device which permits the operator to select fields of data from a display for input to the host system. The Selector Light-Pen, while not being used, can be placed in a recess of the keyboard, which is used for user's incidental items. Selector Pen (and Cursor Select) operations have been expanded to include a new designator character "8". When this designator is used the Read Modified operation results in the return of both the addresses and the data of all modified fields on the screen. The #6351 Selector Light Pen has a slightly wider field of view to facilitate operator ease-of-use. **Maximum:** One. **Field Installation:** Yes.

TELECOMMUNICATION FEATURES

For TP attachment each 3276 must be equipped with one of the Communications Features (#6301 or #6302) and either the External Modem Interface (#3701) or DDS Adapter (#5650 for point-to-point operation, #5651 for multipoint operation) or one of the 1200 bps Integrated Modem features (#5500, #5501, #5502, #5507 or #5508). In addition, the SDLC/BSC Switch (#6315) may be selected on mdls 1, 2, 3 or 4 (see above). For loop attachment (3276 mdls 11, 12, 13 and 14 only) each 3276 must be equipped with the Communications Feature without Business Machine Clock (#6302) and the Loop Adapter (#4850).

EXTERNAL MODEM INTERFACE (#3701). Provides an EIA/CCITT interface for attachment of an IBM or other external modem. **Specify:** #9490 for operation on the public switched network (mdls 11, 12, 13, 14), or #9491 for operation on private non-switched communication facilities. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be ordered with #4850, #5500, #5501, #5502, #5507, #5508, #5650 or #5651. **Prerequisite:** Communication Feature With or Without Business Machine Clock (#6301 or #6302).

LOOP ADAPTER (#4850). [Mdls 11-14 only] Provides the capability to attach to either a direct or data link attached loop of the 8100 System. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be ordered with #3701, #5500, #5501, #5502, #5507, #5508, #5650 or #5651. **Prerequisite:** Com-

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communications Feature without Business Machine Clock (#6302).

1200 BPS INTEGRATED MODEM, NON-SWITCHED (#5500). Provides an integrated modem for operation over non-switched communications facilities at speeds of 1200/600 bps. No external modem is required. **Specify: #9651** for use with 4-wire facility or **#9652** for use with 2-wire facility. **Maximum: One.** **Field Installation:** Yes. **Limitation:** Cannot be ordered with #3701, #4850, #5501, #5502, #5507, #5508, #5650 or #5651. **Prerequisite:** Communications Feature with Business Machine Clock (#6301).

1200 BPS INTEGRATED MODEM, SWITCHED, AUTO ANSWER (#5501). [Models 11, 12, 13, 14 only] Provides an integrated modem with auto/manual answer capabilities for operation over switched communication facilities at speeds of 1200/600 bps. No external modem is required. **Prerequisite:** Communication Feature with Business Machine Clock (#6301). **Limitation:** Cannot be ordered with #3701, #4850, #5500, #5502, #5507, #5508, #5650 or #5651. **Field Installation:** Yes. **Note:** This feature requires a CBS type data access arrangement or FCC registered equivalent.

1200 BPS INTEGRATED MODEM, SWITCHED, MANUAL ANSWER (#5502). [mdls 11, 12, 13, 14 only] Provides an integrated modem for communications with a remote CPU over the public switched telephone network at speeds of 1200/600 bps. No external modem is required. **Maximum: One.** **Field Installation:** Yes. **Limitation:** Cannot be ordered with #3701, #4850, #5500, #5501, #5507, #5508, #5650 or #5651. **Prerequisite:** Communications Feature with Business Machine Clock (#6301). **Note:** This feature requires a data access arrangement type CDT, or FCC registered equivalent.

1200 BPS INTEGRATED MODEM, NON-SWITCHED WITH SWITCHED NETWORK BACKUP (#5507). Provides an integrated modem at speeds of 1200/600 bps for operation over non-switched communications facilities, and also provides manual switched network backup capability. No external modem is required. **Specify: #9651** for communication over 4-wire facility or **#9652** for communication over 2-wire facility. **Maximum: One.** **Field Installation:** Yes. **Limitation:** Cannot be ordered with #3701, #4850, #5500, #5501, #5502, #5508, #5650 or #5651. **Prerequisite:** Communications Feature with Business Machine Clock (#6301). **Note:** This feature requires a data access arrangement type CDT, or FCC registered equivalent, for switched network backup operation.

1200 BPS INTEGRATED MODEM, NON-SWITCHED WITH SWITCHED NETWORK BACKUP, AUTO ANSWER (#5508). Provides an integrated modem for operation over non-switched communication facilities at speed of 1200/600 bps and also provides auto/manual answer switched network backup capabilities. No external modem is required. **Specify: #9651** for communications over 4-wire facility, or **#9652** for communications over 2-wire facility. **Prerequisite:** Communications Feature with Business Machine Clock (#6301). **Limitation:** Cannot be ordered with #3701, #4850, #5500, #5501, #5502, #5507, #5650 or #5651. **Field Installation:** Yes. **Note:** This feature requires a CBS type data access arrangement or FCC registered equivalent.

DIGITAL DATA SERVICE (DDS) ADAPTER (#5650 for point-to-point operation, #5651 for multipoint operation). An adapter for BSC or SDLC data transmission at a speed of 2400 bps, 4800 bps, or 9600 bps (mdls 11-14 only) over the AT&T non-switched Dataphone* digital data service network. The DDS Adapter interfaces to a DDS channel service unit, the customer site termination of the DDS network. **Limitation:** Cannot be installed with #3701, #4850, #5500, #5501, #5502, #5507 or #5508. **Field Installation:** Yes. See 3276 Specify [2] -- Communication Cable. **Maximum: One** #5650 or #5651. **Prerequisite:** Communications Feature without Business Machine Clock (#6302) with Specify Code #9822 for 2400 bps, or #9823 for 4800 bps, or #9825 for 9600 bps (mdls 11-14 only).

COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCK (#6301). Required for attachment to communications facilities through any 1200 bps Integrated Modem, or the External Modem Interface (#3701) at 1200 bps, to any external modem that does not provide its own clocking. **Maximum: One.** **Field Installation:** Yes. **Limitation:** Cannot be ordered with #6302.

COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCK (#6302). Required for attachment to communications facilities, at speeds up to 9600 bps using SDLC, or up to 7200 bps using BSC, through the External Modem Interface (#3701) and any external modem that provides its own clocking, or through the DDS Adapter. It is also required for attachment of the 3276 mdls 11, 12, 13 and 14 to a direct or data link attached loop of the 8100 System, at a speed of 9600 or 2400 bps respectively. **Specify: #9821** for 2000 bps, **#9822** for 2400 bps, **#9823** for 4800 bps, **#9824** for 7200 bps, or **#9825** for 9600 bps. **Maximum: One.** **Field Installation:** Yes. **Limitation:** Cannot be ordered with #6301.

* Trademark of American Telephone & Telegraph Co. (AT&T).

Special Feature Prices:	MRC		MLC		Purchase	MMMC
		2 yr		2 yr		
Address Keylock	#1009	\$60	SUC -	\$ 60		N/C
APL/Text Control	1067	29	25	1,125		.50
Extended Function Base	1068	6	5	225		.50
Audible Alarm	1090	2	2	90		N/C
APL/Text	1120	9	8	360		.50
Terminal Adapter No. 1	3255	16	14	630		\$1.50
Terminal Adapter No. 2	3256	16	14	630		1.50
Terminal Adapter No. 3	3257	16	14	630		1.50
Ext Character Set Adapter	3610	11	9	405		2.50
Encrypt/Decrypt	3680	49	42	1,710		2.50
External Modem Interface	3701	12	10	400		4.00
Keyboard						
75 Key Typewriter	4621	13	11	495		2.50
75 Key Data Entry	4622	13	11	495		3.50
75 Key Data Entry (Keypunch Layout)	4623	13	11	495		3.50
75 Key ASCII Typewriter	4624	13	11	495		2.50
87 Key EBCDIC Typewriter/APL	4626	18	15	675		3.50
87 Key EBCDIC Typewrtr	4627	18	15	675		3.00
87 Key ASCII Typewriter	4628	18	15	675		3.00
87 Key EBCDIC Typewriter/Text	4629	18	15	675		3.50
Keyboard Numeric Lock	4690	N/C	N/C	N/C		N/C
Loop Adapter	4850	25	21	945		3.50
Magnetic Reader Control	4999	11	9	405		4.50
1200 bps Integrated Modem,						
Non-switched	5500	19	16	668		5.00
Switched, Auto Answer	5501	25	21	840		3.00
Switched, Manual Answer	5502	19	16	668		4.00
Non-Sw w Switched Network						
Backup	5507	26	22	910		7.00
Non-Sw w Switched Network						
Backup, Auto Answer	5508	29	25	1,015		4.00
DDS Adapter, pt-to-pt	5650	24	20	840		2.00
DDS Adapter, multipoint	5651	24	20	840		2.00
Communications Feature						
w Business Machine Clk	6301	19	16	670		3.00
w/o Business Mach Clk	6302	12	10	450		2.50
SDLC/BSC Switch	6315	21	18	810		3.00
Security Keylock	6340	35SUC -		35		N/C
Selector Light-Pen	6350	15	13	585		.50
Selector Light-Pen	6351	15	13	585		.50

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the Feature Number as shown below at the price listed in the M10000 pages. See M10000 pages for additional information and for field installation.

Item	Feature Number	Maximum Quantity
Magnetic Slot Reader	#9441	*
Magnetic Reader Extension Cable		
19.7 ft (6 meter)	#9106	**
39.4 ft (12 meter)	#9107	**

* A maximum of one Magnetic Slot Reader may be ordered.

** A maximum of one extension cable may be ordered.

MERCURY BATTERY (Part No. 1743456). Provides power to sustain the master key of the Encrypt/Decrypt feature (#3680) when normal power is not present. This supply item is a 4.14 volt non-rechargeable mercury battery. This battery has a shelf life of 1 year under normal conditions, and can be expected to provide 3.5 years of normal operation. **Note:** Discharged battery should be returned to IBM. **Field installation:** Yes. **Limitation:** Can be installed on 3276 mdls 11, 12, 13 and 14 only. **Prerequisite:** Encrypt/Decrypt feature (#3680).

MAGNETIC SLOT READER (#9441/Part No. 4123500). A free standing Magnetic Slot Reader (MSR) that reads encoded information from a magnetic stripe. It attaches by a 1.5 meter cable thru the Magnetic Reader Control (#4999). The MSR has 3 lights and a buzzer which provide feedback to the user on the status of the read data. The MSR accommodates a wide range (height and length) of magnetic striped plastic cards such as: ID badges, security operator identification cards, etc. Using the 3275/3277 like 10-numeric character set, the maximum number of data characters that can be read are 7 to 37 characters at 75 bpi or 210 bpi, and 7 to 100 characters at 127 bpi. A minimum of seven characters must be encoded between the start sentinel and end sentinel characters.

The following cable assemblies can be used to extend the Magnetic Slot Reader distance. **Limitation:** Extension cables CANNOT be plugged into other extension cables.



DP Machines

M 3276.5
Jul 79

3276 Control Unit Display Station (cont'd)

Description:

19.7 feet (6 meters) -- #9106/Part No. 4832986
39.4 feet (12 meters) -- #9107/Part No. 4832987

A variety of magnetic documents, tags, and labels that the MSR can read, may be obtained from IRD, some of which, depending on length, can be encoded by devices such as the IBM 3642 Encoder Printer.

Note: Magnetic cards encoded with the Alternate End of Message character (hexidecimal "C") cannot be read by this reader. SSCP-LU communication for MSR is not supported *when the MSR is attached to a 3276 or a 3278 which is attached to a 3276.*

Limitation: Valid for numeric only data *encoded according to the American National Standard entitled "Magnetic Strip Encoding for Credit Cards, ANSI x4.16 - 1973" when the MSR is attached to a 3276 or to a 3278 which is attached to a 3276.* **Prerequisite:** Magnetic Reader Control (#4999).

[reverse side is blank]

IBM 3277 DISPLAY STATION

Purpose: A high-performance cathode-ray tube used in clusters with the 3271, 3272 or 3274 Control Unit for displaying alphanumeric data, and for entering data into and retrieving data from a S/360, S/370, 4300 Processor, 8100 Information System or 3790 Communication System. A keyboard or light-pen or both permit an operator to display and manipulate data on the screen in a highly flexible and efficient manner. With its comprehensive and powerful set of standard and optional features, the 3277 meets both general-purpose and unique display requirements.

NOTE: For possible use with System/3, see GSD Manual.

Model 1 For use with the 3271 mdl 1, 2, 11 or 12 or 3272 mdl 1 or 2 or 3274 mdl 1A, 1B, 1C or 1D to display up to 480 characters ... 12 lines of 40 characters each. For use with 3790 or 8100, see below.

Model 2 For use with the 3271 mdl 2 or 12 or 3272 mdl 2 or 3274 mdl 1A, 1B, 1C or 1D to display up to 1,920 characters ... 24 lines of 80 characters each. For use with 3790 or 8100, see below.

NOTE: 3277 mdl 1 and 2 displays may be intermixed on a 3271 mdl 2 or 12, 3272 mdl 2, or 3274 mdl 1A, 1B, 1C or 1D. In this configuration, each 3277 mdl 1 will display 480 characters supplied by the CPU to the 1,920 character buffer in the 3271, 3272 or 3274. 3277 mdl 1s and 2s may not be intermixed on a 3271 mdl 1 or 11, or 3272 mdl 1, or 3791. 3277 mdl 1 and 2 displays may be intermixed on the 8100 System via the 8101 Storage and Input/Output Unit.

Model Changes: Available at time of manufacture only.

Highlights: Displays sixty-three 7 x 9 dot-matrix characters ... 36 alphameric, 27 special characters, including the space. Features Data-Field Organization which permits individual fields of data on the screen to be program-defined with various attributes such as protected or unprotected, alphameric or numeric, normal intensity, non-displayed, or brightened intensity, and selector light-pen detection-allowed or disallowed.

Editing Features -- typematic, cursor, tab, back-tab, protected-data, insert and delete, and extended-erase (erase to end-of-field, erase all keyboard input data, erase entire screen) are standard features for displays equipped with a keyboard.

Input Flexibility -- a choice of keyboards, a selector light-pen, and a set of program function keys provide unmatched input flexibility ... see "Special Features" below.

Output Flexibility -- information on the screen can be directed to another display or hard copy device under program control.

Security Enhancement Features -- a special Non-displayed Keying Mode (standard) provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock (optional) prevents modification of data on the display unless the key is turned to the "on" position. An Operator Identification Card Reader (optional) is provided to enter system user identification. This enhances the (programmed) control of his access to data and audit of his actions. It may also be used to enter any sequence of characters (pre-recorded on a card) for other purposes such as transaction control, account control, and billing.

For use with the 8100 Information System: For special features that are supported, see M 8101 pages. A 3271 or 3272 is not required when the 3277 mdl 1 or 2 is attached to the 8101 with #1505 or #1506. For character set, specify #9089. For power, see Specify [1] below. For cables, see M10000 pages for 8100 System. Most programs written for the 3270 are not supported by the 8100 System.

For use with 3790 Communication System: For special features that are supported, see 3791. A 3271, 3272 or 3274 is not required when the 3277 mdl 1 or 2 is attached to the 3791. For character set, specify #9089. For power, see Specify [1] below. For cables, see M 10000 pages for 3790.

Maximum: Up to thirty-two 3277s can be attached to a 3271 or 3272. Up to sixteen 3277s can be attached to a 3274. The maximum is reduced by one on a 3271 or a 3272 for each 3284 mdl 1, 2, 3286 mdl 1, 2, 3287, or 3288 Printer attached. The maximum is reduced by one on a 3274 for each 3284 mdl 1, 2, 3286 mdl 1, 2, 3287, or 3288 Printer attached through Terminal Adapter #7802 through #7805 ... see 3271, 3272 or 3274. Up to 24 - 3277 mdls 1 or 2 can be attached to the 8101 of the 8100 System. This maximum is reduced by one for each 3284, 3286 or 3288 attached to the 8101. See M 8101 pages.

PREREQUISITES: For Model 1 -- a 3271 mdl 1, 2, 11 or 12, a 3272 mdl 1 or 2, a 3274 mdl 1A, 1B, 1C or 1D with appropriate Device/Terminal Adapters, or a 8101 with #1505 or #1506 ... see 3271, 3272, 3274 or 8101 pages.

For Model 2 -- a 3271 mdl 2 or 12, a 3272 mdl 2, a 3274 with appropriate Device/Terminal Adapters, or a 8101 with #1505 or #1506 ... see 3271, 3272, 3274 or 8101 pages.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Cables: See M 10000 pages for 3277 cable prices and ordering instructions. For cable specifications, see 3270 *Installation Manual - Physical Planning*, GA27-2787.

[3] Character Set: Specify one of the following unless Data Analysis-APL Feature (#1066) is selected;

#9089 -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC keyboard. **PREREQUISITE:** If used with the 3271 mdl 1 or 2, EBCDIC Transmission Code (#9761) is a prerequisite on the 3271 mdl 1 or 2.

#9091 -- for ASCII Character Set (A) (available at time of manufacture only) ... provides the 64 ASCII characters but substitutes the Logical OR (|) and Logical NOT (~) for the exclamation mark (!) and circumflex (^). **PREREQUISITE:** If used with the 3271, ASCII Transmission Code (#9762 or #1200) is a prerequisite on the 3271.

#9092 -- for ASCII Character Set (B) (available at time of manufacture only) ... provides the standard 64 ASCII characters. **PREREQUISITE:** If used with the 3271, ASCII Transmission Code (#9762 or #1200) is a prerequisite on the 3271.

[4] Console Use with System/3 mdl 15 (mdl 1 only). #9590 for System/3 mdl 15 console use.

PRICES:	Mdl	MAC/ MRC	MLC 2 year	Purchase	MMMC
	1	\$ 71	\$ 60	\$2,470	\$ 9.00
	2	103	88	3,200	19.50

Plan Offering: Plan B Warranty: B Machine Group: A
 Purchase Option: 60% Useful Life Category: 2 Per Call: 1
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 5%

SPECIAL FEATURES

DATA ANALYSIS-APL FEATURE (#1066). [Mdl 2 only and attached to 3271, 3272] Provides dual case EBCDIC, the APL set, and (for output only) 120 TN print train (see Type Catalog, S/370 Printers) characters. 93 TN characters are input and output both, 27 are output only. **Field Installation:** Yes.

AUDIBLE ALARM (#1090). An alarm, sounded under program control, to alert the operator to a special condition. This alarm during keyboard operation, is sounded when a character is entered into the next to last position on the screen. **Maximum:** One. **Field Installation:** Yes.

OPERATOR IDENTIFICATION CARD READER (#4600). Provides the capability of reading a 2-1/8 inch x 3-3/8 inch (53.9mm x 85.7mm) plastic data processing card with an encoded magnetic stripe. Using the 10-numeric character set, the number of characters that can be read is 1-37 characters at 75 BPI (bits per inch).

Prerequisite: Any keyboard. **Maximum:** One. **Field Installation:** Yes.

KEYBOARD (#4630 thru #4639).

#4630 -- 66 key EBCDIC Typewriter Keyboard, typewriter-like layout, movable, with 45 alphameric keys and 21 control keys. **Prerequisite:** EBCDIC Character Set (#9089).

#4631 -- 66 key EBCDIC Data Entry Keyboard, movable, with 36 alphameric keys and 30 control keys. **Prerequisite:** EBCDIC Character Set (#9089).

#4632 -- 78 key Operator Console Keyboard, operator-console layout, movable, with 45 alphameric keys, 21 control keys, and 12 program keys. **Prerequisite:** EBCDIC Character Set (#9089).

#4633 -- 78 key EBCDIC Typewriter Keyboard, 66 key EBCDIC typewriter layout with 12 additional program function keys, movable. **Prerequisite:** EBCDIC Character Set (#9089).

#4634 -- 66 key ASCII Typewriter Keyboard, ASCII typewriter layout, movable, with 45 alphameric keys and 21 control keys. **Prerequisite:** ASCII Character Set (A) (#9091) or (B) (#9092).

#4635 -- 78 key ASCII Typewriter Keyboard, 66 key ASCII typewriter layout with 12 additional function keys, movable. **Prerequisite:** ASCII Character Set (A) (#9091) or (B) (#9092).

#4636 -- 66 key EBCDIC Data Entry Keyboard, keypunch layout, movable, with 36 alphameric keys and 30 control keys. This is the recommended keyboard for Data Entry including Video 370. **Prerequisite:** EBCDIC Character Set (#9089).

#4637 -- 66 key EBCDIC Typewriter/APL keyboard with 45 alphameric and 21 control keys. **Prerequisite:** EBCDIC/APL characters via special feature (#1066).



3277 Display Station (cont'd)

#4638 - 78 key EBCDIC Typewriter/APL keyboard with 45 alphameric keys, 21 control keys, and 12 program keys. **Prerequisite:** EBCDIC/APL characters via special feature (#1066).

#4639 - 78 key EBCDIC Fast Cursor Text Keyboard, with 45 alphameric keys, 21 control keys, and 12 program keys. The speed of the Cursor and Typamatic key operation is approximately twice that of a non-Text keyboard. Includes Typamatic Delete and a function similar to typewriter carriage return. **Prerequisite:** Data Analysis - APL Feature (#1066) on 3277 mdl 2 as well as on a control unit (only 3271-2 or 12, or 3272-2).

Maximum: One. **Field Installation:** Yes.

KEYBOARD NUMERIC LOCK (#4690). Provides the ability to lock the keyboard if a non-numeric key [other than 0-9, minus (-), period (.), or dup] is depressed in a pre-defined numeric-only field. **Maximum:** One. **Field Installation:** Yes.

SECURITY KEYLOCK (#6340). A lock and key which prevents modification and display of data on the display when in the "off" position. **Maximum:** One. **Field Installation:** Yes.

SELECTOR LIGHT-PEN (#6350). A hand-held, pen-like device which permits the operator to select fields of data from a display for computer input. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:		MAC/	MLC	Purch	MMMC
		MRC	2 yr		
Data Analysis-APL Feature	#1066	\$ 25	\$ 21	\$ 504	\$ 1.00
Audible Alarm	1090	4	3	145	.50
Operator Ident Card Reader	4600	13	11	437	3.50
Keyboard,					
66 Key EBCDIC Typewriter	4630	13	11	520	5.00
66 Key EBCDIC Data Entry	4631	13	11	520	6.00
78 Key Operator Console	4632	32	27	1,010	14.00
78 Key EBCDIC Typewriter	4633	28	24	869	8.50
66 Key ASCII Typewriter	4634	13	11	520	5.00
78 Key ASCII Typewriter	4635	28	24	869	8.50
66 Key EBCDIC Data Entry (keypunch layout)	4636	15	13	522	6.00
66 Key EBCDIC APL/Type	4637	26	22	807	5.50
78 Key EBCDIC APL/Type	4638	40	34	1,250	9.50
78 Key EBCDIC Fast Cursor Text	4639	40	34	1,250	8.50
Keyboard Numeric Lock	4690	NC	NC	NC	NC
Security Keylock	6340	35SUC	-	35	NC
Selector Light-Pen	6350	24	20	728	1.50



Purpose: An enhanced, cathode-ray tube (CRT), display station used in clusters with the 3274 Control Unit or the 3276 Control Unit Display Station for displaying alphanumeric data, and for entering data into and receiving data from a S/360, a S/370, 4300 Processor, a 3790 Communication System or a 8100 Information System. A Keyboard, Selector Light-pen or both permit an operator to display and manipulate data on the screen in a flexible and efficient manner. With its set of basic and optional features, the 3278 meets both general purpose and unique display requirements.

NOTE: For use with the System/3, see GSD manual.

- Model 1** For use with 3274 or 3276 to display up to 960 characters ... 12 lines of 80 characters each.
- Model 2** For use with 3274 or 3276 or to attach to the 4331 Processor via the standard Display/Printer Adapter or optional Display/Printer Adapter Expansion. Displays up to 1920 characters ... 24 lines of 80 characters each.
- Model 3** For use with 3274 or 3276 to display up to 2560 characters ... 32 lines of 80 characters each.
- Model 4** For use with 3274 or 3276 to display up to 3440 characters ... 43 lines of 80 characters each.
- Model 5** For use with 3274 mdl 1A, 1C or 1D to display up to 3564 characters ... 27 lines of 132 characters each.

For use with the 3790 Communication System: *The 3791 Controller only supports the 3278 mdl 2. See the 3791 Configurator, GA27-2768-6, for additional information.*

For use with the 8100 Information System: *See the System Configurator, GA27-2876.*

Highlights: Displays a character within a 7 x 14 character matrix in 960, 1920 and 2560 character models; within a 7 x 11 character matrix in the 3440 and 3564 character models. The basic 26 character upper case letters are presented in a 7x9 character matrix for the 960, 1920 and 2560 character models, and in a 7x8 character matrix for the 3440 and 3564 character models. Displays a 94 character set: 26 upper case alphabetic, 26 lower case alphabetic, 10 numeric and 32 special characters. A mono-case switch provides the capability of switching to upper case alphabetic mode for 3277 compatibility. Uses 3270 field formatting capability which permits individual fields of data on the screen to be program defined with various attributes such as protected/unprotected, alphanumeric, normal/highlighted intensity, displayable/non-displayable, and selector light-pen detection allowed/disallowed.

The operator may initiate a local display-to-printer copy function (i.e., without host intervention) from the keyboard of a 3278. When the 3278 is attached to a 3274 Control Unit, the printer designation is controlled by operator use of the IDENT key and (a) by a printer authorization matrix which is loaded into the 3274 Control Unit through a user written host application program, or (b) by a customer definable matrix loaded from the system diskette at IML time. For further details see the *IBM 3270 Information Display System Planning and Setup Guide, GA27-2827*. When the 3278 is attached to a 3276 Control Unit Display Station, the printer designation is controlled by the operator use of the IDENT key and by a configuration default matrix. This matrix is determined by the relative positions of devices attached to the 3276. (The host can perform a copy in a manner compatible with existing 3271/3272 support.)

Operator Factors -- the 3278 has a anti-glare screen. Indicators are displayed on the bottom row of the screen, outside the data display area, and provide useful operator information. Host display of data on the screen is accomplished without refresh interrupt (i.e., no blinking). The keyboard, which is low in profile, provides a palm rest area and has separators to help prevent accidental striking of control keys. The operator may select one of several cursor modes.

Editing Functions -- Cursor move, tab, home key, back tab, insert, delete, extended erase (erase to end-of field, erase all keyboard input data, and erase entire screen), and cursor select keys are all basic for displays equipped with a keyboard. All alphanumeric, special symbol, and cursor move keys have typamatic capability. Double speed cursor typamatic is attained with a simultaneous depressing of the ALT key and a horizontal cursor positioning key. The cursor select function provides an alternative to the Selector Light-pen function. Fields of data may be selected by positioning the cursor and then using the Cursor Select Key:

Input Flexibility -- a choice of keyboards or the selector light-pen provide input flexibility. A Magnetic Slot Reader (optional) and, for 3278's attached to a 3274 Control Unit, a Magnetic Hand Scanner (optional) provide for the input of magnetically encoded

data ... see "Special Features" below. Fields of data can be selected by positioning the cursor and operating the cursor select key, instead of using the Selector Light-Pen. Twelve Program Function (P.F.) keys are basic with all typewriter keyboards.

Security Functions -- a special non-displayed input mode provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock (optional) prevents modification or display of data in the display terminal unless the key is turned to the "on" position. These capabilities and the terminal's ability to identify itself to the host program allow customer supplied security program routines to control access to data and audit of actions. A Magnetic Slot Reader (optional) and, for 3278's attached to a 3274 Control Unit, a Magnetic Hand Scanner (optional) are available to enter system user identification.

When attached to the 4331 Processor via the standard Display/Printer Adapter or optional Display/Printer Adapter Expansion, functional support varies from that of the 3278-2 attached to a 3274 or 3276. See M 4331 pages for details of support.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This increased availability has been achieved through the use of problem determination and recovery procedures that are easily understood and used by the operator. The procedures are provided by the Problem Determination Guide manual that will be stored under the keyboard palm rest. Also, see "Customer Responsibilities" below.

Customer Set-Up (CSU): The 3278 is designated Customer Set-Up thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at the customer's receiving dock, unpacking and placement of the 3278.
- Physical set-up, connection of cables in protected customer access areas, switch settings, and checkout.
- Contact Field Engineering to make cable connections of IBM CSU units to non-CSU units where customer access areas are not provided.
- Notify IBM of intent to relocate and follow IBM instructions for relocation.
- Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.
- Disconnecting, packing and removal to the customer's shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.

PREREQUISITES: The 3278 requires a 3274 or 3276 with appropriate Terminal Adapter. *3278 mdl 5 requires Configuration Support B (#9111) on the 3274 to which it is attached. ... see 3274 or 3276 Machines pages.* When attached to the 3790 Communication System or the 8100 System via the 3276 Control Unit, all 3278 display units must have a keyboard.

Bibliography: See KWIC Index, G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (120 V AC, 1-phase, 3-wire, 60 Hz): **#9890** for locking plug, or **#9891** for non-lock plug. If standard 2.8 meter (9 foot) power cable is not desired, specify: **#9511** for 1.8 meter (6 foot) cable, **#9512** for 3.7 meter (12 foot) cable, or **#9513** for 4.5 meter (15 foot) cable.

[2] Cables: See M 10000 pages for 3270 cable prices and ordering instructions. For cable specifications, see *IBM 3270 Installation Manual - Physical Planning, GA27-2787*.

[3] Character Set: For record purposes, specify one; **#9082** -- for EBCDIC Character Set -- used in conjunction with 75 Key Typewriter Keyboard (#4621), Data Entry Keyboard (#4622 or #4623), 87 Key EBCDIC Typewriter Keyboard (#4627), Typewriter/APL Keyboard (#4626) or Typewriter/Text Keyboard (#4629). **#9084** -- for ASCII Character Set (B) -- used in conjunction with 75 Key ASCII Typewriter Keyboard (#4624) or 87 Key ASCII Typewriter Keyboard (#4628).

[4] System Attachment: identify the 3274 or 3276 model this 3278 attaches to.

3274 or 3276	Code
3274 mdl 1A	#9549
3274 mdl 1B	#9550
3274 mdl 1C	#9551
3274 mdl 1D	#9261
3276 mdl 1, 2, 3, 4	#9552
3276 mdl 11, 12, 13, 14	#9553

3278 Display Station (cont'd)

PRICES:	Mdl	MRC	MLC 2 yr	Purchase	MMMC
3278	1	\$ 58	\$ 49	\$2,205	\$11.50
	2	61	52	2,340 ←	12.00
	3	71	60	2,700	13.50
	4	74	63	2,835	14.50
	5	86	73	3,285	16.50

Plan Offering: Plan B Warranty: B Machine Group: D
Purchase Option: 55% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5% Customer Set-Up: Yes.

Model Changes: Model changes from mdl 1 to any mdl; or mdl 2 to mdl 3, 4 or 5; or mdl 3 to mdl 4 or 5; or mdl 4 to mdl 5, are field installable. Model downgrades are not recommended for field installation.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	2	3	4	5
1	\$ 610	\$ 650	\$ 710	\$1,240
2		650	710	1,240
3			710	1,240
4				1,240

SPECIAL FEATURES

NOTE: Not all of the following special features are supported by 3278-2s attached to the 4331 system via the standard Display/Printer Adapter or the Display/Printer Adapter Expansion. See M 4331 pages for a list of supported special features.

AUDIBLE ALARM (#1090). An alarm, sounded under program control, to alert the operator to a special condition. This alarm, during keyboard operation, is also sounded when a character is entered into the next-to-last position on the screen. The operator may adjust the volume of the tone. **Maximum:** One. **Field Installation:** Yes.

APL/TEXT (#1120). Provides the capability for display of 222-character APL/Text Character set including the 94-character EBCDIC set. **Maximum:** One. **Field Installation:** Yes. **Corequisite:** 87-key EBCDIC Typewriter/APL Keyboard (#4626) or 87-key EBCDIC Typewriter/Text Keyboard (#4629). **Limitations:** This feature is only valid on a 3278 Display Station attached to a 3276 with APL/Text Control feature (#1067) or to a 3274 mdl 1A, 1C or 1D customized to include the APL/Text Control Function. This feature is EBCDIC only and is NOT compatible with ASCII. **Prerequisites:** Extended Character Set Adapter (#3610) and EBCDIC Character Set Specify (#9082).

SWITCH CONTROL UNIT (#1720). This feature, when installed on a 3278 Display Station, permits switching operational control of that display between two different control units. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** Yes.

EXTENDED CHARACTER SET ADAPTER (#3610). Provides the additional control and buffering necessary for the extended character set in the APL/Text (#1120) feature. **Maximum:** One. **Field Installation:** Yes. **Corequisite:** APL/Text (#1120).

KEYBOARD

#4621 -- 75 Key Typewriter Keyboard ... typewriter-like layout, movable, with 49 data keys and 26 control keys. Twelve program function keys are included in the top row of data keys through use of an alternate shift key. **Prerequisite:** EBCDIC Character Set (#9082).

#4622 -- 75 Key Data Entry Keyboard ... movable, with 35 data keys, 10 program function keys and 30 control keys. **Prerequisite:** EBCDIC Character Set (#9082).

#4623 -- 75 Key Data Entry Keyboard ... keypunch layout, movable, with 35 data keys, 10 program function keys and 30 control keys. This is the recommended keyboard for data entry. **Prerequisite:** EBCDIC Character Set (#9082).

#4624 -- 75 Key ASCII Typewriter Keyboard ... ASCII typewriter layout, movable, with 49 data keys and 26 control keys. Twelve program function keys are included in the top row of the data keys through use of an alternate shift key. **Prerequisite:** ASCII Character Set (B) (#9084).

#4626 -- 87 Key EBCDIC Typewriter/APL Keyboard ... an 87-key EBCDIC typewriter keyboard (ref. #4627) with modified keytops to allow entry of 81 APL specific characters in addition to the 94-character EBCDIC set. An APL On/Off key controls whether the keyboard is in basic EBCDIC typewriter or APL mode. In contrast to the 87-key EBCDIC typewriter keyboard without APL (ref #4627), this keyboard has only twelve program function keys (PF1 thru PF12) which are the group of twelve keys to the right of the main keyboard area. **Prerequisites:** APL/Text (#1120) and EBCDIC Character Set (#9082).

#4627 -- 87 Key EBCDIC Typewriter Keyboard ... typewriter-

like layout, movable, with 49 alphanumeric data keys, 26 control keys, and 12 program function keys (24 total P.F. keys). Twelve of the program function keys are included in the top row of data keys through the use of an alternate shift key. **Prerequisite:** EBCDIC Character Set (#9082).

#4628 -- 87 Key ASCII Typewriter Keyboard ... ASCII typewriter-like layout, movable, with 49 alphanumeric data keys, 26 control keys, and 12 program function keys (24 total P.F. keys). Twelve of the program function keys are included in the top row of data keys and are available through the use of an alternate shift key. **Prerequisite:** ASCII Character Set (#9084).

#4629 -- 87 Key EBCDIC Typewriter/Text Keyboard ... an 87-key EBCDIC typewriter keyboard (ref #4627) with modified keytops to allow entry of 65 Text specific characters in addition to the 94-character EBCDIC set. A Text On/Off key controls whether the keyboard is in EBCDIC typewriter or Text mode. In contrast to an 87-key EBCDIC typewriter keyboard without Text (ref #4627), this keyboard has only twelve program function keys (PF1 thru PF12) which are the group of twelve keys to the right of the main keyboard area. **Prerequisites:** APL/Text (#1120) and EBCDIC Character Set (#9082).

Maximum: One of the above. **Field Installation:** Yes. The keyboard is set up by the customer. **Limitation:** Keyboards used on the 3275/3277 machines are not interchangeable with keyboards used on 3276/3278 machines. Only two of the three keyboard types (Typewriter, Data Entry, or Data Entry-Keypunch like) can be supported at any one time on displays attached to a 3274 Control Unit. Text and APL keyboards are not affected by this limitation and can be installed with any of the other keyboards without restriction. **Specify:** If standard 0.9 meter (3 foot) keyboard cable is not desired, specify #9399 for 1.8 meter (6 foot) cable.

KEYBOARD NUMERIC LOCK (#4690). Provides any keyboard with the ability to lock the keyboard if a non-numeric key [other than 0-9, minus (-), decimal sign, or dup] is operated in a predefined numeric-only field. **Maximum:** One. **Field Installation:** Yes.

MAGNETIC READER CONTROL (#4999). Provides the capability of attaching a Magnetic Hand Scanner (MHS) or Magnetic Slot Reader (MSR) which reads encoded information from a magnetic stripe. The MSR can be used when the 3278 is connected to either a 3274 or 3276, but the MHS can only be used when the 3278 is connected to a 3274 Control Unit. **Maximum:** One. **Field Installation:** Yes.

SECURITY KEYLOCK (#6340). A lock and key which prevents modification or display of data in the display terminal when in the "off" position. **Maximum:** One. **Field Installation:** Yes.

SELECTOR LIGHT-PEN (#6350 for mdls 3, 4 and 5; #6351 for mdls 1 and 2). A hand-held, pen-like device which permits the operator to select fields of data from a display for input to the host system. The Selector Light-Pen, while not being used, can be placed in a recess of the keyboard, which is used for user's incidental items. Selector Pen (and Cursor Select) operations have been expanded to include a new designator character '&'. When this designator is used the Read Modified operation returns both the addresses and the data of all modified fields on the screen. The #6351 Selector Light Pen has a slightly wider field of view to facilitate operator ease-of-use. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:		MLC		Purchase	MMMC
		MRC	2 yr		
Audible Alarm	#1090	\$ 2	\$ 2	\$ 90	N/C
APL/Text	1120	9	8	360	.50
Switch Control Unit	1720	5	4	180	N/C
Extended Char Set Adptr	3610	11	9	405	2.50
Keyboard					
75 Key EBCDIC Typewrtr	4621	13	11	495	\$ 2.50
75 Key EBCDIC Data Enty	4622	13	11	495	3.50
75 Key EBCDIC Data Entry					
(Keypunch Layout)	4623	13	11	495	3.50
75 Key ASCII Typewriter	4624	13	11	495	2.50
87 Key EBCDIC					
Typewriter/APL	4626	18	15	675	3.50
87 Key EBCDIC Typewrtr	4627	18	15	675	3.00
87 Key ASCII Typewriter	4628	18	15	675	3.00
87 Key EBCDIC					
Typewriter/Text	4629	18	15	675	3.50
Keyboard Numeric Lock	4690	N/C	N/C	N/C	N/C
Magnetic Reader Control	4999	11	9	405	4.50
Security Keylock	6340	35	SUC -	35	N/C
Selector Light-Pen	6350	15	13	585	.50
Selector Light Pen	6351	15	13	585	.50

3278 Display Station (cont'd)

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the Feature Number as shown below at the price listed in the M10000 pages. See M10000 pages for additional information and for ordering for field installation.

Item	Feature Number	Maximum Quantity
Magnetic Hand Scanner	#9440	*
Magnetic Slot Reader	#9441	*
Magnetic Reader Extension Cable ... for use with Magnetic Hand Scanner or Magnetic Slot Reader		
19.7 ft. (6 meter)	#9106	**
39.4 ft. (12 meter)	#9107	**

* A maximum of one magnetic reader or scanner may be ordered.

** A maximum of one extension cable may be ordered.

MAGNETIC HAND SCANNER (#9440/Part No. 4123495): The Magnetic Hand Scanner (MHS) attaches by a 1.5 meter (4.9 ft) coiled cable to a number of data entry and reporting devices that have an appropriate magnetic adapter feature. It allows the user to read magnetic stripe labels that are attached to shelves, cartons, machines, etc. It can also be used to read magnetic stripe tags which are hand-held or placed on a flat surface.

The MHS has three lights and an audible buzzer which provide feedback to the user on the status of the scanned data. It can read a stripe in either direction. **Field Installation:** Yes. **Prerequisite:** Magnetic Reader Control (#4999). See Note 1.

MAGNETIC SLOT READER (#9441/Part No. 4123500): The Magnetic Slot Reader (MSR) attaches by a 1.5 meter (4.9 ft) cable to a number of data entry and reporting devices that have an appropriate magnetic adapter feature. The slot reader accommodates a wide range (height and length) of magnetic striped card stock and plastic badges including: job tickets, magnetic striped 80 column cards, operator identification badges, large and small credit cards, etc.

The MSR has three lights and an audible buzzer which provide feedback to the user on the status of scanned data. Holes in the bottom of the MSR allow optional attachment to an appropriate flat surface. **Field Installation:** Yes. **Prerequisite:** Magnetic Reader Control (#4999). See Note 1.

NOTE 1

The following cable assemblies can be used to extend the Magnetic Hand Scanner and Magnetic Slot Reader distances. **Limitations:** Extension cables cannot be plugged into other extension cables.

Description	Part Number
19.7 ft. (6 meter)	#9106/Part No. 4832986
39.4 ft. (12 meter)	#9107/Part No. 4832987

Both the MHS and the MSR read magnetically encoded information from a 10/63 alphanumeric character set; the MSR also reads the same 10 character numeric only set as the 3277 Operator Identification Card Reader (#4600) which is not a subset of the 10/63 alphanumeric character set. For a further description of both character sets see IBM 3270 Information Display System Character Set Reference GA27-2837. Either (not both) the 10/63 alphanumeric or the 10 numeric only 3277 like character set may be selected for the 3274 Control Unit at customization time. The 3276 Control Unit Display Station and attached 3278s support only the MSR and the 10 character numeric only set as used by the 3277.

Numeric and Alphanumeric Character Set Capacities are as follows:

MSR/MHS	Minimum Number of Hex Codes Between Start Sentinel and End Sentinel Characters	Maximum Number of Characters Between Start Sentinel and End Sentinel Characters	Bit Density	
			Bits per Inch	Bits per mm
3277 Like 10-Numeric Character Set	7	37	75	3
	7	100	127	5
Alphanumeric Character Set*	7	37 numerics	75	3
	7	18 non-numerics	75	3
	7	100 numerics	127	5
	7	50 non-numerics	127	5
	7	37 numerics	**210	8.3

* 1 Hex code = 1 numeric character,
2 Hex codes = 1 non-numeric character

** MSR only.

NOTE: Full width encoding is recommended for the MSR and is required for the MHS.

Maximums shown are ALL numeric or ALL non-numeric characters. If a combination of numeric and non-numeric characters is recorded, the total number of hex CODES must not exceed the numeric character maximum. For example: At 127 bpi, a combination of 60 numeric and 20 non-numeric characters is permissible.

Limitation: 3277-like 10 character set numerics only magnetic cards coded with Alternate End of Message character (hexadecimal "C") cannot be read by the MSR or MHS. The 10/63 character set and the MHR are only supported on 3278s which are attached to 3274 Control Units. IBM Host Programming Support is provided for 10/63 character set non-protected, display data entry. Protected, non-display data entry is supported by IMS and TSO. With this protected, non-display data entry support, all cards and documents which can be read by the 3630 Plant Data Communications System, up to 100 data characters, can be read by the 3270 System.

A variety of magnetic documents, tags, and labels which the MSR and MHS can read, some of which, depending on length, can be encoded by devices such as the 3642 Encoder Printer.



IBM 3278 DISPLAY CONSOLE Model 2A

Purpose: A cathode-ray tube (CRT) display console which attaches to 4331 and 4341 Processors and provides for operator interaction for both normal operations and maintenance. An operator console keyboard with an operator control panel available on the primary 3278 mdl 2A is the means to Power On (4341 only), Power Off, Initial Microcode Load (IML), and Start or Stop processor operations. See feature #4631 or #4632 for the 4341, or #4634 for the 4331 in "Special Features" below.

Highlights: Displays characters in a 7 x 14 matrix (uppercase alphabet is displayed in a 7 x 9 matrix), arranged in 24 rows of 80 characters each. Rows 1 through 20 are usable by the operator, rows 21 through 24 are used for system status information. A 96-character set is used, consisting of 26 upper case alphabetic, 26 lower case alphabetic, 10 numeric and 32 special characters, plus space and null.

In addition to Power On (4341 only), Power Off, IML and Start/Stop, the console allows the operator to manually control such functions as storage display and operation, address comparing, and normal versus instruction step processing. The console indicates to the operator both proper operations and malfunctions, should they occur.

For maintenance and service support the console can display and store the status of the processor complex and other valuable servicing information. It also provides a means for using diagnostic tools.

The 3278 model 2A that is used as the primary console is normally installed concurrently with the installation of the 4331 or 4341 Processor.

Operator Factors: The 3278 has an anti-glare screen. Indicators are displayed in symbols and/or words outside of the data area. The keyboard, which is low in profile, provides a palm rest area and has separators to help prevent accidental striking of control keys.

Editing: Cursor move, tab, home, back tab, insert, delete, erase to end-of-field and erase all input keys are basic to the console keyboard. Alphameric, special symbol and cursor move keys have typamatic capability. Twelve (12) Program Function (PF) keys are basic.

Audible Alarm: An alarm is sounded under program control to alert the operator to a special condition. This alarm, during keyboard operation, is also sounded when a character is entered into the next-to-last position on the screen (except when attached to a 4331). The operator may adjust the volume of the tone.

Problem Determination Procedures: Significant function has been designed into this unit to provide high availability to the customer. This high availability has been achieved through use of problem determination and recovery procedures that are easily understood and used by the operator. The procedures are provided by the Problem Determination Guide Manual that will be stored under the keyboard palm rest.

Prerequisites: An available console position on a 4300 Processor ... see 4331 or 4341. 3278 mdl 2As require an Operator Console Keyboard. The 3278 mdl 2A used as the primary console on a 4300 Processor must be equipped with an Operator Console Keyboard with an operator control panel ... see "Special Features" below.

SPECIFY

- **Voltage** (120 V, AC, 1-phase, 3-wire, 60Hz): #9890 for locking plug, or #9891 for non-lock plug.
- **Power Cable:** If the standard 2.8 meter (9 foot) power cable is not desired, specify #9511 for 1.8 meter (6 foot) cable, #9512 for 3.7 meter (12 foot) cable, or #9513 for 4.5 meter (15 foot) cable.
- **System Attachment:** For record purposes only, specify #9606 for attachment to 4331, or #9607 for 4341.

Prices: Mdl	MRC	MLC 2 Yr	Purchase	MMMC
3278 2A	\$79	\$67	\$2,680	\$21.50

Plan Offering: Plan B Machine Group: D Per Call: 3
 Purchase Option: 55% Warranty: B Useful Life Category: 2
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 5%

Model Changes: Not recommended for field installation.

SPECIAL FEATURES

KEYBOARDS

Cabling: Cables from the Display Console to the Processor will be furnished by IBM for keyboards #4631, 4632 and 4634. The fixed cable length provided for these features is 25 feet (7.6 meters). The cables must be ordered via normal procedures. For keyboard #4633 the cables must be supplied by the customer as outlined for the 3278 model 2 in the IBM Information Display System Installation Manual - Physical Planning, GA27-2787. The maximum cable length for this feature is 4925 feet (1500 meters).

Limitations: Keyboards used on the 3278 mdl 2A are not interchangeable with keyboards used on 3278 mdls 1 thru 4, nor with keyboards used on 3277 mdls 1, 2. A maximum of one keyboard can be ordered for a 3278 mdl 2A.

75-KEY OPERATOR CONSOLE KEYBOARD WITH CHANNEL TO CHANNEL (#4631). [For use with 4341 only] Typewriter-like layout, movable, with 12 PF keys available on the top row through use of the "Alternate" shift key. Provides 49 data keys and 26 control keys, and contains an operator control panel with 4 control keys (Power Off, Lamp Test, Power On/IML, Channel to Channel) and 6 LED indicators (Basic Check, System, Wait, Power in Process, Power Complete, Channel to Channel Disabled). **Note:** Channel to Channel is required for a 4341 Processor equipped with a Channel-to-channel Adapter (#1850). **Maximum:** One. **Limitation:** Cannot be installed with #4632 or #4633. **Field Installation:** Available at time of manufacture only.

75 KEY OPERATOR CONSOLE KEYBOARD WITHOUT CHANNEL TO CHANNEL (#4632). [For use with 4341 only] Same as #4631 but the operator control panel does not have the Channel to Channel control key or the Channel to Channel Disabled Indicator. **Maximum:** One. **Limitation:** Cannot be installed with #4631 or #4633. **Field Installation:** Available at time of manufacture only.

75-KEY OPERATOR CONSOLE KEYBOARD (#4633). [For use with 4341 only] Same as #4631 but with no operator control panel. **Maximum:** One. **Limitation:** Cannot be installed with #4631 or #4632. **Field Installation:** Available at time of manufacture only.

75-KEY OPERATOR CONSOLE KEYBOARD WITHOUT CHANNEL TO CHANNEL OR POWER ON (#4634). [For use with 4331 only] Same as #4631 but the operator control panel does not have the Channel to Channel control key, or the Channel to Channel Disabled Indicator, or the Power On key. **Maximum:** One. **Field Installation:** Available at time of manufacture only.

SECURITY KEYLOCK (#6340). A lock and key which prevents modification or display of data in the display terminal when in the "Off" position. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MRC	MLC 2 Yr	Purchase	MMMC
75-Key Operator Console Keyboard (4341)	#4633	\$16	\$14	\$560 \$6.00
75-Key Operator Console Keyboard w Chan-to-Chan (4341)	4631	34	29	1,160 6.50
w/o Chan-to-Chan (4341)	4632	32	27	1,080 6.50
w/o Chan-to-Chan (4331)	4634	32	27	1,080 6.50
Security Keylock	6340	35SUC	-	35 N/C

ACCESSORIES: A Console Table (#1550) is available ... see "Accessories" under 4331 or 4341 for ordering instructions and price.

**IBM 3284 PRINTER****Purpose:** Provides hardcopy output at a speed of 40 cps.**NOTE:** For possible use with System/3, see GSD Manual.

Model 1 Provides storage of 480 characters and attaches to a 3271 Control Unit mdl 1, 2, 11 or 12, or a 3272 Control Unit mdl 1 or 2, or a 3274 Control Unit mdl 1A, 1B, 1C or 1D, or a 8101 on a 8100 System. For use with 3790 or 8100, see below.

Model 2 Provides storage of 1,920 characters and attaches to either a 3271 Control Unit mdl 2 or 12, or a 3272 Control Unit mdl 2, or a 3274 mdl 1A, 1B, 1C or 1D, or a 8101 on a 8100 System. For use with 3790 or 8100, see below.

Model 3 Attaches to and uses the storage buffer of a 3275 Display Station mdl 2, 3 or 12.

Highlights: Provides a hardcopy output at a speed of 40 cps, using the EBCDIC character set ... for ASCII character sets, see "Specify" below. Model 1 and 2 may print from the Processor or the contents of a 3277 Display Station, 3284, 3286 or 3287 Printer buffer via the 3271, 3272 or 3274 Control Unit. When used with the 8100 System, the 3284 prints under control of the operating system. Model 3 prints the contents of the buffers of the 3275 Display Station or the 5275 Direct Numerical Control Station.

The unit has a pin feed platen which permits the feeding of marginally punched continuous forms paper. 120, 126 or 132 print positions may be specified ... see "Specify." Line spacing is 6 lines/inch. Matrix characters are formed by 7 vertical wires printing dots in up to 4 of 7 possible horizontal positions (see Note below). Use of the underscore in conjunction with another character will overprint the lowest dot in that character and is not recommended. Refer to SRL GA24-3488 for forms design considerations and limitations. Up to 6-part forms can be printed with a maximum thickness of .018" (for optimum feeding and stacking, no more than 3 parts are recommended). Forms lengths can be 3" to 14" in increments of 1/6". Card stock continuous forms are not recommended. **Note:** With special feature #1066 matrix characters are formed using 8 vertical wires.

For use with 3790 Communication System: A 3271 or 3272 is not required when the 3284 is attached to the 3791. For additional information see the 3791 Configurator GA27-2768-6. For power, see Specify [1] below; for cable, see M10000 for 3790. Host programs written for the IBM 3270 are not supported by the 3790 System.

For use with the 8100 Information System: For special features that are not supported, see M 8101 pages. A 3271 or 3272 is not required when the 3284 mdl 1 or 2 is attached to the 8101 with #1505 or #1506. For character set, specify #9809. For power, see Specify [1] below. For cables, see M10000 pages for 8100 System. Host programs written for the 3270 are not supported by the 8100 system.

PREREQUISITES: Model 1 -- a 3271 mdl 1, 2, 11 or 12, or a 3272 mdl 1 or mdl 2, or a 3274 mdl 1A, 1B, 1C or 1D with appropriate Device/Terminal Adapter, or a 8101 with #1505 or #1506 (see 8101 pages).

Model 2 -- a 3271 mdl 2 or 12, or a 3272 mdl 2, or a 3274 mdl 1A, 1B, 1C or 1D with appropriate Device/Terminal Adapter, or a 8101 with #1505 or #1506 (see 8101 pages).

Model 3 -- a 3275 mdl 2, 3 or 12 with Printer Adapter (#5550) or a 5275 with Printer Adapter (#5555).

Supplies: A black ribbon, IBM Part No. 1136970 or equivalent, is required.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Pin Feed Platen: #9162 for 126 print positions (13-1/8" hole-to-hole), or #9167 for 120 print positions (12-1/2" hole-to-hole), or #9168 for 132 print positions (13-7/8" hole-to-hole). **NOTE:** Do not order #9167 or #9168 unless paper is available in your area.

[3] Character Set: Specify one of the following unless Data Analysis-APL Feature (#1066) is selected;

#9089 -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC typewriter keyboard. #9089 required if used with the 3275 mdl 3. **PREREQUISITE:** If used with the 3271 mdl 1 or 2, EBCDIC Transmission Code (#9761) is required on the 3271 mdl 1 or 2.

#9091 -- for ASCII Character Set (A) (available at time of manufacture only) ... provides the 64 ASCII characters but sub-

stitutes the Logical OR (!) and Logical NOT (-) in place of the exclamation mark(!) and circumflex (^). **PREREQUISITE:** If used with the 3271, ASCII Transmission Code (#9762 or #1200) is required on the 3271.

#9092 -- for ASCII Character Set (B) (available at time of manufacture only) ... provides the standard 64 ASCII characters. **PREREQUISITE:** If used with the 3271, ASCII Transmission Code (#9762 or #1200) is required on the 3271.

[4] Cables: See M 10000 pages for 3284-1, -2 cable prices and ordering instructions. For cable specifications, see 3270 Installation Manual - Physical Planning, GA27-2787.

PRICES:	Mdl	MAC/ MRC	MLC 2 yr	Purchase	MMMC
3284	1	\$141	\$120	\$4,255	\$45.00
	2	150	128	4,775	45.00
	3	122	104	4,070	24.00

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 60% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Model changes between model 1 and model 2 are field installable. Model 3 is field installable on the 3275 or 5275 but is not interchangeable with a model 1 or model 2.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

3284 model 1 to model 2 \$694

SPECIAL FEATURES

DATA ANALYSIS-APL FEATURE (#1066). [Mdl 2 only with 3271 or 3272] Provides dual case EBCDIC, the APL set, and TN print train (see Type Catalog, S/370 Printers) characters. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	MLC 2 yr	Purchase	MMMC
Data Analysis-APL Fea #1066	\$ 42	\$ 36	\$1,385	\$2.00

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND (#4450) -- Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

IBM 3286 PRINTER

Purpose: Provides hard copy output at a speed of 66 cps.

NOTE: For possible use with S/3, see GSD manual.

Model 1 Provides storage of 480 characters and attaches to either a 3271 Control Unit mdl 1, 2, 11 or 12, or a 3272 Control Unit mdl 1 or 2, or a 3274 mdl 1A, 1B, 1C or 1D, or a 8101 on a 8100 System. For use with 3790 or 8100, see below.

Model 2 Provides storage of 1,920 characters and attaches to either a 3271 Control Unit mdl 2 or 12, a 3272 Control Unit mdl 2, a 3274 Control Unit mdl 1A, 1B, 1C or 1D, a 8101 on a 8100 System, or S/370 mdls 138 and 148 as a hard copy console printer via their standard Integrated Console Printer Adapter. For use with 3790 or 8100, see below.

Model 3 Attaches to and uses the storage buffer of a 3735 Programmable Buffered Terminal mdl 1.

Highlights: Provides controls, storage and hard copy output at a speed of 66 cps, using the EBCDIC character set ... for ASCII character sets, see "Specify" below. The unit may print from a Processor or the contents of a 3277 Display Station, 3284, 3286 or 3287 Printer buffer via the 3271, 3272 or 3274 Control Unit. When attached to a 3735, the 3286 mdl 3 prints under 3735 Program Control. When attached to a S/370 mdl 138 or 148 via the standard Integrated Console Printer Adapter the 3286 mdl 2 prints under system control program control as supported by that system control program (see 3138 or 3148 "Machines" pages for details). When attached to a 8100 Information System, the 3286 prints under control of the operating system.

The unit has a pin feed platen which permits the feeding of marginally punched continuous forms paper. 120, 126 or 132 print positions may be specified ... see "Specify." Line spacing is 6 lines/inch. Matrix characters are formed by 7 vertical wires printing dots in up to 4 of 7 possible horizontal positions (see Note below). Use of the underscore in conjunction with another character will overprint the lowest dot in that character and is not recommended. Refer to SRL GA24-3488 for forms design considerations and limitations. Up to 6-part forms can be printed with a maximum thickness of .018" (for optimum feeding and stacking, no more than 3 parts are recommended). Forms lengths can be 3" to 14" in increments of 1/6". Card stock continuous forms are not recommended. **Note:** With Data Analysis-APL Feature (#1066) matrix characters are formed using 8 vertical wires.

For use with 3790 Communication System: A 3271 or 3272 is not required when the 3286 is attached to the 3791. For additional information see the 3791 Configurator, GA27-2768-6. For power, see Specify [1] below; for cable, see M10000 for 3790. Host programs written for the IBM 3270 are not supported by the 3790 System.

For use with the 8100 Information System: For special features that are not supported see 8101 machine pages. A 3271 or 3272 is not required when the 3286 mdl 1 or 2 is attached to the 8101 with #1505 or #1506. For character set, specify #9089. For power, see Specify [1] below. For cables, see M10000 pages for the 8100 System. Host programs written for the 3270 are not supported by the 8100 System.

PREREQUISITES:

Model 1 -- a 3271 mdl 1, 2, 11 or 12, or a 3272 mdl 1 or 2, or a 3274 mdl 1A, 1B, 1C or 1D with appropriate Device/Terminal Adapter, or a 8101 with #1505 or #1506. See 8101 pages.

Model 2 -- a 3271 mdl 2 or 12, a 3272 mdl 2, or a 3274 mdl 1A, 1B, 1C or 1D with appropriate Device/Terminal Adapter, or a S/370 mdl 138 or 148. Also attaches to a 8101 with #1505 or #1506. See 8101 pages.

Model 3 -- a 3735 mdl 1 with #7880 installed.

Supplies: A black ribbon, IBM Part No. 1136970 or equivalent, is required.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Pin Feed Platen: #9162 for 126 print positions (13-1/8" hole-to-hole), or #9167 for 120 print positions (12-1/2" hole-to-hole), or #9168 for 132 print positions (13-7/8" hole-to-hole). **NOTE:** Do not order #9167 or #9168 unless paper is available in your area, or if attaching the 3286 mdl 2 to a S/370 mdl 138 or 148 via their Integrated Console Printer Adapter.

[3] Character Set: Specify one of the following unless attaching to a S/370 mdl 138 or 148 via their standard Integrated Console

Printer Adapter or unless Data Analysis-APL Feature (#1066) is selected.

#9089 -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC typewriter keyboard. **PREREQUISITE:** If used with the 3271 mdl 1 or 2, EBCDIC Transmission Code (#9761) is required on the 3271 mdl 1 or 2.

#9091 -- for ASCII Character Set (A) (available at time of manufacture only) ... provides the 64 ASCII characters but substitutes the Logical OR (!) and Logical NOT (-) in place of the exclamation mark (!) and circumflex (^). **PREREQUISITE:** If used with the 3271, ASCII Transmission Code (#9762 or #1200) is required on the 3271.

#9092 -- for ASCII Character Set (B) (available at time of manufacture only) ... provides the standard 64 ASCII characters. **PREREQUISITES:** If used with the 3271, ASCII Transmission Code (#9762 or #1200) is required on the 3271. If used with the 3735, ASCII Transmission Code (#9762) is required on the 3735.

[4] Character Set when attaching to a S/370 mdl 138 or 148 via the standard Integrated Console Printer Adapter:

#9089 only -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC typewriter keyboard.

[5] Cables unless attaching to the S/370 mdl 138 or 148 via the standard Console Printer Adapter: See M 10000 pages for 3286 cable prices and ordering instructions. For cable specifications, see 3270 *Installation Manual - Physical Planning*, GA27-2787.

[6] Cables when attaching to the S/370 mdl 138 or 148 via the standard Integrated Console Printer Adapter: Cable order required. For ordering instructions see *Installation Manual - Physical Planning*, GA22-7004.

PRICES:	Mdl	MAC/ MRC	MLC 2 yr	Purchase	MMMC
3286	1	\$169	\$144	\$5,690	\$47.00
	2	179	152	6,305	47.00
	3	155	132	5,475	45.50

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 60% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Model changes between model 1 and model 2 are field installable ... model 3 is not interchangeable with model 1 or model 2.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

3286 model 1 to model 2 \$736

SPECIAL FEATURES

DATA ANALYSIS-APL FEATURE (#1066). [Mdl 2 only and attached to 3271 or 3272] Provides dual case EBCDIC, the APL set, and TN print train (see Type Catalog, S/370 Printers) characters. **Field Installation:** Yes. **Note:** Not available when attaching the mdl 2 to a S/370 mdl 138 or 148 via the standard Integrated Console Printer Adapter.

Special Feature Prices:	MAC/ MRC	MLC 2 yr	Purchase	MMMC
Data Analysis-APL Fea	#1066 \$ 42	\$ 36	\$1,385	\$2.00

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND (#4450) -- Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

* Corrects Termination Charge Percent.

IBM 3287 PRINTER Models 1 and 2

Purpose: Provides hard copy output. The 3287 mdl 1 and 2 attach to a 3271 Control Unit mdl 1, 2, 11 or 12, a 3272 Control Unit mdl 1 or 2, a 3274 Control Unit mdl 1A, 1B, 1C or 1D, a 3276 Control Unit Display Station mdl 1, 2, 3, 4, 11, 12, 13 or 14, a 3791 Controller, or to the 8101 Storage and Input/Output Unit of the 8100 Information System. The 3287 mdl 1 or 2 also attaches, via the Integrated Console Printer Adapter, to a S/370 mdl 138 or 148 as a console printer. The 3271 mdl 1 or 2 also attaches to the 4331 Processor via the Display/Printer Adapter, or directly to a 4341 Processor.

Model 1 80 cps maximum bi-directional printer.

Model 2 120 cps maximum bi-directional printer.

NOTE: Actual printer throughput is dependent upon operational and system characteristics. Factors such as controller configuration and line transmission speed, output format, and programming application processing must all be considered in determining actual throughput.

Highlights: The 3287 consists of control functions, printer and indicator lights in one integrally designed desk-top unit. Special features are available which permit tailoring of the printer to the user's requirements.

Where the 3287 replaces a 3284 or 3286 Printer the Variable Width Forms Tractor (special feature) is used in lieu of the Pin Feed Platen or Forms Tractor RPQ. In addition, Friction Feed Paper Handling is available as a special feature.

Control Functions: Provides the control for all online operations. This unit requires the 3271/3272 Attachment (#8330) for receiving data from a 3271/3272 Control Unit, a 3274 Control Unit (Terminal Adapter Type B), a 3790 Communication System, through the 8101 Storage and Input/Output Unit of the 8100 System, a S/370 mdl 138/148 (Integrated Console Printer Adapter), or the 3274/3276 Attachment Feature (#8331) for receiving data from a 3274 Control Unit (Terminal Adapter Type A) or a 3276 Control Unit Display Station, a 4331 Processor Display/Printer Adapter or a 4341 Processor.

Printer: Maximum printer throughput is obtained with bi-directional serial matrix printing and indexing without unnecessary print head movement. The printer dot matrix is 4 of 7 wide by 8 high giving high legibility with character spacing at 10 to the inch. Line spacing is 6 and 8 lines to the inch. Up to 132 characters can be printed in a line. Up to 6 part forms (total thickness -- 0.457mm/0.018") may be used. For any multi-part or pre-printed continuous forms the Variable Width Forms Tractor (#8700) is recommended. Five and six part continuous forms should be tried on an individual basis for acceptable feeding, registration, and print quality.

Friction Feed Paper Handling (#4110) is recommended for use with non-preprinted single part roll or fan-fold paper, with a minimum width of 203mm/8", when the Variable Width Forms Tractor (#8700) is not used. Maximum overall forms width is 378mm/14-7/8"; card stock forms are not recommended. See GA24-3488 for form specifications and limitations.

Audible Alarm, Mono/Dual case, Single/Double line spacing, and Maximum Print Position are standard functions. Audible Alarm (activated under program control) and Dual Case are not supported by S/370 mdl 138/148 as a Console Printer, or when attached to any 4300 Processor. Dual Case is not supported for ASCII-B when using 3271/3272 Attachment (#8330). Mono/Dual switch is inoperative when the 3287 is operating in SCS (SNA Character String) data stream mode or when copying from a display or when operating in APL mode.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that can be understood and used by the operator. See Customer Responsibilities below.

Customer Set-Up (CSU): The 3287 is designated as Customer Set-Up thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at the customer's receiving dock, unpacking, and placement of the 3287.
- Physical set-up, connection of cables, switch settings, and checkout.
- Contact Field Engineering to make cable connections of IBM CSU units to IBM non CSU units where customer access areas are not provided.
- Notify IBM of intent to relocate and follow IBM instructions for relocation.

- Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.
- Disconnecting, packing and removal to the customer shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.
- Providing a desk or table top to support the 3287.

PREREQUISITES:

Attachment	Attachment Fea. on 3287	Device Adapter on Control Unit
3271/3272	#8330	Available port or added #3250
3274	#8330/8331	Type A or B Adapter (see M 3274 pages)
3276	#8331	Available port or added #3255, #3256, #3257
3791	#8330	Available port or #7911 or #7912 or added #7912.
S/370 mdl 138/148	#8330	#9425
8101	#8330	Available port on #1505 or #1506

Forms Handling; Variable Width Forms Tractor (#8700) or Friction Feed Paper Handling (#4110) must be ordered for each 3287 mdl 1 or 2.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Supplies: A black ribbon, IBM Part No. 1136653 or equivalent, is required.

Specify Features (For details, see Specify descriptions):

		(AA)	(BB)	(CC)	(DD)	(EE)	(FF)	(GG)
		(d)						
- Locking Plug	#9890	X	X	X	X	X	X	X
- Non-lock Plug	9891	X	X	X	X	X	X	X
- Power Cord								
1.8m (6 foot)	9511	X	X	X	X	X	X	X
2.8m (9 foot)	default	X	X	X	X	X	X	X
3.7m (12 foot)	9512	X	X	X	X	X	X	X
4.5m (15 foot)	9513	X	X	X	X	X	X	X
- Cables ... see Specify below		X	X	X	X	X	X	X
- Character Set (Note a)								
EBCDIC	9082	X	X	X	X	X	X	X
ASCII (B) (Note b)	9084	X	X	X	X			
- Variable Width Forms								
Tractor-Paper Handlg	9185	X	X	X	X	X	X	X
- Page Length Cntrl (a)	9550	X	X	X	X			
- SCS Support	9660	X	X					
- X Print Error Indication	9488	X	X	X	X	X	X	X
- Character Print Operation								
480 Characters	9520	X	X		X			X
960 Characters	9521	X	X					
1920 Characters	9522	X	X	X	X	X	X	X
2560 Characters	9523	X	X					
3440 Characters	9524	X	X					
3564 Char. (Note e)	9525	X						
- System Attach ... see Specify		X	X	X	X	X	X	X
- Blower	9030	X	X	X	X	X	X	X

(AA) = 3271/3272 Control Unit
 (BB) = 3274 Control Unit
 (CC) = 3276 Control Unit Display Station
 (DD) = 3791 Control Unit
 (EE) = S/370 mdl 138/148 (Note c)
 (FF) = 8100 System (8101 attach)
 (GG) = 4331, 4341 Processors

NOTES:

- (a) Do not specify if Data Analysis-APL Feature (#1066) is selected for attachment to the 3271 or 3272 Control Unit.
- (b) Cannot be installed with SCS Support (#9660) or APL/Text (#1120).
- (c) For use of the 3287 mdl 1 or 2 as a Console Printer.
- (d) For Terminal Adapter Type B on the 3274 Control Unit select from Specify Features #9520 and #9522 for Character Print Operations. For Terminal Adapter Type A Specify Feature #9520 is not required. Specify Features #9521, 9523, 9524, 9525 and 9660 cannot be selected for Terminal Adapter Type B.
- (e) Not applicable to 3274 mdl 1B.

SPECIFY: [1] Plug (120 V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug.

[2] Power Cord: If standard 2.8m (9 foot) power cord is not desired, specify #9511 for 1.8m (6 foot) power cord, #9512 for 3.7m (12 foot) power cord, or #9513 for 4.5m (15 foot) power cord.

3287 Printer Models 1 and 2 (cont'd)

[3] Cables: See M 10000 pages for 3287 mdls 1 and 2 cable prices and ordering instructions. See Installation Manual - Physical Planning, GA27-2787, for cable details. When attaching to the S/370 mdl 138/148 via the Integrated Console Printer Adapter, refer to Installation Manual-Physical Planning, GA22-7004, for cable ordering information.

[4] Character Set: Specify one of the following unless the Data Analysis-APL Feature (#1066) is selected. See "Special Features."

- #9082 ... for EBCDIC Character Set.
- #9084 ... for ASCII Character Set (B).

NOTES: The character set specified [EBCDIC or ASCII (B)] must be the same as the transmission code/character set used on the control unit to which it is attached ... ASCII (B) (#9084) is not supported as S/370 mdl 138/148 Console Printer, or when attached to any 4300 Processor. ... If used with the 3791, ASCII Support (#9022) is required on the 3791. Do not specify ASCII-(B) Character Set (#9084) when APL/Text (#1120) has been selected.

[5] Variable Width Forms Tractor - Paper Handling #9185: Specify if Variable Width Forms Tractor (#8700) is ordered and there is a requirement to handle forms with an overall width from 76.2 to 203.2mm (3 to 8 inches). PREREQUISITE: Variable Width Forms Tractor (#8700).

[6] Page Length Control #9550: Allows customer insertion of Forms Feed (FF) Character (HEX OC) into the data stream. Upon detection of the FF character, the printer will skip to the first print line of the next form. The form length is entered into two decade switches on the 3287 by the operator and is variable from 00 to 99. (The programming implementation of this feature is the customer's responsibility.) PREREQUISITE: Variable Width Forms Tractor (#8700). LIMITATIONS: Cannot be installed with Data Analysis-APL Feature (#1066) or SCS Support (#9660). NOTES: Not supported as S/370 mdl 138/148 Console Printer ... When SCS Support (#9660) has been selected (includes page length control), the user can perform the page length control function when not in SCS mode of operation.

[7] SCS Support #9660: Provides the capability to receive SCS (SNA Character String) data stream from the host via a 3274 Control Unit or a 3276 Control Unit Display Station. This feature allows the 3287 to perform such functions as:

- Vertical forms skipping to a header or to a vertical tab position
- Horizontal skipping to a horizontal tab stop position.

Page size, header location, vertical and horizontal tab positions are host-loaded through the 3274 or 3276 via application programming. Included in SCS Support (#9660) are Cancel and Program Attention 1/Program Attention 2 (PA1/PA2) switches. Cancel switch allows operator termination of the current print operation. PA1/PA2 switch allows an operator to request a specific action from the user written program in the host. MAXIMUM: One. FIELD INSTALLATION: Yes. LIMITATIONS: Cannot be installed with 3271/3272 Attachment (#8330), with 3274 mdl 1B or 1D, or ASCII Character Set (B) (#9084). PREREQUISITES: Variable Width Forms Tractor (#8700). 3276 mdls 11, 12, 13 or 14 or 1, 2, 3 or 4 with SDLC/BSC Switch (#6315) in SDLC mode or SNA/SDLC Support specified/configured on the 3274. Operator settings for page size, 6 or 8 LPI, and Maximum Print Position can be overridden by the host program when the 3287 has 3274/3276 Attachment (#8331) and SCS Support (#9660) and only when user is operating in SCS mode.

[8] X Print Error Indication #9488: To indicate an error an X is printed on the print line immediately below the last line normally printed. LIMITATION: Inactive when 3287 is attached to a 3274 or 3276 via feature #8331 and is operating in SCS mode.

[9] Character Print Operation:

For 3271/3272 Attachment specify one of the following:

#9520 - (480 character print operation) for use with a 3271 Control Unit mdl 1 or 11, a 3272 Control Unit mdl 1, a 3274 Control Unit mdl 1A, 1B, 1C or 1D, or a 3791 Controller, or to the 8101 of the 8100 System when attached via feature #8330. NOTE: #9520 (480 character print operation) can also be specified for use with a 3271 Control Unit mdl 2 or 12, or a 3272 Control Unit mdl 2.

#9522 - (1920 character print operation) for use with a 3271 Control Unit mdl 2 or 12, a 3272 Control Unit mdl 2, a 3274 Control Unit mdl 1A, 1B, 1C or 1D, a 3791 Controller, or to the 8101 of the 8100 System when attached via feature #8330, or a S/370 mdl 138/148 Integrated Console Printer Adapter.

For 3274/3276 Attachment specify one of the following:

To specify the printer buffer size when the printer is used in 3270 data stream mode.

#9521 - (960 character print operation) for use with a program which requires a printer buffer size of 960 bytes while using Erase/Write Alternate Command.

#9522 - (1920 character print operation) for use with a program which requires a printer buffer size of 1920 bytes while using Erase/Write Alternate Command.

#9523 - (2560 character print operation) for use with a program which requires a printer buffer size of 2560 bytes while using Erase/Write Alternate Command. PREREQUISITE: Extended Print Buffer (#3880).

#9524 - (3440 character print operation) for use with a program which requires a printer buffer size of 3440 bytes while using Erase/Write Alternate Command. PREREQUISITE: Extended Print Buffer (#3880).

#9525 (3564 character print operation) -- for use with a program which requires a printer buffer size of 3564 bytes while using Erase/Write Alternate command. Prerequisite: Extended Print Buffer (#3880). Limitation: This specify code only valid when 3287 is attached to a 3274 mdl 1A, 1C or 1D.

NOTE: To provide compatibility with current application programs on the 3270 Information Display System the customer can use an Erase/Write command for Specify #9521 to provide 480 character print operation and Specify #9522, #9523, #9524 and #9525 to provide 1920 character print operation. Allowable usage in SNA Character String of the full buffer varies according to the control unit (3274 or 3276) to which the printer is attached and to programming considerations. See IBM 3270 Information Display System Component Description, GA27-2749, for details. Copy operation from larger screen display to smaller printer buffer is not acceptable.

3287 PRINTER ATTACHMENT TABLE

— CHARACTER PRINT OPERATION —

3276 Mdl	480/960	1920/1920	1920/2560	1920/3440
1	Yes	No	No	No
11	Yes	Yes	Yes	Yes
2	Yes	Yes	No	No
12	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	No
13	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes
14	Yes	Yes	Yes	Yes

NOTE: 3276 mdls 1, 2 and 3 with the SDLC/BSC Switch feature installed and operating in SDLC mode will support all 3287 character print operations except 3564 Character Print Operation (#9525), (see previous Copy operation restriction).

[10] Blower (#9030): Must be specified for 3287 mdl 1 or 2 to be used in an environment above 32.3°C (90°F) ambient temperature [specification limits up to 40.5°C (104°F)]. Not recommended for field installation.

[11] System Attachment: Identify the attaching Control Unit or the natively attached Host Processor by specifying the following codes:

Control Unit/ Natively Attached Host Processor	Code		
3271	#9251	3276, 1-4	#9552
3272	#9252	3276, 11-14	#9553
3274-1A	#9549	3791	#9253
3274-1B	#9554	S/370 mdl 138	#9254
3274-1C	#9551	S/370 mdl 148	#9255
3274-1D	#9261	8101 (direct attach)	#9606
		4331	9262
		4341	9263

PRICES:	Mdl	MRC	MLC 2 yr	Purchase	MMMC
3287	1	\$167	\$142	\$5,680	\$ 47
	2	203	173	6,055	58

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 55% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Customer Set-Up Designated: Yes.

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From Model 1 to Model 2 \$ 375



3287 Printer Models 1 and 2 (cont'd)

SPECIAL FEATURES

(For details, see Special Feature descriptions.)

(AA) (BB) (CC) (DD) (EE) (FF)

Data Analysis-APL Feature (Note a)	#1066	X							
APL/Text (Note c)	1120		X						
ECSA (Note c)	3610		X						
Ext Print Buffer	3880		X	X					
Friction Fd Paper Hndlg	4110	X	X	X	X	X	X	X	
3271/3272 Attachment	8330	X	X		X	X	X	X	
3274/3276 Attachment	8331		X	X					
Var. Width Forms Tractor	8700	X	X	X	X	X	X	X	

- (AA) = 3271/3272 Control Unit
- (BB) = 3274 Control Unit
- (CC) = 3276 Control Unit Display Station
- (DD) = 3791 Control Unit
- (EE) = S/370 mdl 138/148 (Note b)
- (FF) = 8100 System (8101 attach)

NOTES:

- (a) Cannot install Page Length Control (#9550) or Character Set (#9082 or #9084) and Data Analysis-APL Feature (#1066) on the same machine.
- (b) For use of 3287 as a console printer.
- (c) Cannot be installed on a 3287 that will attach to a 3274 mdl 1B.

DATA ANALYSIS-APL FEATURE (#1066). Provides dual case EBCDIC, the APL set, and support of TN characters as defined in Type Catalog, S/370 Printers, under "TN Text Printing."
Maximum: One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitations:** Cannot be installed with Page Length Control (#9550), Character Set #9082 or #9084, 3271/3272 Attachment (#8330) to a 3274, or 3274/3276 Attachment (#8331). **Prerequisites:** 1920 Character Print Operation (#9522) on 3287 ... Data Analysis-APL Feature (#1066) on 3271 mdl 2 or 12, or 3272 mdl 2. **Note:** Not supported as a S/370 mdl 138/148 console printer or for the 3791 or the 8100 System when attached by feature #8330, or when attached to any 4300 Processor.

APL/TEXT (#1120). Provides the capability for printing the 222-character APL/Text character set including the 94-character EBCDIC character set. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitations:** Cannot be installed with 3271/3272 Attachment (#8330), or on a 3287 Printer which is to attach to a 3276 without APL/Text Control feature (#1067) or 3274 mdl 1B control unit, or to a 3274 Control Unit customized without the APL/Text Control Function, or when attached to any 4300 Processor. ASCII-(B) Character Set (#9084) cannot be specified with this feature. **Prerequisites:** Extended Character Set Adapter (#3610) and EBCDIC Character Set (#9082).

EXTENDED CHARACTER SET ADAPTER (#3610). Provides the additional control and buffering necessary to access the extended character set in APL/Text (#1120) feature. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitation:** Cannot be installed with 3271/3272 Attachment (#8330). **Corequisite:** APL/Text (#1120).

EXTENDED PRINT BUFFER (#3880). Provides additional buffer storage which allows 2560, 3440 or 3564 character print operation on the 3287. See SRL GA27-2749 for details. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitations:** Cannot be installed with 3271/3272 Attachment (#8330). Allowable usage in SNA Character String of the full buffer varies according to the control unit (3274 or 3276) to which the printer is attached and to programming considerations. See IBM 3270 Information Display System Component Description, GA 27-2749,, for details.

FRICION FEED PAPER HANDLING (#4110). For friction feeding of single part non-preprinted continuous and fan fold paper with a minimum width of 203mm (8 inches). Included in this feature is a paper tear bar for tearing continuous forms approximately 64mm (2-1/2 inches) above the printline. Feature #4110 is used interchangeably with the Variable Width Forms Tractor and is attached and removed by the customer. **Maximum:** One. **Field Installation:** Yes. **Customer Set-up:** Yes.

3271/3272 ATTACHMENT (#8330). Provides one interface for attachment of a 3287 mdl 1 or 2 to a 3271 Control Unit mdl 1, 2, 11 or 12, a 3272 Control Unit mdl 1 or 2, a 3274 Control Unit mdl 1A, 1B, 1C or 1D, a 3791 Controller, an 8101 Storage and Input/Output Unit, or a 3287 mdl 1 or 2 to a S/370 mdl 138 or 148 Integrated Console Printer Adapter. It provides the buffer storage required for print operation. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitations:** Cannot be installed with Extended Character Set Adapter (#3610), or with 3274/3276 Attachment (#8331) or Data Analysis-APL Feature

(#1066) to a 3274. **Prerequisites:** For 3271/3272 Control Unit -- available port or added feature #3250 on a 3271 mdl 1, 2, 11 or 12, or 3272 mdl 1 or 2 ... see M 3271 or M 3272 pages. For 3274 Control Unit -- an available Type B port or added Type B Adapter ... see M 3274 pages. For 3791 Controller ... Device Attachment Type II (#7911/7912) ... see M 3791 pages. For 8101 Storage and Input/Output Unit ... Display and Printer Adapter (#1505) or Display and Printer Additional (#1506) ... see 8100 Information System. For S/370 mdl 138 or 148 -- an Integrated Console Printer Adapter (#9425) ... see M 3138, M 3148 pages.

3274/3276 ATTACHMENT (#8331). Provides one interface for attachment of a 3287 mdl 1 or 2 to a 3274 Control Unit mdl 1A, 1B, 1C or 1D, or to a 3276 Control Unit Display Station mdl 1, 2, 3, 4, 11, 12, 13 or 14, or to any 4300 Processor. Provides buffer storage required for print operation. Included in this feature is Buffer Reprint support. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitations:** Cannot be installed with 3271/3272 Attachment (#8330) or Data Analysis - APL Feature (#1066). **Prerequisites:** An available port or added feature #3255, #3256, #3257 on a 3276, or an available Type A port or added Type A Adapter on a 3274, or an available port on the 4331 Processor Display/Printer Adapter, or an available console position on a 4341 Processor.

VARIABLE WIDTH FORMS TRACTOR (#8700). A forms feeding device for continuous margin punched forms. Overall forms width from 76.2mm to 381.0mm (3 to 15 inches) can be fed. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** Yes. **Prerequisites:** Variable Width Forms Tractor-Covers (#9850) and Variable Width Forms Tractor - Paper Handling (#9185) where there is a requirement to handle forms with an overall width from 76.2 to 203.2 mm (3 to 8 inches).

Special Feature Prices:	MRC	MLC		Purchase	MMMC
		2 yr			
Data Analysis-APL Fea #1066	\$ 11	\$ 9	\$ 315	N/C	
APL/Text	1120	6	5	175	\$.50
Ext Char Set Adapter	3610	15	13	455	4.00
Extended Print Buffer	3880	7	6	210	.50
Friction Fd Paper Hndlg	4110	6	5	160	.50
3271/3272 Attachment	8330	31	26	910	3.50
3274/3276 Attachment	8331	6	5	175	.50
Var Width Forms Tractor	8700	6	5	160	.50

Accessory Feature: Available on a purchase only basis. For shipment with machine, order number indicated below at the purchase price indicated on the M 10000 pages. See M 10000 pages for additional information and field installation.

FORMS STAND (#4450). Permits placement of continuous forms on stand above floor level and provides for stacking after printing.



IBM 3287 PRINTER Models 11 and 12

Purpose: Provides hard copy output for the 8100 Information System via Loop attachment.

Model 11 80 cps maximum bi-directional printer.

Model 12 120 cps maximum bi-directional printer.

Note: Actual printer throughput is dependent upon operational and system characteristics. Factors such as controller configuration, line transmission speed, output format, and programming application processing must all be considered in determining actual throughput.

Highlights: The 3287 mdl's 11 and 12 consist of Loop communication functions, printer and indicator lights in one integrally designed desk-top unit. EBCDIC Dual Case Operation, Audible Alarm, and Cancel Print are provided as standard functions. Variable Width Forms Tractor and Friction Feed Paper Handling are available as special features.

The printer operates in SCS mode, which provides for customer program defineable horizontal and vertical formatting, including line density (6 or 8 lines per inch). Operator capability to set the page length, page width, and the line density from the operator panel is available via RPQ.

Printer: Maximum printer throughput is obtained with bi-directional serial matrix printing and indexing without unnecessary print head movement. The printer dot matrix is 4 of 7 wide by 8 high giving high legibility with character spacing at 10 characters per inch. Line spacing is 6 and 8 lines to the inch. Up to 132 characters can be printed on a line. Up to 6 part forms with total thickness of .457mm (0.018 inches) may be used. For any multi-part or pre-printed continuous forms, the Variable Width Forms Tractor (#8700) is recommended. Five and six part continuous forms should be tested on an individual basis for acceptable feeding, registration and print quality. Maximum overall forms width is 381mm (15 inches); card stock forms are not recommended. (See GA24-3488 for form specifications and limitations.)

The Friction Feed Paper Handling (#4110) is recommended for use with non-preprinted single part roll or fan-fold paper, with a minimum width of 203mm (8 inches), when the Variable Width Forms Tractor (#8700) is not used. Maximum overall forms width is 378mm (14-7/8 inches); card stock forms are not recommended. (See GA24-3488 for form specifications and limitations.)

Problem Determination Procedure: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that can be understood and used by the operator. See *Customer Responsibilities* below.

Customer Set-up (CSU): The 3287 is designated as Customer Set-up thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at the customer's receiving dock, unpacking and placement of the 3287.
- Physical set-up connection of cables, switch settings and checkout.
- Notify IBM of intent to relocate and follow IBM instructions for relocation.
- Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.
- Disconnecting, packing and removals to the customer shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.
- Providing a desk or table top to support the 3287.

Prerequisites: For direct attached Loop operation - #4830 or #4835 on the 8100 System. For data link attached Loop operation - a 3842 Loop Control Unit.

Bibliography: See KWIC Index, GA20-1621, or specific system bibliography.

Supplies: A black ribbon, IBM Part No. 1136653 or equivalent, is required.

Specify: [1] Plugs (120 V AC, 1-phase, 3-wire, 60Hz): #9890 for locking plug or #9891 for non-locking plug.

[2] Power Cord: If standard 2.8 meter (9 foot) power cord is not desired, specify #9511 for 1.8 meter (6 foot) power cord, #9512 for 3.7 meter (12 foot), or #9513 for 4.5 meter (15 foot) power cord.

[3] Carrier Rate: One of the following must be specified: -- #9825 for up to 9600 bps or #9829 for 38,400 bps.

[4] Variable Width Forms Tractor Paper Handling: Specify #9185 if there is a requirement to handle forms with an overall width from 76.2 to 203.2mm (3 to 8 inches).

[5] Blower: #9030 must be specified for 3287 mdl 11 or 12 to be used in an environment above 32.3°C (90°F) ambient temperature [specification limits up to 40.5°C (104°F)]. **Field installation:** Not recommended.

[6] Direct Attach or Data Link Attach: Identify direct attached or data link attached by specifying one of the following:

- #9607 - Direct Attached Loop Operation
- #9608 - Data Link Attached Loop Operation

PRICES	Mdl	MRC	MLC 2 yr	Purchase	MMMC
3287	11	\$196	\$167	\$5,875	\$51.50
	12	233	198	6,250	62.50

Rental Plan: Plan B Warranty: B Machine Group: A
 Purchase Option: 55% Useful Life Category: 2 Per Call: 1
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 5% Customer Set-up: Yes

Model Changes: Can be made in the field.

Model Upgrade Purchase Price (there are no additional installation charges)

From Model 11 to Model 12 \$375

Note: Model changes from models 1 and 2 to models 11 and 12 are not recommended for field installation.

SPECIAL FEATURES

One of the following two features must be ordered, or both features may be ordered.

FRICITION FEED PAPER HANDLING (#4110). For friction feeding of a single part non-preprinted continuous and fan fold paper with a minimum width of 203mm (8 inches). Included in this feature is a paper tear bar for tearing continuous forms approximately 64mm (2-1/2 inches) above the print line. #4110 is used interchangeably with the Variable Width Forms Tractor and is attached and removed by the customer. **Maximum:** One. **Field installation:** Yes. **Customer Set-up:** Yes.

VARIABLE WIDTH FORMS TRACTOR (#8700). A forms feeding device for continuous margin punched forms. Overall forms width from 76.2 to 381.0mm (3 to 15 inches) can be fed. **Maximum:** One. **Field installation:** Yes. **Customer Set-up:** Yes. **Prerequisite:** Variable Width Forms Tractor Paper Handling (#9185) where there is a requirement to handle forms with an overall width from 76.2 to 203.2mm (3 to 8 inches).

Note: For applications that require forms skipping the Variable Width Forms Tractor (#8700) is recommended.

Special feature Prices:	MRC	MLC 2 yr	Purchase	MMMC	
Friction Fd Paper Hndlg #4110	\$ 6	\$ 5	\$ 160	\$.50	
Variable Width Forms Tractor	8700	6	5	160	.50

Accessory Feature: Available on a purchase only basis. For shipment with machine, order number indicated below at the purchase price indicated in the M10000 pages. See M10000 pages for additional information and field installation.

FORMS STAND (#4450). Permits placement of continuous forms on stand above floor level and provides for stacking after printing.



DP Machines
IBM 3288 LINE PRINTER

M 3288
 Jul 79

Purpose: Provides hard copy output at speeds up to 120 LPM.

NOTE: For possible use with S/3, see GSD manual.

Highlights: Printing is from characters engraved on a revolving print belt. Included as standard is one interchangeable print belt. Provides hard copy output at a speed of up to 120 LPM (64 character set, EBCDIC or ASCII) or up to 80 LPM (120 character set, EBCDIC only) ... see character set in "Specify" below. May print from the CPU or the contents of a 3277 Display Station via the 3271 mdl 2 or 12, 3272 mdl 2, or 3274 mdl 1A, 1B, 1C or 1D. When attached to a 8101 of a 8100 System the 3288 prints under control of the operating system.

Prints 10 characters per inch, 132 characters or positions per line at 6 lines per inch on continuous fan-fold paper. The paper handling mechanism is adjustable to accept paper from widths of 3.5" (8.9cm) to 15.0" (38.10cm). Paper up to 6 parts plus carbon (maximum total thickness is .020" or .50mm) can be accommodated. Use of card stock forms is not recommended (refer to Forms Design Reference Guide for Printers, GA24-3488). Forms jam detection is provided.

For use with 3790 Communication System: A 3271 or 3272 is not required when the 3288 is attached to the 3791. For additional information see the 3791 Configurator, GA27-2768-6. For power, see Specify [1] below; for cable, see M10000 for 3790. Host programs written for the IBM 3270 are not supported by the 3790 System.

For use with the 8100 Information System: For special features that are not supported, see M 8101 pages. A 3271 or 3272 is not required when the 3288 mdl 2 is attached to the 8101 with #1505 or #1506. For character set specify #9089. For power, see Specify [1] below. For cables, see M10000 pages for 8100 System. Host programs written for the 3270 are not supported by the 8100 System.

NOTES: (1) The 3288 Line Printer is recommended for use in a machine room environment due to its higher noise level while printing ... (2) The 3288 is supported by programming as a 3286 mdl 2 or 12 printer, unless Text Print Feature (#7880) is installed. The 3288 Text Data Stream, required for program support of feature #7880, is described in the 3270 Component Description Manual (and TNLS).

PREREQUISITE: A 3271 mdl 2 or 12, 3272 mdl 2, or 3274 mdl 1A, 1B, 1C or 1D. with appropriate Device/Terminal Adapter, or 8101 with #1505 or #1506. See M 8101 pages.

Supplies: A black ribbon, IBM Part No. 1136634 or equivalent, is required.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

- [2] Character Set: Specify one of the following;
- #9089 -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC typewriter keyboard. **PREREQUISITE:** If used with the 3271 mdl 2, EBCDIC Transmission Code (#9761) is required on the 3271 mdl 2.
 - #9091 -- for ASCII Character Set (A) (available at time of manufacture only) ... provides the 64 ASCII characters but substitutes the Logical OR (!) and Logical NOT (-) in place of the exclamation mark (!) and circumflex (^). **PREREQUISITE:** If used with the 3271 mdl 2, ASCII Transmission Code (#9762) is required on the 3271 mdl 2. If used with the 3271 mdl 12, ASCII Transmission Code (#1200) is required on the 3271 mdl 12.
 - #9092 -- for ASCII Character Set (B) (available at time of manufacture only) ... provides the standard 64 ASCII characters. **PREREQUISITE:** If used with the 3271 mdl 2, ASCII Transmission Code (#9762) is required on the 3271 mdl 2. If used with the 3271 mdl 12, ASCII Transmission Code (#1200) is required on the 3271 mdl 12.
 - #9093 -- for EBCDIC 'TN/T11' Character Set, with Sans Serif font print belt ... (available at time of manufacture only) ... provides the 120 characters of the 'TN/T11' print train (see Type Catalog, S/370 Printers page). **Prerequisites:** Text Print Feature (#7880) ... If used with the 3271 mdl 2, EBCDIC Transmission Code (#9761) is required on the 3271 mdl 2.

[3] X Print Error Indication: Specify #9944. To indicate an error an X is printed on the print line immediately below the last line normally printed.

[4] Vertical Forms Control: Specify #9850. Allows customer insertion of a Forms Feed Character (Hex OC) into the data stream. Upon detection of the Forms Feed character, the printer will skip to the first print line of the next form. The form length is

entered into two decade switches by the operator and is variable from 00 to 99. (The implementation of this feature is the customer's responsibility.)

[5] Cables: See M 10000 pages for 3288 cable prices and ordering instructions. For cable specifications see 3270 Installation Manual - Physical Planning, GA27-2787.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3288	2	\$ 384	\$ 327	\$10,625	\$ 91

Plan Offering: Plan B Warranty: B Machine Group: D
 Purchase Option: 60% Useful Life Category: 1 Per Call: 1
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%

SPECIAL FEATURES

TEXT PRINT FEATURE (#7880). [Mdl 2 only and attached to 3271 or 3272] Provides 120 character set 'TN/T11' (see Type Catalog, S/370 Printers) logic. Also provides character underscore and overstrike (accomplished with a new order inhibiting line advance). **Field Installation:** Yes. **Limitation:** Available on 3288s attached to 3271 mdl 2 or 12, or 3272 mdl 2 only. **Maximum:** One. **Prerequisite:** For new orders, use character set specify code #9093. For field upgrades, an order for a Text Print Belt - Additional (#5921) must accompany the MES order for feature #7880, and specify #9093 is not used. Note that if the 3288 is attached via a 3271 mdl 2, EBCDIC Transmission Code (#9761) is required on the 3271 mdl 2.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Text Print Feature #7880	\$ 45	\$ 38	\$1,405	\$ 1.00

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND (#4450) -- Permits feeding of continuous forms from the carton and provides for forms stacking after printing. This accessory is a one-shelf forms stand.

EBCDIC PRINT BELT (#5920-Additional). Permits printing of the 64 character set.

TEXT PRINT BELT (#5921-Additional). Sans Serif font characters. Permits printing of the 120-character TN/T11 character set.

IBM 3289 LINE PRINTER

Purpose: A series of line printers for attachment to a 3274 Control Unit, a 3276 Control Unit Display Station, or an 8100 Information System via the Loop, at carrier speed and data rate of 9600 bps maximum.

Highlights: Line printing is from characters engraved on a revolving metal belt. The 3289 models operate at the following speeds:

	Maximum Lines Per Minute *	Character Set
Model 1	155	48
	120	64
	80	94
	40	125 Text
Model 2 and 3	400	48
	300	64
	230	94
	160	125 Text

* Actual printer throughput is dependent on operational and system characteristics. Maximum print speed may be degraded by such factors as communication line speed, control unit load, application program, loop speed, print line length, and multiple device operation.

Included is one interchangeable print belt (48, 64 or 94 character set) — see "Specify." A variable width forms tractor for feeding of marginally punched continuous forms (one to six parts) up to 15" overall width is provided. The following functions are basic: paper jam detection; front forms loading; vertical forms control; Systems Printer Communications (SCS mode on mdl 1 and 2 only); end-of-forms detection; single/double vertical spacing on mdl 1, 2; 132 print positions; character spacing of 10 per inch; line spacing of 6 or 8 lines per inch; 4016 byte buffer on mdl 1 and 2; 256 byte alternating buffers on mdl 3; and SNA Character String (EBCDIC only) data stream handling. Standard color accent panel will be pebble gray;

Concurrent printer (model 3) and card read/punch operation is possible. See Special Features.

Limitations: Refer to GA24-3488 for forms design considerations. Printed output is not supported for optical character reading.

PREREQUISITE: For mdl 1, 2, a 3274 Control Unit with appropriate adapter, or a 3276 Control Unit Display Station. See 3274 and 3276 for details. For mdl 3, an 8100 Loop is required. See 8100 Processor pages for details.

Problem Determination Procedures — Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the operator. See Customer Responsibilities below.

Customer Set-Up (CSU) — The 3289 mdl 1 and 2 are designed as Customer Set-Up thereby offering the customer early availability and relocation flexibility. Pre-installation Planning responsibilities are covered in 3270 Set-Up Planning Guide, GA27-2827.

Customer Responsibilities: The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at the customer's receiving dock, unpacking, and placement of the 3289.
- Physical setup, connection of cables, switch settings, and check out. (Mdl 1 and 2)
- Notify IBM of intent to relocate and follow IBM instructions for relocation. (Mdl 1 and 2)
- Use and follow the problem determination procedures and fill out trouble report prior to calling IBM for service.
- Disconnecting, packing, and removal to the customer's shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM. (Mdl 1 and 2)

Supplies: Black ribbon, IBM Part No. 1136634 or equivalent for model 1, or IBM Part No. 1136670 or equivalent for models 2 and 3, are required

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage (120 AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug.

[2] Power Cord: If standard 2.8m (9 foot) power cord is not desired, specify #9511 for 1.8m (6 foot) power cord, #9512 for 3.7m (12 foot) power cord, or #9513 for 4.6m (15 foot) power

cord.

[3] Print Belt Character Set: Specify One. Available at time of manufacture only. If more than one belt is required, see Accessories below and M10000 pages.

- #9490 -- 48 Character Set EBCDIC
- #9491 -- 64 Character Set EBCDIC
- #9492 -- 94 Character Set EBCDIC
- #9493 -- 48 Character Set ASCII (B)**
- #9494 -- 64 Character Set ASCII (B)**
- #9495 -- 94 Character Set ASCII (B)**
- #9496 -- 125 Character Text Print EBCDIC

** SNA Character String Mode of Operation is not available with ASCII. ASCII belts available for models 1 and 2 only.

NOTE: The Character Set specified (EBCDIC or ASCII) must be the same as the Transmission Code/Character Set used on the control unit to which it is attached.

[4] Cables: For mdl 1 and 2 -- Customer is responsible for procurement, maintenance, and installation of co-axial signal cable. See M10000 pages for cable prices and ordering instructions. See 3270 *Installation Manual - Physical Planning*, GA27-2787, for cable details. For mdl 3 -- Customer is responsible for procurement, maintenance and installation of the Loop network as defined in the IBM 8100 Information System Installation Manual - Physical Planning. A signal cable with a standard Loop polarized plug is supplied with the printer.

[5] Print Error Indication #9488: An error graphic is printed on line immediately below the last print line for that data buffer when the printer is used in 3270 data stream mode. **Limitation:** Model 1 and 2 only.

[6] Character Print Operation: To specify the printer buffer size when the printer is used in 3270 data stream mode. **Limitation:** Model 1 and 2 only.

#9521 (960 character print) ... for use with a program which assumes the buffer size is 960 bytes while using Erase/Write Alternate Command.

#9522 (1920 character print) ... for use with a program which assumes the buffer size is 1920 bytes while using Erase/Write Alternate Command.

#9523 (2560 character print) ... for use with a program which assumes the buffer size is 2560 bytes while using Erase/Write Alternate Command.

#9524 (3440 character print) ... for use with a program which assumes the buffer size is 3440 bytes while using Erase/Write Alternate Command.

#9525 (3564 character print operation) ... for use with a program which assumes the buffer size is 3564 bytes while using Erase/Write Alternate Command. **Limitation:** This specify code only valid when 3289 is attached to a 3274 mdl 1A, 1C or 1D.

NOTE: To provide compatibility with programs written for 3271/3272 using Erase/Write Command, #9521 provides 480 character print operation and #9522, #9523, #9524 and #9525 provide 1920 character print operation. Allowable usage in SNA Character String of the full buffer varies according to the control unit (3274 or 3276) to which the printer is attached and to programming considerations. See *IBM Information Display Component Description*, SRL GA27-2749, for details. Copy operation from larger screen size display to smaller printer buffer is not accepted.

[7] System Attachment: Identify the attaching control unit by specifying the following codes:

Control Unit	Code	System Control Unit	Code
3274 mdl 1A	#9549	3276 mdl 1-4	#9552
3274 mdl 1B	#9550	3276 mdl 11-14	#9553
3274 mdl 1C	#9551	8100	#9606
3274 mdl 1D	#9261		

PRICES: Mdl	MRC	MLC 2 year	Purchase	MMMC
3289 1	\$368	\$313	\$ 8,900	\$105
2	556	473	13,250	179
3	556	473	13,250	179

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 55% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Not field installable.

3289 Line Printer (cont'd)
SPECIAL FEATURES

AUDIBLE ALARM (#1090). Sounds an alarm that alerts the operator of conditions that require manual intervention. The operator can set loudness level and, on models 1 and 2 only, duration (short or continuous). **Field Installation:** Yes. **Customer Set-Up:** No.

TEXT PRINT FEATURE (#1130). [Mdl 1 and 2 only] Provides the capability to print 32 Text characters in addition to 93 characters of the 94-character EBCDIC set. 3289 Line Printers with and without this feature may be mixed on the 3276 Control Unit Display with APL/Text Control feature (#1067) or on the same appropriately configured 3274 Control Unit along with 3278 Display Stations and 3287 Printers with and without the APL/Text (#1120) feature and on the 3274 only, may be mixed with 3277 Display Stations and 3284, 3286, 3287 and 3288 printers without the Data Analysis-APL (#1066) feature. **Limitations:** The Text print belt used with this feature is only interchangeable with the 48/64/94-character set EBCDIC print belt. This feature is only valid on a 3289 Line Printer attached to a 3274 mdl 1A, 1C or 1D, customized to include the 3289 Text Print Control Function or to a 3276 with APL/Text Control feature (#1067). **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Prerequisite:** For new orders, use Print Belt Character Set specify code #9496. For field installation, an order for a Text Print Belt, Additional (#5824) must accompany the order for this feature (#1130).

KEYLOCK (#4650). [Mdl 3 only] Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the printer. Two identical keys are supplied with the feature. Refer to M10000 pages for information on additional or replacement keys. **Field installation:** Yes. **Customer Set-Up:** No.

CARD CONTROL FEATURE (#8010). [Mdl 3 only] Provides additional storage and control for specific card I/O attachment. Required once only for any card attachment feature(s). **Field installation:** Yes. **Customer Set-Up:** No.

3501 CARD READER ATTACHMENT (#8050). [Mdl 3 only] To attach a 3501 Card Reader. **Maximum:** One. **Limitation:** Cannot be installed with 3782/2502 Card Reader Attachment (#8149). **Prerequisite:** Card Control Feature (#8010). **Field installation:** Yes. **Customer Set-Up:** No.

3782/2502 CARD READER ATTACHMENT (#8149). [Mdl 3 only] To attach a 3782 Card Attachment Unit mdl 2 and a 2502 Card Reader mdl A1. The 2502 can be equipped with special features for 51/80 or 66/80 column cards. **Maximum:** One. **Limitation:** Cannot be installed with 3501 Card Reader Attachment (#8050). Optical Mark Read Feature (#5450) on 2502 is not supported. **Prerequisite:** Card Control Feature (#8010). **Field installation:** Yes. **Customer Set-Up:** No.

3782/3521 CARD PUNCH ATTACHMENT (#8150). [Mdl 3 only] To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. **Maximum:** One. **Limitations:** If a 2502 or 3501 Card Reader is also attached (#8050 or #8149), the Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only. Simultaneous operation of a 3521 equipped with Card Print Feature (#1501) with a Card Reader (3501 or 2502) is not permitted. Simultaneous operation of printer, reader, and punch without Card Print is permitted. **Prerequisite:** Card Control Feature (#8010). **Field installation:** Yes. **Customer Set-Up:** No.

Special Feature Prices:		MLC		Purchase	MMMC
		MRC	2 yr		
Audible Alarm	#1090	\$ 6	\$ 5	\$ 175	N/C
Text Print Feature	1130	7	6	210	N/C
Keylock	4650	35 SUC	-	35	N/C
Card Control Feature	8010	29	25	875	\$ 1.50
3501 Card Reader Attch	8050	13	11	440	.50
3782/2502 Cd Rdr Attch	8149	19	16	640	4.00
3782/3521 Cd Pch Attch	8150	19	16	640	3.50

Accessories: The following items are available on a purchase only basis. For shipment with machine order the Feature # indicated below at the price listed in the M10000 pages. See M10000 pages for additional information and field installation.

Print Belt, Additional -- permits the customer to obtain more than one character set print belt.

- #5811 -- 48-character ASCII (B) *
- #5812 -- 64-character ASCII (B) *
- #5813 -- 94-character ASCII (B) *
- #5821 -- 48-character EBCDIC
- #5822 -- 64-character EBCDIC
- #5823 -- 94-character EBCDIC
- #5824 -- 125-character Text Print EBCDIC

* Models 1 and 2 only.



DP Machines

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**IBM 3289 LINE PRINTER
Model 4**

Purpose: A line printer for attachment to a 4331 Processor.

Highlights: Line printing is from characters engraved on a revolving metal belt. The 3289 mdl 4 operates at the following speeds:

Maximum Lines Per Minute *	Character Set
400	48
300	64
230	94

* Actual throughput is dependent upon operational and system characteristics. Maximum print speed may be degraded by such factors as control unit load and the application program.

included is one interchangeable print belt (48, 64 or 94 character set) ... see "Specify." A variable width forms tractor for feeding marginally punched continuous forms (one to six parts) up to 38.1cm (15") overall width is provided. The following functions are basic: paper jam detection ... front forms loading ... universal character set buffer ... end of forms detection ... 132 print positions ... character spacing of 10 per inch ... line spacing of 6 or 8 lines per inch and vertical channel select (under 4331 Processor control). The standard color accent panel is pebble gray;

Limitations: Refer to *Forms Design Reference Guide, GA24-3488* for forms design considerations. Printed output is not supported for optical character reading.

Prerequisite: A position on the standard Display/Printer Adapter on a 4331 Processor. see 4331 for details.

Problem Determination Procedures: Significant function has been designed into this unit to increase availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the customer. See "Customer Responsibilities" below.

Customer Setup (CSU): The 3289 mdl 4 is designated as Customer Setup thereby offering the customer early availability and relocation flexibility. Pre-installation planning responsibilities are covered in *3289 Model 4 Site Preparation Guide, GA27-3198*.

Customer Responsibilities: The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at the customer receiving dock, unpacking and placement of the 3289.
- Physical setup, connection of cables, switch settings and check out.
- Contacting Field Engineering to make cable connections of IBM CSU units to IBM non-CSU units where customer access areas are not provided.
- Notifying IBM of intent to relocate and following IBM instructions for relocation.
- Using and following the problem determination procedures and filling out the trouble report prior to calling IBM for service.
- Disconnecting, packing and removal to the customer's shipping dock at time of discontinuance. Appropriate instructions will be provided by IBM.

Supplies: Black ribbons, IBM Part No. 1136670, or equivalent, are required

Bibliography: See KWIC Index, G320-1621, or specific system bibliography.

SPECIFY

- **Voltage** (120V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, #9891 for non-lock plug.
- **Power Cord:** If standard 2.8 meter (9 foot) power cord is not desired, specify #9511 for 1.8 meter (6 foot) cord, #9512 for 3.7 meter (12 foot) cord, or #9513 for 4.6 meter (15 foot) cord.
- **Print Belt Character Set:** Specify One. Available at time of manufacture only. If more than one print belt is required, see "Accessories" below and M 10000 pages.
 - #9490 -- 48-character set EBCDIC
 - #9491 -- 64-character set EBCDIC
 - #9492 -- 94-character set EBCDIC
- **Cables:** Customer is responsible for procurement, installation

and maintenance of coaxial signal cable. See M 10000 pages for cable prices and ordering instructions. For cable details, see *3270 Installation Manual - Physical Planning, GA27-2787*.

Prices:	Mdl	MRC	MLC 2Yr	Purchase	MMM
	3289 4	\$556	\$473	\$13,250	\$179

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 55% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Field changes of Model 2 to/from Model 4 are not recommended. All other 3289 model changes are available at time of manufacture only.

ACCESSORIES: The following items are available on a purchase only basis. For shipment with the 3289, order the Feature # indicated below at the price listed in the M 10000 pages. See M 10000 pages for additional information and field installation.

Print Belt, Additional -- permits the customer to obtain more than one character set print belt.

Description

- #5821 -- 48-character EBCDIC
- #5822 -- 64-character EBCDIC
- #5823 -- 94-character EBCDIC



IBM 3310 DIRECT ACCESS STORAGE

Purpose: Direct access storage for attachment to a 4331 Processor.

Disk Storage and Control

Model A1 Single-drive disk storage and associated control for attachment to a 4331 Processor via its DASD Adapter (#3201). It also provides the logic required to support attachment of up to three additional spindles for a maximum string of four.

Model A2 Two disk storage drives and associated control for attachment to a 4331 Processor via its DASD Adapter (#3201). It also provides the logic required to support attachment of up to two additional spindles for a maximum string of four.

Disk Storage

Model B1 Single-drive storage unit which attaches to a Model A2 to provide for configurations requiring three (3) drives.

Model B2 Two disk storage drives which attach to a Model A2 to provide for configurations requiring a full string of four (4) drives.

Drive Configurations: Drives are attached as follows:

- One Drive A 3310 model A1
- Two Drives A 3310 model A2
- Three Drives A 3310 model A2 and a 3310 model B1
- Four Drives A 3310 model A2 and a 3310 model B2

Highlights: The 3310 employs a fixed storage medium and features high data rate, fast access, modularity and a high degree of reliability.

Capacity — each drive has a capacity of 64,520,192 bytes.

Format — uses fixed block architecture and the cylinder concept providing the following:

Bytes per Sector	512
Sectors per Cylinder	352
Bytes per Cylinder	180,224
Cylinders per Drive	358

Access Time — Seek Time (MS)

Minimum	9
Average	27

Average Rotational Delay (MS) 9.6

Data Rate — 1,031,000 bytes per second.

Rotational Positioning Sensing — permits the disk storage device to disconnect during rotational delay, thereby increasing DASD Adapter availability for other operations.

Error Correction — provides capability of correcting single data error bursts of up to 3 bits span as well as detecting all single error bursts of up to 14 bits span.

Prerequisites: A 3310 mdl A1 or A2 requires a position on the DASD Adapter (#3201) on a 4331 Processor ... a 3310 mdl B1 or B2 requires a 3310 mdl A2.

Maximum: See DASD Adapter (#3201) under "Special Features" for the 4331 Processor.

Bibliography: GA26-1660

SPECIFY

- **Voltage:** (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9914 for 240 V.
- **Color:** [A models only] #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray. **Note:** One accent panel from the model A unit is exchanged with the outer side panel of the model B unit.

PRICES	Mdl	MRC	MLC 2 Yr	Purchase	MMMC/ AMMCR
3310	A1	\$423	\$360	\$12,960	\$53
	A2	703	598	21,530	90
	B1	335	285	10,260	40
	B2	615	523	18,830	77

Plan Offering: Plan D Machine Group: D Per Call: 3
Purchase Option: 60% Warranty: B Useful Life Category: 2
Termination Charge Months: 5 Termination Charge Percent: 25%
Initial Period of Maintenance Service: 3 mos.
Upper Limit Percent: 5%

Model Changes: Model changes between mdl A1 and A2 or between mdl B1 and B2 are field installable. Model changes between mdl A and mdl B units cannot be made.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

Model A1 to A2 ... \$8,570
Model B1 to B2 ... 8,570

IBM 3330 DISK STORAGE

Purpose: Large capacity, fast access, high data rate storage for general purpose data storage and programming system residence.

Model 1 Contains two disk storage drives ... available on S/360 mdl 195, any S/370 Processor except 3115, ... available on the 4341 Processor.

Model 2 Contains one disk storage drive ... available on S/360 mdl 195, all S/370 Processors except 3115 ... available on the 4300 Processor.

Model 11 Contains two disk storage drives ... available on all virtual storage S/370 Processors except 3115 and 3125 ... available on the 4341 Processor.

Highlights: Each drive uses an electromagnetic actuator to move and control the head assembly.

Cylinder Concept - 404 data cylinders per pack for mdls 1 and 2 ... 808 data cylinders per pack for mdl 11. Each cylinder has 19 data tracks ... up to 13,030 bytes per track ... up to 247,570 bytes available per cylinder.

Data Rate - 806,000 bytes per second.

Access Time - average access time is 30 milliseconds with a minimum of 10 milliseconds and a maximum of 55 milliseconds.

Power Drawers - each disk drive is mounted in a drawer ... opened or closed by a switch on the operator control panel.

Write Inhibit Switch - a toggle switch for each drive, mounted on the operator's panel, which provides the means to protect packs mounted within the facility from being written upon. The switch is manually set by the system operator under instructions from the customer operating procedure. Programming Support then protects the user's data by terminating a program which attempts to write to a protected drive.

Write Format Release - standard feature on the mdl 11, which frees the subsystem while the drive erases from the end of a "formatted" write record to the end of the track.

Rotational Position Sensing - enables a "seek" to an explicit position on a track ... permits channel disconnect during most of the rotational latency period and thus contributes to increased channel availability ... requires one unshared subchannel on a block multiplexer channel for each drive.

Multiple Requesting - allows multiple channel command sequences to be active, up to one sequence per drive ... permits better utilization of control unit, devices, channel and CPU ... requires one unshared subchannel on a block multiplexer channel for each drive.

Disk Pack - each drive requires a 3336 Disk Pack. The 3336 mdl 1 provides up to 100 million bytes of storage per pack. The 3336 mdl 11 provides up to 200 million bytes of storage per pack. The 3336 mdl 1 is interchangeable on all 3330 mdls 1 and 2 and 3333 mdl 1 drives; it cannot be used with the 3330 mdl 11. The 3336 mdl 11 is interchangeable on all 3330 mdl 11 and 3333 mdl 11 drives; it cannot be used with the 3330 mdl 1 or 2.

PREREQUISITES: The 3330 mdls 1 and 2 are designed for interconnected operation with the 3333 mdl 1, 3333 mdl 11, or the 3830 mdl 1. The 3330 mdl 11 is designed for interconnected operation with the 3333 mdl 1 or mdl 11. Customers who wish to order a 3330 for stand-alone or individual use should submit an RPQ to provide the necessary safety elements (covers, cable connectors, etc.) to complete the unit for a non-standard (i.e., not installed as part of a 3330 facility) environment. In lieu of the RPQ, the customer may provide safety elements equivalent to the standard configuration or that provided by the above RPQ. If not provided, the unit will be offered on a purchase only basis. See item [2] under "Specify."

See appropriate DASD storage control feature or machine to determine prerequisite specify and/or special features to attach 3333/3330s.

Agreement for IBM to install and maintain the 3330 in any non-standard configuration must be reviewed

Each disk storage drive requires a 3336 Disk Pack. These must be ordered separately

Maximum: Up to four 3330 modules, in any combination of mdls 1 and 2, can be attached to the 3830 mdl 1. Up to three 3330 modules, in any combination of mdls 1, 2 or 11, can be attached to the 3333 mdl 1 or 11 ... see system availability under "Models" above. On the S/370 mdl 125, only one 3330 module, either mdl 1 or 2, can be attached to the 3333 mdl 1. For combinations allowed on a Storage Director of a 3880 Storage Control, see "Maximum" under 3880.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... voltage must be consistent with that of the unit to which the 3330 is to be attached.

[2] Non-standard Environment: #9485 ... must be specified if the 3330 is not to be installed as part of a 3330 facility ... also see "Prerequisites" above.

[3] Position Designator: For cable definition and drive identification (Ready Indicator and Logical Address Plug), one position designator code must be specified for each 3330, indicating its relative position as shown in the diagram below:

3830 mdl1	#9491	#9492	#9493	#9494
3333		#9492	#9493	#9494

NOTE: If any configuration change (increase or decrease) results in a position change of installed units, their position designator codes must be changed for rental machines.

If an installed 3830 mdl 1/3330 configuration is being changed to a 3830 mdl 2/3330 series configuration and the 3330 with position designator code #9493 has serial no. 12490 or below, BM 2276789 (60 Hz) must be ordered via for rental machines.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
3330	1	\$1,450	\$1,218*	\$32,380	\$170
	2	862	734**	19,340	100
	11	2,070	1,739***	46,090	170

Plan Offering: Plan B Per Call: 3 Machine Group: A
Purchase Option: 60% Warranty: B Useful Life Category: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

* Fixed Term Plan Prices are: 12-23 mos. = \$1,334,
24 mos. = \$1,218.

** Only ETP and MLC prices apply.

*** Fixed Term Plan Prices are: 12-23 mos. = \$1,904,
24 mos. = \$1,739.

Model Changes: Mdl 1 to mdl 11 is field installable. Mdl 2 to mdl 1 or 11 available at time of manufacture only.

When ordering model change for field installation on 3135/3135-3 and 3138 systems, check for appropriate prerequisite specify feature (microcode diskette) on the IFA. Refer to appropriate processing unit sales manual pages.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 1 to Model 11 \$13,710

IBM 3333 DISK STORAGE AND CONTROL

Purpose: Large capacity, fast access, high data rate storage for general purpose data storage and programming system residence with additional control for the attachment of up to three 3330 Disk Storage modules.

Model 1 Contains two disk storage drives. Available on S/360 mdl 195, any S/370 Processor except 3115 ... available on the 4341 Processor.

Model 11 Contains two disk storage drives. Available on all virtual storage S/370 Processors except 3115 or 3125 ... available on 4341 Processor.

Highlights: Each drive uses an electromagnetic actuator to move and control the head assembly.

Cylinder Concept - 404 data cylinders per pack for mdl 1 ... 808 data cylinders per pack for mdl 11. Each cylinder has 19 data tracks ... up to 13,030 bytes per track ... up to 247,570 bytes available per cylinder.

Data Rate - 806,000 bytes per second.

Access Time - average access time is 30 milliseconds with a minimum of 10 milliseconds and a maximum of 55 milliseconds.

Power Drawers - each disk drive is mounted in a drawer ... opened or closed by a switch on the operator control panel.

Write Inhibit Switch - a toggle switch for each drive, mounted on the operator's panel, which provides the means to protect packs mounted within the facility from being written upon. The switch is manually set by the system operator under instructions from the customer operating procedure. The operating systems program-

3333 Disk Storage and Control (cont'd)

ming support then protects the user's data by terminating a program which attempts to write to a protected drive.

Write Format Release - standard feature on the mdl 11, which frees the subsystem while the drive erases from the end of a "formatted" write record to the end of the track.

Rotational Position Sensing - enables a "seek" to an explicit position on a track ... permits channel disconnect during most of the rotational latency period and thus contributes to increased channel availability ... requires one unshared subchannel on a block multiplexer channel for each drive.

Multiple Requesting - allows multiple channel command sequences to be active, up to one sequence per drive ... permits better utilization of control units, devices, channel, and CPU ... requires one unshared subchannel on a block multiplexer channel for each drive.

Disk Pack - each drive requires a 3336 Disk Pack. The 3336 mdl 1 provides up to 100 million bytes of storage per pack. The 3336 mdl 11 provides up to 200 million bytes of storage per pack. The 3336 mdl 1 is interchangeable on all 3333 mdl 1 and 3330 mdl 1 and 2 drives; it cannot be used with the 3333 mdl 11. The 3336 mdl 11 is interchangeable on all 3333 mdl 11 and 3330 mdl 11 drives; it cannot be used with the 3333 mdl 1.

PREREQUISITES: Each disk storage drive requires a 3336 Disk Pack. These must be ordered separately ... see IRD Sales Manual.

See appropriate DASD storage control feature or machine to determine prerequisite specify and/or special features to attach 3333/3330s.

Each system attachment requires a specify code ... see "Specify" below.

NOTE: If a 3333/3330 configuration is replacing a 3830 mdl 1/3330 configuration (or any configuration change is made where installed 3330s are repositioned with respect to a 3333), the position designator Specify codes of the 3330s must be changed ... see 3330.

Maximum: S/370 mdl 125, one 3333 mdl 1 (with associated 3330s) ... For other systems, see 3135, 3135-3, 3138, 3145, 3145-3, 3148, 3158, 3158-3, 3168, 3168-3, 3031, 3032, 3033, 3830 mdl 2, 3830 mdl 3, 3880.

Bibliography: GC20-0001

Maintenance: Agreement for IBM to install and maintain the 3333 in any non-standard configuration must be reviewed

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V. **NOTE:** The 3333 requires a 60 amp AC power cord. Consult Physical Planning.

[2] System Attachment: One of the following must be specified:

370/125 *	#9586	3345 mdls 3, 4, 5	9583
3830 mdl 2	9581	370/158 ISC	9584
370/135, 135-3 IFA	9582	370/168 ISC	9585
370/138 IFA	9579	370/158 ISC w (#7220)	9587
370/145, 145-3 ISC	9583	370/168 ISC w (#7220)	9588
370/148 ISC	9580	3830 mdl 3	9589
3880	9604		

* The 370 mdl 125 is not valid for the String Switch (#8150).

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC	
	3333	1	\$1,810	\$1,540	\$40,580	\$199
		11	2,426	2,065	54,290	199

Plan Offering: Plan B. Per Call: 3 Machine Group: A
Purchase Option: 60% Warranty: B Useful Life Category: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Mdl 1 to mdl 11 is field installable.

When ordering model change for field installation on 3135/3135-3 and 3138 systems, check for appropriate prerequisite specify feature (microcode diskette) on the IFA. Refer to appropriate processing unit sales manual pages.

MODEL UPGRADE PURCHASE PRICE (There are no additional installation charges)

Model 1 to Model 11 \$13,710

SPECIAL FEATURES

REMOTE SWITCH ATTACHMENT (#8148). To attach the String Switch (#8150) to a configuration control panel. **Field Installation:** Yes. **Prerequisite:** String Switch: (#8150).

STRING SWITCH (#8150). To attach the 3333 to a second attachment. The two attachments may be on the same CPU or different CPUs and may be any two of the following: 3830 Storage Control mdl 2, 3880 Storage Control, the S/370 mdl 135, 135-3, 138 3330/3340 Series IFA (#4655), the 3345 Storage and Control mdls 3, 4 and 5 or the ISC (#4660) for attachment to S/370 mdl 145, 145-3, 148, and the S/370 mdl 158 and 168 ISCs (#4650) ... see appropriate machines for additional requirements. The String Switch may also be installed on a 3333 within a 3850 Mass Storage System with attachment to a 3830 mdl 3 or S/370 ISC (#4650) with Staging Adapter (#7220). Installation is not recommended in a mixed 3850 MSS/non-MSS environment. If a 3333 is shared between any two ISC paths and/or 3830 mdl 3s, then any other 3333s attached to the same ISC paths and/or 3830 mdl 3s must also be shared identically. In all of the above cases, switching between the two attachments is under program control. The 3333s may also be dedicated to a single attachment with an enable/disable switch. **Field Installation:** Yes. **Specify:** To indicate the attachment to which this feature will be made, specify one of the following:

3830 mdl 2	#9591	370/158 ISC	9594
370/135, 135-3 IFA	9592	370/168 ISC	9595
370/138 IFA	9601	370/158 ISC w (#7220)	9597
3345 mdls 3, 4, 5	9593	370/168 ISC w (#7220)	9598
370/145, 145-3 ISC	9593	3830 mdl 3	9599
370/148 ISC	9602	3880	9605

NOTE: Installed 3333s retained for use with 3850 Mass Storage System

System Attachment Specify Features must be changed on presently installed 3333s attached to a 3830 mdl 2 or 3158/3168 ISC (#4650), if the 3333s will be retained for use with a 3850 MSS when a 3830 mdl 2 is field upgraded to mdl 3 or Staging Adapter for ISC (#7220) is field installed on the 3158/3168 ISC. Submit

Specify Feature Changes

Remove	Install
9581	9589
9584	9587
9585	9588

If the installed 3333s are equipped with String Switch (#8150), the Specify Features indicative of String Switch attachment are also to be changed

Specify Feature Changes

Remove	Install
9591	9599
9594	9597
9595	9598

Special Feature Prices:	MAC/ MRC	ETP/ 2 Yr	Purchase	MMMC
Remote Switch Attach	#6148	NC	NC	NC
String Switch	8150	\$223	\$190	\$5,760 \$ 9.50

3336 DISK PACK

Model 1 - removable and interchangeable disk storage for the 3333 Disk Storage and Control mdl 1 and 3330 Disk Storage mdls 1 and 2.

Model 11 - removable and interchangeable disk storage for the 3333 Disk Storage and Control mdl 11 and the 3330 Disk Storage mdl 11.

The 3336 is marketed by IRD ... for details and prices,

IBM 3340 DIRECT ACCESS STORAGE FACILITY

Purpose: Multiple capacity, high-speed, direct access storage for attachment to any virtual storage S/370 or 4300 Processors.

For possible use with S/3 or S/7, see GSD manual.

Model A2 Two disk storage drives and associated control for attachment to a 3115 or 3125 via their native attachments, to the 3135, 3135-3, 3138 via the IFA (#4655), to 3145 mdls GE, GFD, H, HG or I via the 3345 mdl 3, 4 or 5, to 3145 mdl H2, HG2, I2, IH2, J2, JI2 or K2, 3145-3, 3148 via the ISC (#4660), to the 4331 Processor via the 3340 Direct Attach feature (#7851), to the 3158, 3158-3, 3168 or 3168-3 via the ISC (#4650), to the 3830 mdl 2, and to the 3880. It provides logic and power for the attachment of up to three 3340 mdl B units and/or 3344 units (3344 not attachable to 4331).

Model B1 Contains one disk storage drive. Can be intermixed with the 3340 mdl B2 and/or 3344 units to provide 3, 5 or 7 drive configurations (3344 not attachable to 4331).

Model B2 Contains two disk storage drives. Up to three 3340 mdl B2s can be attached to a 3340 mdl A2 (3344 not attachable to 4331).

Model Changes: Available at time of manufacture only.

Highlights: Each 3340 contains an air filtration system and the load/unload mechanism for the 3348 Data Module. It features low cost, multiple capacity, fast access and high data rate ... up to 4 drives attach to a 3115-0, up to 8 drives to a 3115-2 or a 3125-0, up to 16 drives to a 3125-2 with 16 Drive Expansion (#9315), and up to 16 drives to a 4331. See 3135, 3135-3, 3138, 3145, 3145-3, 3148, 3158, 3158-3, 3168, 3168-3, 3031, 3032, 3033, 3345, 3830, 3880, 4331 or 4341 for other S/370 or 4300 Processor attachment capabilities.

The 3340 introduces a new design in which a sealed cartridge (3348 Data Module) contains the disks, access arms, read/write heads and spindle. Multiple capacity options on each drive become possible due to the modularity provided by this unique design. In addition, the 3348 mdl 70F contains fixed heads which provide low cost, fixed head capability for the 3340 user. The user may place selected components of IBM software as well as his own programs in the fixed head area to increase device performance. The 3348 mdl 70F requires the Fixed Head Feature on the 3340. See "Special Features."

Cylinder Concept:	3348 mdl 35 (34.9 MB)	3348 mdl 70 or 70 F (69.8 MB)
Bytes per Track	8,368	8,368
Tracks per Cylinder	12	12
Cylinders per Data Module	348	696
Bytes per Cylinder	100,416	100,416

Data Rate: 885,000 bytes per second.

Access Time: For the 3348 mdl 35 and 70, the average seek time is 25 ms with a minimum of 10 ms and a maximum of 50 ms. For the mdl 70F, the average seek time is 0 ms for cylinders 1 through 5 while all other cylinders retain the above seek timing. Rotation time is 20.2 ms and latency is 10.1 ms, the same as for the 3348 mdls 35 and 70.

Autoloading: Data modules are automatically loaded after the Data Module is placed in the drive, the drive cover is closed and a switch is turned on. The Data Module is a sealed unit and requires no cover removal. Start up time is less than 20 seconds.

Read Only: A switch is provided on every 3340 drive. This switch is activated by inserting a latch in the Data Module. When the latch is NOT inserted, the Data Module is protected from being written upon or erased.

Data Modules: Each drive requires a Data Module to operate. These must be ordered separately ... see 3348.

3348 Data Module mdl 35 provides 34,944,768 bytes of storage.

3348 Data Module mdl 70 provides 69,889,536 bytes of storage.

3348 Data Module mdl 70F provides 69,889,536 bytes of storage of which 502,080 are accessible by fixed heads.

Either the mdl 35 or the mdl 70 may operate on any drive and they are interchangeable between drives, including drives with the Fixed Head Feature (#4301, #4302) installed. The mdl 70F, however, requires the Fixed Head Feature (#4301, #4302) on the drive.

Data written on a Data Module by S/3 cannot be retrieved by S/370 and vice versa. Data written on a Data Module by a S/3 mdl 12 or 15 may be read by a 4331 using System/3 Data Import feature (#6305).

PREREQUISITES: A 3340 facility requires — a 3340 mdl A2 ... a S/370 or 4300 Processor with appropriate attachment and features ... each 3340 drive requires a 3348 Data Module. A 3145 requires Word Buffer (#8810) to attach 3340s.

See appropriate DASD storage control feature or machine to determine additional prerequisite specify and/or special features to attach 3340s.

Maximum: 3115-0 — four 3340 drives
3115-2 — eight 3340 drives
3125-0 — eight 3340 drives
3125-2 — sixteen 3340 drives
Other S/370 or 4300 Processors — see 3135, 3135-3, 3138, 3145, 3145-3, 3148, 3158, 3158-3, 3168, 3168-3, 3031, 3032, 3033, 3345, 3830 mdl 2, 3880, 4331 or 4341.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] System Attachment: One of the following must be specified on each 3340 mdl A2: (For System/3 Specify Codes, see GSD manual)

ATTACHMENT	SPECIFY	ATTACHMENT	SPECIFY
3830 mdl 2	#9581	S/370 mdl 168 ISC	#9585
S/370 mdl 135 IFA	9582	S/370 mdl 125 DDA	9586
S/370 mdl 135-3 IFA	9582	S/370 mdl 115 DDA	9587
S/370 mdl 138 IFA	9579	S/370 mdl 145 ISC	9588
3345 mdls 3, 4, 5	9583	S/370 mdl 145-3 ISC	9588
S/370 mdl 158 ISC	9584	S/370 mdl 148 ISC	9580
System/7	9590	4331 - 3340 Dir Attach	9606
3880	9607		

[4] If String Switch (#8150) is ordered or installed on 3340 mdl A2, String Switch (#9570) must be specified on each 3340 mdl B1 or B2 in the string.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3340	A2	\$1,100	\$ 936	\$36,000	\$ 92
	B1	615	523	19,800	49
	B2	776	660	25,200	79

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 60% Useful Life Category: 2 Per Call: 3
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES

FIXED HEAD FEATURE (#4301, 4302). #4301 — for model A2 or B2 ... #4302 — for model B1. To operate the 3348 mdl 70F on the 3340. The Fixed Head Feature is available on S/370 VS systems from the 115 and up, and 4300 Processors. Attachment is via the following: On the S/370 mdl 115 and 125 via their native attachment, the 3830 Storage Control mdl 2, the 3880 Storage Control, the 3330/3340 Series IFA (#4655) on the S/370 mdl 135, 135-3, 138, the 3345 Storage Control Frame mdl 3, 4 or 5 or the ISC (#4660) on the S/370 mdl 145, 145-3, 148, the S/370 mdl 158 and 168 ISCs (#4650), and to the 4331 Processor via the 3340 Direct Attach feature (#7851) ... see appropriate machines for additional requirements (Specify, Special Features, Etc.). **Limitations:** Cannot be installed with either the 2311 mdl 1/3340 Series Compatibility (#8060) or the 2314/3340 Series Compatibility (#8070) on S/370 mdls 115 and 125. Cannot be installed with Two Channel Switch, Add'l (#8171) on the 3830 mdl 2. **Field Installation:** Yes.

REMOTE SWITCH ATTACHMENT (#6148). [Model A2 only] To attach the String Switch (#8150) to the configuration control panel of a S/370 mdl 158 MP or 168 MP. **Field Installation:** Yes.

ROTATIONAL POSITION SENSING (#6201, 6202). Permits channel disconnect during most of the rotational latency period and thus contributes to increased channel availability. #6201 — for mdl B1 ... #6202 — for mdl A2 or B2. If installed, it is desirable for efficient operation to have on every 3340 mdl A2, B2 or B1 in a string. **Limitations:** This feature may be installed but is not supported by the 4331 Processor 3340 Direct Attachment feature (#7851). **Field Installation:** Yes. **Prerequisite:** A block multiplexer channel on the system.

STRING SWITCH (#8150). [Model A2 only] To attach the 3340 to a second attachment. The two attachments may be on the same CPU or different CPUs and may be any two of the following: 3830 Storage Control mdl 2, 3880 Storage Control, the 3340 Direct Disk Attachment (DDA) on the 3115-2 or 3125-2, the 3330/3340 Series IFA (#4655) on the S/370 mdl 135, 135-3, 138, the 3345 Storage and Control Frame mdl 3, 4 or 5 or the ISC (#4660) for



3340 Direct Access Storage Facility (cont'd)

attachment to S/370 mdl 145, 145-3, 148, and the S/370 mdl 158 and 168 ISCs (#4650) ... see appropriate machines for additional requirements. Switching between the two attachments is under program control. The 3340 may also be dedicated to a single attachment with an enable/disable switch. **Field Installation:** Yes. **Specify:** To indicate the attachment to which this feature will be made, specify one of the following:

3830 mdl 2	#9591	3148 ISC	#9602
3135, 3135-3 IFA	9592	3158 ISC	9594
3138 IFA	9601	3168 ISC	9595
3345 mdls 3, 4, 5	9593	3115-2 DDA	9596
3145, 3145-3 ISC	9593	3125-2 DDA	9597
3880	9707		

In addition, String Switch (#9570) must be ordered on each 3340 mdl B1 or B2 which will be attached to the 3340 mdl A2 with String Switch (#8150).

Special Feature Prices:	MAC/ MRC	ETP/ MLC		Purchase	MMMC
		2 yr			
Fixed Head Feature					
for model A2 and B2	#4301	\$ 48	\$ 41	\$1,710	\$1.50
for model B1	4302	24	20	855	1.00
Remote Switch Attach	6148	NC	NC	NC	NC
Rotational Position Sensing					
for mdl B1	6201	20	17	684	.50
for mdl A2 or B2	6202	25	21	864	.50
String Switch	8150	220	187	7,200	12.00

IBM 3344 DIRECT ACCESS STORAGE

Purpose: Dual drive, large capacity, direct access storage for attachment via a 3340 mdl A2 to any virtual storage S/370 Processor, available on the 4341 Processor.

For possible use with System/3, see GSD manual.

Model B2 Two-drive disk storage unit which attaches to a 3340 mdl A2. It may be intermixed with 3340 model B units and/or 3344 mdl B2F units in any combination up to three B units per 3340 mdl A2.

Model B2F Two-drive disk storage unit with the same attachment capabilities as the 3344 mdl B2. It features Fixed Heads which provide 1,004,160 bytes of zero seek time storage on each drive.

Highlights: The 3344 features a large capacity, fixed storage medium. Each drive is equivalent in capacity and format to four logical 3348 mdl 70s. Each 3344 has two drives and requires eight logical device addresses. The Fixed Head storage capacity on the 3344 mdl B2F is associated with the first of the four logical volumes on each drive.

Cylinder concept - each drive has 2,784 logical cylinders with 12 tracks per cylinder. Maximum track capacity is 8,368 bytes providing up to 100,416 bytes per logical cylinder.

The 3344 mdl B2 provides 279,558,144 bytes of storage per drive.

The 3344 mdl B2F provides 279,558,144 bytes of storage per drive of which 1,004,160 bytes are accessible by fixed heads.

Data Rate - 885,000 bytes per second.

Access Time: Average seek time is 25 ms with a minimum of 10 ms and a maximum of 50 ms. For the 3344 mdl B2F logical cylinders 1 thru 10 of the first logical volume on each drive have a seek time of zero ms while all other cylinders retain the above seek timing. Rotation time is 20.2 ms and latency is 10.1 ms.

Read Only - a two position switch is provided for each drive. When the switch is in the "read only" position, the drive is protected from being written upon or erased.

Rotational Position Sensing - a standard feature on the 3344 which permits channel disconnect during most of the rotational latency period and thus contributes to increased channel availability. Requires a block multiplexer channel on the system. If RPS is used, it is advisable for efficient operation to also have it on every 3340 in a string.

Data Recovery (Plant Only) - should data in the field prove unrecoverable, data recovery assistance at the plant of manufacture will be provided.

Alternate Tracks: There are 96 alternate tracks per drive. The 3344 will be shipped from the plant with not more than five flagged tracks per drive. Therefore, a minimum of 91 alternate tracks per drive are available for customer use.

PREREQUISITES: A 3344 requires a 3340 mdl A2 and any virtual storage S/370 or 4341 Processor. with appropriate attachment and features. Control Store Extension (#2150) and Register Expansion (#8111) are prerequisite features on the 3830 mdl 2 and 3145, 3345, 3158, 3168 ISCs to attach 3344. On the 3115-2 and the 3125-2, 4K DASD Control Storage Extension (#4210) is required.

IMPORTANT: See the appropriate DASD storage control feature or machine to determine any additional prerequisite specify and/or special features to attach 3344.

Limitations: A 3340 string containing the 3344 may not be intermixed with a 3330 string on a 3135, 3135-3, 3138 IFA. 3340 strings containing the 3344 cannot be intermixed with 3330 or 3350 strings on a 3145, 3145-3, 3148, 3345, 3158, 3168 ISC or 3830 mdl 2.

Data written by S/3 cannot be retrieved by S/370 or 4341 Processor and vice versa.

Maximum: One 3340 string on a 3115-2/3125-2 DDA or on a 3135, 3135-3, 3138 IFA may contain 3344s.

Up to two 3340 strings on a 3830 mdl 2, 3145, 3145-3, 3148 or 3345 ISC, on each path of a 3158 or 3168 ISC or 3880 may contain 3344s.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with that of the unit to which the 3344 is attached.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] System Attachment: One of the following must be specified on each 3344 mdl B2/B2F: (For System/3 Specify Codes, see GSD manual.)

ATTACHMENT	SPECIFY	ATTACHMENT	SPECIFY
3830 mdl 2	#9581	S/370 mdl 168 ISC	#9585
S/370 mdl 135 IFA	9582	S/370 mdl 125 DDA	9586
S/370 mdl 135-3 IFA	9582	S/370 mdl 115 DDA	9587
S/370 mdl 138 IFA	9579	S/370 mdl 145 ISC	9588
3345 mdls 3, 4, 5	9583	S/370 mdl 145-3 ISC	9588
S/370 mdl 158 ISC	9584	S/370 mdl 148 ISC	9580
3880	9607		

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3344	B2	\$1,034†	\$880†	\$31,680	\$128†
	B2F	1,357†	1,155†	41,600	179†

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 60% Useful Life Category: 2 Per Call: 3
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model B2 to Model B2F \$12,610*

* Customer price quotations and customer acknowledgement letters for purchase MESs must state: "Installation of this model change involves removal of parts which become the property of IBM."

† MAC/MRC, ETP/MLC and MMMC prices effective 6/1/79.

3345 STORAGE AND CONTROL FRAME

3345 MODEL 3, 4 or 5 WITH ONE CHANNEL OR WITH TWO CHANNEL SWITCH (#8100)

Purpose: Additional processor storage and I/O control in a S/370 mdl 145.

- Model 1** Used with the 3145 mdl HG to provide 393,216 bytes of processor storage.
- Model 2** Used with the 3145 mdl I to provide 524,288 bytes of processor storage.
- Model 3** Used with the 3145 mdl H and below to provide for the attachment of 3330, 3340, 3344 or 3350 series disk storage via its standard Integrated Storage Control ... see 3330, 3333, 3340, 3344, 3350.
- Model 4** Used with the 3145 mdl HG to provide 393,216 bytes of processor storage and to provide for the attachment of 3330, 3340, 3344 or 3350 series disk storage via its standard Integrated Storage Control ... see 3330, 3333, 3340, 3344, 3350.
- Model 5** Used with the 3145 mdl I to provide 524,288 bytes of processor storage and to provide for the attachment of 3330, 3340, 3344 or 3350 series disk storage via its standard Integrated Storage Control ... see 3330, 3333, 3340, 3344, 3350.

- Highlights:**
- 607.5 nanosecond "store" cycle with 0-4 capability.
 - 540 nanosecond "fetch" cycle with 8 byte parallel access.
 - Error checking with correction is an integral part of mdls 1, 2, 4, 5.
 - Store and Fetch Protect are provided by the 3145.

PREREQUISITES: (1) Models 1 and 4 require a 3145 mdl HG ... models 2 and 5 require a 3145 mdl I ... model 3 is used with 3145 mdls H and below ... when 3345 mdl 3, 4 or 5 is to be installed with a 3145, #9851 is required on the 3145 ... for mdls 1, 2, 4 and 5, a 3046 Power Unit is required. (2) For models 3, 4 and 5, the standard Integrated Storage Control requires an available control unit position on a system channel. A block multiplexer channel and one unshared subchannel per logical device are required for support of block multiplexing and rotational position sensing. If this support is not required, attachment to a system selector channel is permitted. Word Buffer (#8810) is prerequisite on 3145 to support 3340, or if Selector Channel, 3rd (#6983) is installed on the 3145 ... see 3145.

Maximum: Only one 3345 can be attached to a 3145. For 3345 mdl 3, 4 or 5, see DASD Designation under "Specify" for maximum number of 3333/3340/3350s which can be attached to the standard Integrated Storage Control.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be the same as 3145 voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Cabling: #9080 for below floor, or #9081 for on the floor.

[4] DASD Configuration [Mdls 3, 4, 5 only]: The available combinations of storage devices which can be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required DASD Specify Features" are installed.

Based on the DASD, and the Special Features listed below being ordered for them, order the Required DASD Specify Feature(s). [Note that #9190 is 3340 Fixed Head Attachment for #9314 and #9315 and is not specified for #9317 or #9318.]

DASD Configuration	Required DASD Specify Features*							
	9313†	9314†	9314† 9190†	9315†	9315† 9190†	9317†	9318†	9318†
3333 Only								
One or two 3333s with associated 3330s	x	x						
Up to four 3333s with associated 3330s				xx				
String Switch (8150) on any 3333	x			x				
3340 Only								
One or two 3340 mdl A2s with associated mdl B1/B2s		x	x	x		x		
Up to four 3340 mdl A2s with associated mdl B1/B2s				xx		xx		
String Switch (8150) on any 3340 mdl A2		x		x		xx		
Fixed Head Feature (4301/4302) on any 3340			x		xx	xx		
3340/3344								
Up to four 3340 mdl A2s of which up to two may attach 3344s							x	x
String Switch (8150) on any 3340 mdl A2 and/or Fixed Head Feature on any 3340 (4301/4302)								x
3333/3340 (not 3344)								
3333s and 3340 mdl A2s (any combination of two, three, or four) each with associated drives				xx		xx		
String Switch (8150) on any 3333 or 3340 mdl A2					x		x	
Fixed Head Feature (4301/4302) on any 3340						xx		
3350 Only								
Up to four 3350 mdl A2s/A2Fs w associated mdl B2s/B2Fs, C2/C2F								xx
String Sw (8150) on any 3350 mdl A2/A2F,C2/C2F								x
3333/3340/3350 (not 3344)								
3333s, 3340 mdl A2s and 3350 mdl A2s/A2Fs (any combination of 2, 3 or 4) with associated drives								xx
String Sw (8150) on any 3333, 3340 mdl A2, or 3350 mdl A2/A2F,C2/C2F and/or Fixed Head Fea (4301/4302) on any 3340								x

† ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

* Any change to an installed DASD Configuration requires an MES ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.

** Control Store Extension (#2150) is prerequisite. With #9315, the ISC of the 3345 requires 32 contiguous device addresses regardless of the number of drives attached.

+ Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 mdl A2s on the first and third strings may attach up to three 3340 mdl B1, B2s, and/or 3344s in any combination. The 3340 mdl A2 on the second string may attach up to three 3340 mdl B1/B2s. The 3340 mdl A2 on the fourth string may attach one 3340 mdl B1 or B2.

++ Expanded Control Store (#2152) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 8 or 16 or 32 or 64 device addresses depending upon the DASD configuration installed and whether any 3350 drive is in 3330-1 compatibility mode.

Note: Customers who may elect to purchase Control Store Extension (#2150) and later upgrade to Expanded Control Store (#2152) should consider the purchase of Expanded Control Store (#2152) initially because this field upgrade requires replacement of Control Store Extension (#2150) and installation of Expanded Control Store (#2152). The prerequisite of Control Store Extension (#2150) can be satisfied by Expanded Control Store (#2152).

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
3345	1	\$ 3,285	\$104,950	\$ 96.50
	2	6,015	189,650	178.00
	3	1,090*	43,980	91.00
	4	4,285*	143,100	189.00
	5	6,995*	227,800	270.00

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Warranty: A Purchase Option: 50% Maintenance: D
 Metering: Base Unit (meter on 3145) Per Call: 3
 Useful Life Category: 2

* MAC/MRC price effective June 1, 1979.



3345 Storage and Control Frame (cont'd)

Model Changes: The following 3345 model upgrades are field installable:

Model 1 to model 2, 4 or 5 ... model 2 to model 5 ... model 4 to model 5. Model changes involving model 3 are not recommended for field installation.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	Model 2	Model 4	Model 5
Model 1	\$84,700	\$ 38,150	\$122,850
Model 2			38,150
Model 4			84,700

SPECIAL FEATURES

CONTROL STORE EXTENSION (#2150). [Models 3, 4, 5 only] Provides additional control store for microprogram use ... see DASD Configuration under "Specify" to determine when required. **Limitation:** Cannot be installed with Expanded Control Store (#2152). **Maximum:** One. **Field Installation:** Yes.

EXPANDED CONTROL STORE (#2152). [Models 3, 4, 5 only] Provides additional control storage for microprogram use on the ISC ... see DASD Configuration under "Specify" to determine when required. **Limitation:** Cannot be installed with Control Store Extension (#2150). **Maximum:** One. **Field Installation:** Yes.

REGISTER EXPANSION (#6111). [Mdl 3, 4, 5 only] Provides additional registers for microprogram use on the ISC ... see DASD configuration under "Specify" to determine when required. **Field Installation:** Yes. **Maximum:** One.

TWO CHANNEL SWITCH (#8100). [Models 3, 4, 5 only] To attach the standard Integrated Storage Control to a second channel ... the two channels may be on the same CPU or different CPUs. An available control unit position is required on each channel. Switching is under program control. The ISC can be dedicated to a single channel by means of an Enable/Disable switch. **Field Installation:** Yes. **Maximum:** One. **Prerequisites:** See item [2] under "Prerequisites."

Special Feature Prices:		MAC/ MRC	Purchase	MMMC
Control Store Extension	#2150*	\$262°	\$8,350	\$10.00
Expanded Control Store	2152*	421°	13,420	20.50
Register Expansion	6111*	24°	662	4.00
Two Channel Switch	8100	205	7,075	10.00

* Feature supplies ISC diskette.
° MAC/MRC price effective June 1, 1979.

3348 DATA MODULE (IRD Product)

Purpose: A new generation, removable and interchangeable Data Module for the 3340 Disk Drive family.

For use with System/3 or System/7, see GSD manual.

Models: Three are available in two different capacities:

- 3348 Model 35 - 34,944,768 bytes
- 3348 Model 70 - 69,889,536 bytes.
- 3348 Model 70F - 69,889,536 bytes of which 502,080 are accessible by fixed heads.

Highlights:

Data Module Concept - the 3348 Data Module utilizes a new concept in removable direct access storage devices. The Data Module, within a sealed cartridge, contains the disks, the spindle,

the read/write heads and the access arms. The access arms and heads are not part of the drive as in previous disk pack/disk drive interfaces. The sealed module design protects the disk surfaces by reducing outside contamination. Multiple capacity options on each drive become possible due to the modularity provided by this unique design. In addition, the mdl 70F contains fixed heads which provide low cost, fixed head capability for the 3340 user. The user may place selected components of IBM software as well as his own programs in the fixed head area to increase device performance. The 3348 mdl 70F requires that the Fixed Head Feature be installed on the 3340.

Removable - can be installed and removed from the 3340 by the operator.

Interchangeable - the mdl 35 or the mdl 70 may operate on any drive and are interchangeable between drives, including those with the Fixed Head Feature installed. The mdl 70F, however, requires that #4301 or #4302 be installed on the drive.

Auto-loading - Data Modules are automatically loaded after the Data Module is placed in the drive, cover is closed and a switch is turned on. Start-up time is less than 20 seconds.

Flag-Free - Data Modules are shipped from the plant flag-free. If within 90 days after receipt the customer is required to assign an alternate track (using DOS/VS System utilities), he may return the Data Module to IBM and it will be repaired at no cost to the customer.

Capacity Upgrade - (Plant only) - the customer-owned model 35 may be capacity upgraded to a model 70. Data modules must be returned to the plant of manufacture for the upgrade service. Downgrading is not available. Recorded data will not be recoverable. Upgrade of either the model 35 or 70 to the model 70F is not available.

Dimensions	Model 35	Model 70	Model 70F
Height	8"	8"	8"
Width	16"	16"	16"
Maximum Length	18	18	18
Shipping Weight (lbs)	21	23	24

Covers are sealed at the plant and are unbreakable and nonflammable. A large handle is provided for ease of installation, removal and transportation. The Data Module has an aperture that is opened (or closed) automatically by the drive during loading (or unloading). The Data Module is then connected to the drive for power and communications.

A CE cylinder is assigned to facilitate maintenance of the 3340.

Data Recovery (Plant only) - should data in the field, for any reason, prove unrecoverable, a method for data recovery assistance at the plant of manufacture will be provided.

Initialization - the Data Module will be initialized at the plant. Home addresses and record zero will be written for each track.

UPGRADE PRICE FOR PURCHASED DATA MODULES (Plant only)

Model 35 to model 70 **

3348 Data Module Repair Service (Plant only)

Mdl 35 Mdl 70 Mdl 70F

Replace one or more damaged disks (including servo disk) and heads, clean and lubricate, and retest to new data module performance specifications. (Does not include covers.)

Replace one or more damaged heads (including fixed head assembly on the 70F), clean and lubricate, and retest to new data module performance specifications.

Clean and lubricate and retest only. (this price will be charged if no disk/heads require replacement.)

IBM 3350 DIRECT ACCESS STORAGE

Purpose: High speed, large capacity, direct access storage for attachment to any virtual storage S/370 Processor (except 3115 or 3125), or a 4341 Processor.

Model A2 Two-drive disk storage and associated control for attachment to 3145 mdls GE, GFD, H, HG or I via the 3345 mdl 3, 4 or 5, to the 3145 mdls H2, HG2, I2, IH2, J2, JI2 or K2 via the ISC (#4660), to the 3145-3, and the 3148 via the ISC (#4660), to the 3158, 3158-3, 3168 or 3168-3 via the ISC (#4650), to the 3830 mdl 2 or 3, and the 3880. It provides logic and power for the attachment of up to three 3350 mdl B2/B2F units or up to two mdl B2/B2F units and one C2/C2F unit.

Model A2F Two-drive disk storage and associated control with the same attachment capabilities as the model A2. It features Fixed Heads which provide up to 1,144,140 bytes of zero seek time storage on each drive in lieu of the same capacity under the moving heads.

Model B2 Two-drive disk storage unit. Up to three 3350 mdl B2/B2Fs can be attached to a 3350 mdl A2/A2F.

Model B2F Two-drive disk storage unit with the same attachment capabilities as the model B2. It features Fixed Heads which provide up to 1,144,140 bytes of zero seek time storage in each drive in lieu of the same capacity under the moving heads.

Model C2 Two-drive disk storage and associated control. Provides an alternate controller function within a 3350 string. The model C2 functions as a mdl A2 or B2 depending upon the setting of a manual switch on the unit. A 3350 string containing a model C unit requires a model A unit with Primary Controller Adapter (#1320) and may include 0, 1 or 2 model B2/B2F units.

Model C2F Two-drive disk storage and associated control with the same attachment capabilities as the model C2. It features Fixed Heads which provide up to 1,144,140 bytes of zero seek time storage in each drive in lieu of the same capacity under the moving heads.

Highlights: The 3350 features high data rate, fast access, multiple formats and low cost per byte. It employs a fixed storage medium.

Selective Format: Drive format may be 3330 mdl 1 or 3330 mdl 11 compatibility mode or 3350 native mode. Format is specified by individual drive. Format changes may be made by FE in the field. In 3330 mdl 1 or mdl 11 compatibility mode the Fixed Head storage capacity on the models A2F, B2F and C2F is 742,710 bytes per drive. In 3330 mdl 1 compatibility mode this Fixed Head storage capacity is associated with the first of the two logical 3330 mdl 1 volumes on each 3350 drive. In 3350 native mode Fixed Head storage capacity on the models A2F, B2F and C2F is 1,144,140 bytes per drive.

	3330 mdl 1 Mode	3330 mdl 11 Mode	3350 Native Mode
Bytes per Track	13,030	13,030	19,069
Tracks per Logical Cylinder	19	19	30
Logical Cylinders per Drive 2 x 404		808	555
Approx capacity/drive (MB) 2 x 100		200	317.5

Data Rate: 1,198,000 bytes per second.

Access Time: Average seek time is 25 ms with a minimum of 10 ms and a maximum of 50 ms. Average rotational delay is 8.4 ms. For 3350 mdls A2F, B2F C2F cylinders 1 and 2 (3350 Native Mode), or cylinders 1 thru 3 (3330 mdl 11 compatibility mode), or cylinders 1 thru 3 of the first of the two logical volumes on a drive (3330 mdl 1 compatibility mode), have a seek time of zero ms. All other cylinders retain the above seek timing.

Error Correction: Provides capability of correcting single data error bursts of up to four bits span as well as detecting all single error bursts of up to ten bits span.

Write Format Release: Frees the subsystem while the drive erases from the end of a formatted write record to the end of the track.

Rotational Position Sensing: Permits channel disconnect during period of rotational latency, thereby providing greater channel availability ... requires one unshared subchannel on a block multiplexer channel for each logical device.

Command Retry: Enables the storage control to recover from certain subsystem errors without recourse to system error recovery procedures.

Read Only: A two position switch is provided for each drive. When the switch is in the "read only" position, the drive is protected from being written upon or erased.

Data Recovery (Plant Only): Should data in the field prove unrecoverable, data recovery assistance at the plant of manufacture will be provided.

Flag Free: The 3350 will be shipped flag free.

PREREQUISITES: A 3350 DAS requires -- a 3350 mdl A2 or A2F; any virtual storage S/370 Processor with appropriate attachment and features (except 3115 or 3125), or a 4341 Processor via a 3830 Storage Control mdl 2 or 3, or a 3880 Storage Control. A 3145 requires Word Buffer (#8810) to attach 3350s. Expanded Control Store (#2151), Control Store Extension (#2150), and Register Expansion (#6111) are required on the 3830 mdl 2 or 3158, 3168 ISCs to attach 3350. Expanded Control Store (#2152) and Register Expansion (#6111) are required on the 3145, 3145-3, 3148 or 3345 ISCs, or 3830 mdl 3 to attach 3350s.

IMPORTANT: See the appropriate DASD storage control feature or machine to determine any additional prerequisite specify and/or special features to attach a 3350.

Maximum: See 3145, 3158, 3168, 3345 ISC, 3830 mdl 2 or 3, or 3880 "Machines" pages.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Format:	First Drive	Second Drive
3330 mdl 1 Compatibility Mode	#9731	#9732
3330 mdl 11 Compatibility Mode	9741	9742
3350 Native Mode	9751	9752

[4] Control Attachment: #9608 for attachment to a 3880, or #9609 for attachment to any of the following ... 3345 mdl 3, 4 or 5, S/370 mdl 144, 145-3 or 148 ISC, S/370 mdl 158, 158-3, 168 or 168-3 ISC, 3830 mdl 2 or 3.

PRICES:	Mdl	MAC/ MRC†	ETP/ MLC 2 yr †	Purchase	MMMC†
3350	A2	1,304	\$1,100	\$40,000	\$170
	A2F	1,627	1,385	49,920	221
	B2	1,034	880	31,680	128
	B2F	1,357	1,155	41,600	179
	C2	1,351	1,150	41,380	179
	C2F	1,674	1,425	51,300	230

Plan Offering: Plan B Purchase Option: 60% Machine Group: A
Warranty: B Useful Life Category: 2 Per Call: 3
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Model changes between 3350 mdl A and mdl B units, or mdl C and mdl B units are available at time of manufacture only. Model changes between 3350 mdl A and mdl C units are not recommended for field installation. Model changes between A2 and A2F units, or B2 and B2F units, or C2 and C2F units are field installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

Model A2 to Model A2F \$12,610*
Model B2 to Model B2F \$12,610*
Model C2 to Model C2F \$12,610*

* Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model change involves the removal of parts which become the property of IBM."

† MAC/MRC, ETP/MLC and MMMC prices effective 6/1/79.



3350 Direct Access Storage (cont'd)

SPECIAL FEATURES

PRIMARY CONTROLLER ADAPTER (#1320). [Mdl's A2 and A2F only] Permits selection/deselection of the controller of the A2/A2F unit as the online controller via a manual switch on the C2/C2F unit in the string. **Maximum:** One per A2/A2F unit. **Field Installation:** Yes. **Corequisite:** One C2 or C2F unit in the string.

REMOTE SWITCH ATTACHMENT (#6148). [Mdl's A2, A2F, C2 and C2F only] To attach the String Switch (#8150) to the configuration control panel of a S/370 mdl 158MP or 168MP. **Field Installation:** Yes.

STRING SWITCH (#8150). [Mdl's A2, A2F, C2 and C2F only] To link the 3350 to a second attachment. The two attachments may be on the same CPU or different CPUs and may be any two of the following: 3830 Storage Control mdl 2 or 3, 3880 Storage Control, the 3345 Storage and Control Frame mdl 3, 4 or 5, the ISC (#4660) on the S/370 mdl 145, 145-3 or 148, or the ISC (#4650) on the S/370 mdl 158, 158-3, 168 or 168-3. See appropriate machines for additional requirements. Switching between the two attachments is under program control. The 3350 may also be dedicated to a single attachment with an enable/disable switch. *Specify: #9608 for attachment to a 3880, or #9609 for attachment to any of the following ... 3345 mdl 3, 4 or 5, the ISC (#4660) on a S/370 mdl 145, 145-3 or 148, the ISC (#4650) on a S/370 mdl 158, 158-3, 168, 168-3, or a 3830 mdl 2 or 3.* **Field Installation:** Yes.

Special Feature Prices:		ETP/		Purchase	MMMC
		MAC/ MRC	MLC 2 yr		
Primary Controller Adptr	#1320	\$ 9*	\$ 8*	\$ 275	\$1.50*
Remote Switch Attach	6148	NC	NC	NC	NC
String Switch	8150	162*	138*	4,610	9.00*

IBM 3360 PROCESSOR STORAGE

[No longer available]

Purpose: Processor storage for a S/370 mdl 155 or 165.

- Model 1** 262,144 bytes ... one used in a S/370 mdl H155 ... one used with a 3360 mdl 3 in a S/370 mdl IH155.
- Model 2** 393,216 bytes ... one used in a S/370 mdl HG155.
- Model 3** 524,288 bytes ... one used in a S/370 mdl I155 ... one used with a 3360 mdl 1 in a S/370 mdl IH155 ... two used in a S/370 mdl J155 ... three used in a S/370 mdl JI155 ... four in a S/370 mdl K155.
- Model 4** 262,144 bytes ... two used in a S/370 mdl I165 ... two used with two 3360 mdl 5s in a S/370 mdl JI165.
- Model 5** 524,288 bytes ... two used in a S/370 mdl J165 ... two used with two 3360 mdl 4s in a S/370 mdl JI165 ... four used in a S/370 mdl K165 ... six used in a S/370 mdl KJ165.

Model Changes: Not recommended for field installation.

Highlights: Models 1, 2 and 3 have a 2.1-microsecond storage cycle with a 16-byte parallel access.

Models 4 and 5 have a 2.0-microsecond storage cycle with a 16-byte parallel access. Storage words are 4-way interleaved in the S/370 mdl 165 to improve sequential access.

On all models Error Checking and Correction as well as Store and Fetch Protect are provided by the processing unit.

PREREQUISITE: An appropriate 3155 or 3165. When ordering 3360s to change the size of a S/370 mdl 155 or 165, a companion order modifying the model of the 3155 or 3165 must also be submitted.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	3360 1	\$ 3,060	\$139,300	\$187
	2	4,590	209,000	279
	3	6,120	279,700	372
	4	3,060	139,300	187
	5	6,120	279,700	372

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Purchase Option: 65% Machine Group: D
Metering: Mdl's 1, 2, 3 - Base Unit (meter on 3155) Per Call: 3
Mdl's 4, 5 - Assignable Unit
Warranty: A Useful Life Category: 1

* MAC/MRC, ETP/MLC and MMMC prices effective 6/1/79.

IBM 3370 DIRECT ACCESS STORAGE

Purpose: High speed, large capacity, fixed media, direct access storage for attachment to a 4331 or 4341 Processor.

Model A1 Single drive disk storage with two actuators and associated control for attachment to a 4331 or 4341 Processor. It provides logic for the attachment of up to three 3370 model B1s.

Model B1 Single drive disk storage with two actuators. Up to three 3370 model B1s can be attached to a 3370 model A1.

Model Changes: Available at time of manufacture only.

Highlights

The 3370 features a high data rate, fast access, fixed block format, and low cost per byte. It employs a fixed, sealed Head/Disk Assembly (HDA) as the storage medium. The HDA is a field replaceable unit. Two access arms per spindle, each separately addressable with overlapped operation ... locate-locate/read/write. Each arm accesses one-half the data. Reduced power and space requirements. Fixed block architecture allows the specification of DASD space in groups of blocks, making space definition independent of tracks and cylinders.

Fixed Block Format

Bytes per block	512
Blocks per actuator	558,000
Bytes per actuator (megabytes)	285.6
Bytes per spindle (megabytes)	571.3

Blocks are separately addressable and jointly form a contiguous address space.

Data Rate -- 1.859 ± 3% megabytes per second.

Access Time

Seek (Arm Motion)	
Minimum	5 ms
Average	20 ms
Maximum	40 ms
Latency	10.1 ms

Error Correction: Provides the capability of correcting single data error bursts of up to nine bits span as well as detecting all single error bursts of up to sixteen bits span.

Automatic Position Sensing: Fixed Block Architecture provides for relative block addressing ... each block separately addressable ... channel automatic disconnect during period of rotational latency providing greater channel availability ... requires one unshared subchannel on a block multiplexer channel for each logical address.

Command Retry: Enables the storage control to recover from certain subsystem errors without recourse to system error recovery procedures.

Write Protect Function: A switch for each Drive Address provides the means to protect data from being rewritten or erased. When the read/write switch is in the read-only position, any write command is rejected. The switch state can be changed only when the device is not selected.

HDA Data Recovery: [Plant only] Should data in the field prove unrecoverable, data recovery assistance at the plant of manufacture will be provided.

Prerequisites

For a 4331 Processor -- a 3370 mdl A1 requires a DASD Adapter (#3201) on the 4331.

For a 4341 Processor -- a 3370 mdl A1 requires a 3880 Storage Control mdl 1 connected to a 2.0 megabyte block multiplexer channel on the 4341.

A 3370 mdl B1 requires a 3370 mdl A1.

Electrical power is required during non-operating periods except when maintenance is being performed. Each 3370 contains internal environmental control circuitry which remains active when machine power is turned off. Continued or repeated failure to provide power to this circuitry could cause machine malfunction and could result in possible loss of data.

Maximum: See 3880 Storage Control or 4331 Processor.

Bibliography: GA26-1657

SPECIFY

- **Voltage** (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208V, or #9915 for 240V Note: 20 VAC is compatible with 230 VAC systems.
- **Color:** #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

Prices:	Mdl	MRC	MLC 2 Yr	Purchase	MMMC/ AMMCR
3370	A1	\$1,058	\$900	\$35,100	\$120
	B1	705	600	23,400	90

Plan Offering: Plan D Maintenance: D Per Call: 3
Purchase Option: 60% Warranty: B Useful Life Category: 2
Termination Charge Months: 5 Termination Charge Percent: 25
Upper Limit Percent: 5%
Initial Period of Maintenance Service: 3 mos.

SPECIAL FEATURES

STRING SWITCH (#8150). [Model A1 only ... for use with 3880 Storage Control mdl 1 only] To attach the 3370 model A1 to a second Storage Director. The two Storage Directors may be on the same processor or different processors. Switching between the two Storage Directors is under program control. The 3370 may also be dedicated to a single attachment with an enable/disable switch. **Maximum: One. Field Installation: Yes.**

Special Feature Prices:	MRC	MLC 2 Yr	Purchase	MMMC/ AMMCR
String Switch	#8150 \$118	\$100	\$3,900	\$1.50

[reverse side is blank]

**3410 MAGNETIC TAPE UNIT
3411 MAGNETIC TAPE UNIT AND CONTROL**

Purpose: Magnetic tape units and controls for a 3790 Communication System, S/360 mdls 22, 25, 30, 40, 50, S/370 mdls 115 thru 158, a 3031 Processor, or a 4331 or 4341 Processor ... the 3410 mdl 1 can be used with a 3881 Optical Mark Reader mdl 2 or a 3886 Optical Character Reader mdl 2 ... the 3411 and 3410 mdl 3s can be used with a 3800 Printing Subsystem ... the 3411 mdl 1 can be used with a 3776 Communication Terminal mdl 3 or 4, or a 3777 Communication Terminal mdl 3.

NOTE: For possible use with System/3, see GSD Manual.

Models: Data rates in 8-bit bytes per second (1600 bpi).

	3410	3411
Model 1	20,000	20,000
Model 2	40,000	40,000
Model 3	80,000	80,000

Highlights: The 3410 is a single tape unit controlled by a 3411. The 3411 is a single channel control unit with one tape drive.

- Efficient compact space saving design.
- Dual Density feature ... allows processing of data recorded at 1600 bpi PE or 800 bpi NRZI.
- Seven Track feature ... tape written in seven-track format compatible with tapes written at 200, 556, 800 bpi by 729/7330/7335 and 2401/2402/2403/2404/2415/3420 tape drives equipped with 7-track read/write heads. **Note:** 7-track tapes cannot be used with a 3776 mdl 3 or 4, or a 3777 mdl 3.
- Radial attachment of tape units permits off-line maintenance.
- Simplified tape threading path.

Checking -- during write operations, both parity and signal amplitude are checked. (When used with a 3881 Optical Mark Reader, both are checked in 800 bpi NRZI ... signal amplitudes only in 1600 bpi.) During read operations, parity is checked.

Error Correction -- in 1600 bpi PE recording format single track error correction in flight takes place. For 9-track, 800 bpi NRZI, track in error (T.I.E.) is provided, (not applicable when used with a 3881 Optical Mark Reader).

Functions: The following table indicates feature numbers for corresponding functions:

Subsystem Function	Feature Name	3411 Control Unit	3410* Tape Unit (includes tape unit on 3411)
1600 bpi 9-track only	Single Density	Standard	#3211
1600 bpi PE/800 bpi NRZI 9-track	Dual Density	#9150	#3211 or #3221
1600 bpi PE/200-556-800 bpi NRZI 7-track	Seven Track	#9160	#3211 or #6550

* Tape units must all be the same model as 3411.

Characteristics	Model 1	Model 2	Model 3
Data Rate (kb/sec)			
at 1600 bpi (P.E.)	20	40	80
at 800 bpi (NRZI)	10	20	40
at 556 bpi	6.9	13.9	27.8
at 200 bpi	2.5	5.0	10.0
Recording Density (bpi)	1600/800/556/200 (all models)		
Tape Speed (ips)	12.5	25	50
Nominal IBG (inch) -- 9-track	.6	.6	.6
Nominal IBG (inch) -- 7-track	.75	.75	.75
Nominal IBG Time (ms) -- 9-track	48	24	12
Nominal IBG Time (ms) -- 7-track	60	30	15
Nominal Rd/Wr Access Time (ms)	15	12	6
Rewind Time Full Reel (min)	3	3	2

Maximums: Interconnected 3410s and 3411s must be of the same model ... models cannot be intermixed. The maximum number of tape units (3410s) per 3411 are:

Model 1 -- up to three 3410 mdl 1s ... a total of 4 drives.

Model 2 -- up to five 3410 mdl 2s ... a total of 6 drives.

Model 3 -- up to five 3410 mdl 3s ... a total of 6 drives.

LIMITATION: A maximum of one 3410 mdl 1 can be attached to a 3881 or 3886.

PREREQUISITES: Each 3411 requires the following:

For S/370 mdl 115, 125 -- a 3411 Magnetic Tape Adapter (#4675) on the 3115 or 3125 and S/370 mdl 115/125 Attachment (#7361) on the 3411 except with 3115 mdl HG2, 3125 mdl HG2 and I2. When attached to 3115 mdl HG2, or 3125 mdl HG2

or I2, RPQ is required on the 3411 ... see "Special Features."

For S/360 or S/370 mdl 135 and up, and all 4300 Processors -- a control unit position on a system channel, plus S/360/370 Attachment (#7360) on the 3411 ... see "Special Features."

S/360 mdl 25 -- Selector Channel (special feature) ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), or Selector Channels (special features, except one is standard on 2022) ... see 2022, 2030, 2040, 2050.

S/370 mdl 135 -- multiplexer channel (standard), Selector or Block Multiplexer Channels (special features) ... see 3135. **NOT** supported on byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or Selector Channel.

S/370 mdl 135-3 -- byte multiplexer channel (standard), block multiplexer channels (special features) ... see 3135-3. **NOT** supported on byte multiplexer channel for concurrent operation of Integrated File Adapter, Integrated Communications Adapter, or Block Multiplexer Channel.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138. **NOT** supported on byte multiplexer channel for concurrent operation of Integrated File Adapter, Integrated Communications Adapter, or Block Multiplexer Channel.

S/370 mdl 145 -- multiplexer channel (standard), Selector Channels (one is standard), or Block Multiplexer Channel (special feature) ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- block multiplexer channel (first two are standard) ... see 3155, 3158.

3031 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031.

4331 Processor -- byte multiplexer channel (optional) ... see 4331 byte multiplexer channel for restrictions. Block multiplexer channel (optional) ... see 4331.

4341 Processor -- block multiplexer channels (2 are standard) ... see 4341.

3776 Communication Terminal mdl 3 or 4, or 3777 Communication Terminal mdl 3 -- 3411 Model 1 Attachment (#7801) on the terminal ... see "Special Features" under 3776 or 3777. The 3411 itself requires S/3-3770/3790 Communication System Attachment (#7003) ... see "Special Features" below.

3790 Communication System -- a Magnetic Tape Attachment feature (#7840) on the 3791 Controller. The 3411 requires a 3790 Attachment feature (#7003).

3800 Printing Subsystem -- Tape-to-Printing, Subsystem Feature (#7810) on the 3800 ... see "Special Features" under 3800. **Note:** A control unit position is not required.

Each 3410 requires an appropriate model of the 3411, except when a 3410 mdl 1 is attached to a 3881 or 3886.

Magnetic Tape: The following tapes and reels can be used -- IBM Series 500, IBM Heavy Duty, IBM Dynexcel, or competitive formulations which meet the tape and reel criteria in "Tape Specifications", GA32-0006. **NOTE:** IBM tapes other than those above do not provide adequate reliability and should not be used.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001, 3881 -- GA21-9127. Also IBM 3410/3411 Component Summary, GA32-0015.

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V. If used with a 3881 Optical Mark Reader, a 3886 Optical Character Reader, or a 3800 Printing Subsystem, voltage must be consistent.

[2] Dual Density, Control (3411 only): #9150. Permits attachment of 3410s equipped with Dual Density, Tape Unit (#3221) and installation of Dual Density, Tape Unit (#3221) on the 3411 itself. 3410s equipped with Single Density, Tape Unit (#3211) can also be attached. **Limitation:** Cannot be installed on same 3411 with Seven Track, Control (#9160). **Field Installation:** Yes.

[3] Seven Track, Control (3411 only): #9160. Permits attachment of 3410s equipped with Seven Track, Tape Unit (#6550) and installation of Seven Track, Tape Unit (#6550) on the 3411 itself. 3410s equipped with Single Density, Tape Unit (#3211) can also be attached. #9160 includes the translator function which, when used, causes 8-bit bytes from the I/O interface to be written on tape as 6-bit BCD characters and 6-bit charac-



3410/3411 Magnetic Tape Unit and Control (cont'd)

ters read from tape to be translated into their EBCDIC equivalents. The Data Conversion function, also included, allows reading and writing of 8-bit bytes on 7-track tape by converting 4 tape characters to 3 storage bytes and vice versa. **Limitations:** Cannot be installed with Dual Density, Control (#9150). Cannot be used with a 3776 mdl 3 or 4, or a 3777 mdl 3. **Field Installation:** Yes.

- [4] Additional Tape Units (3411 only): #9001 ... required if the number of tape drives is to exceed four (one 3411 plus three 3410s). **Field Installation:** Yes.
- [5] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- [6] Tape Reels: If any color other than gray is desired, specify #9051 for red, #9053 for blue, or #9054 for white.
- [7] Density Formats: The 3410/3411 subsystem can operate in three density formats ... 1600 bpi PE, single density ... or 1600/800 bpi, dual density ... or 200/556/800 bpi, seven track. With the exception of single density, which is standard on the control unit of the 3411, a feature number for the format desired must be specified for each tape unit and the control unit ... see "Special Features" for limitations. Dual Density, Control (#9150) is required on the 3411 for Dual Density, Tape Unit (#3221) on the 3411 and attached 3410s ... see specify [2] above. Seven Track, Control (#9160) is required on the 3411 for Seven Track, Tape Unit (#6550) on the 3411 and attached 3410s ... see specify [3] above.
- [8] System Attachments: S/370 Mdl 115/125 Attachment (#7361) is required for attachment to a S/370 mdl 115 or 125 except with 3115 mdl HG2, 3125 mdl HG2 and I2. When attached to 3115 mdl HG2, 3125 mdl HG2 or I2, RPQ is required on the 3411 ... see "Special Features" ... S/360/370 Attachment (#7360) is required for attachment to a S/360 or S/370 mdls 135, 135-3, 138, 145, 145-3, 148, 155, 158, a 3031 Processor, or any 4300 Processor. System/3-3770/3790 Communication System Attachment (#7003) is required for attachment to a 3790 system. System 3 - 3770/3790 Communication System Attachment (#7003) is required for attachment to a 3776 Communication Terminal mdl 3 or 4 or to a 3777 Communication Terminal mdl 3.

PRICES:	Mdl	-- FTP --			Purchase	MMMC
		MAC/MRC	MLC 1 yr*	MLC 2 yr		
	3410					
	1	\$206	\$190	\$173	\$ 5,655	\$ 61.50
	2	274	252	230	7,560	68.00
	3	342	315	287	9,360	75.00
	3411					
	1	454	418	381	12,460	95.00
	2	578	532	486	15,770	102.00
	3	701	645	589	19,220	109.00

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Purchase Option: 55% Maintenance: C
 Metering: 3410 (all mdls -- I/O Unit Online) ... 3410 mdl 1 when used with a 3881 mdl 2 -- I/O Unit (Offline).
 3411 -- Assignable Unit
 Warranty: B Useful Life Category: 2 Per Call: 3
 Model/Feature Additional Charge in lieu of AU Charge: 10%
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (There are no additional installation charges)

3410 Mdl 1 to Mdl 2	\$2,385	3411 Mdl 1 to Mdl 2	\$4,140
Mdl 1 to Mdl 3	4,635	Mdl 1 to Mdl 3	8,460
Mdl 2 to Mdl 3	4,635	Mdl 2 to Mdl 3	8,460

SPECIAL FEATURES

SINGLE DENSITY, TAPE UNIT (#3211). [3410, 3411 any mdl] Permits the 3410 or the tape unit on the 3411 to operate at 1600 bpi PE only. **Limitation:** Cannot be installed with Dual Density, Tape Unit (#3221) or Seven Track, Tape Unit (#6550). **Field Installation:** Yes. **Prerequisite:** If installed on the 3886 Optical Character Reader, Single Density Tape Adapter (#6490) on the 3886.

DUAL DENSITY, TAPE UNIT (#3221). [3410, 3411 any mdl] Permits the 3410 or the tape unit on the 3411 to operate at 800 bpi as well as 1600 bpi. **Limitation:** Cannot be installed with Single Density, Tape Unit (#3211) or Seven Track, Tape Unit (#6550). **Field Installation:** Yes. **Prerequisites:** Dual Density, Control (#9150) on the 3411 ... see "Specify," or Dual Density (#3550) on the 3881 Optical Mark Reader, or Dual Density, Tape Adapter (#6485) on the 3886 Optical Character Reader.

SEVEN TRACK, TAPE UNIT (#6550). [3410, 3411 any mdl]

Permits the 3410 or the tape unit on the 3411 to operate at 200, 556 or 800 bpi NRZI in the seven track format compatible with 729, 7330, 7335 and 2401, 2402, 2403, 2404, 2415, 3420 tape units equipped with seven-track read/write heads. Tape units with this feature will only read or write 7-track tape. **Limitations:** Cannot be installed with Single Density, Tape Unit (#3211), or Dual Density, Tape Unit (#3221). Cannot be used with a 3776 mdl 3 or 4 or a 3777 mdl 3. **Field Installation:** Yes. **Prerequisite:** Seven Track, Control (#9160) on the 3411.

SYSTEM/3-3770/3790 COMMUNICATION SYSTEM ATTACHMENT (#7003). [3411 mdl 1 only] To attach a 3411 mdl 1 with up to three 3410 mdl 1s to a 3791 Controller, or to attach one 3411 mdl 1 to a 3776 Communication Terminal mdl 3 or 4, or a 3777 Communication Terminal mdl 3. **Prerequisites:** Magnetic Tape Attachment (#7804) on the 3791, or 3411 Magnetic Tape Unit and Control Mdl 1 Attachment (#7801) on the 3776 mdl 3 or 4, or 3777 mdl 3. **Maximum:** 1. **Field Installation:** Yes. **Limitations:** Cannot be installed with S/360/370 Attachment (#7360), or S/370 Mdl 115/125 Attachment (#7361). For use with System 3, see GSD sales manual.

S/360/370 ATTACHMENT (#7360). [3411 mdl 1, 2, 3] To attach the 3411 to a S/360 mdl 22, 25, 30, 40, 50 or a S/370 mdl 135, 135-3, 138, 145, 145-3, 148, 155, 158, a 3031 Processor, or any 4300 Processor. [3411 mdl 3] To attach the 3411 mdl 3 to a 3800 Printing Subsystem. Up to eight control units may be attached to the 3800 provided that power sequencing and control connection for all other than one are provided by the system. **Limitation:** Cannot be installed with System/3-3790 Communication System Attachment (#7003) or S/370 Mdl 115/125 Attachment (#7361 or RPQ). **Field Installation:** Yes.

S/370 Mdl 115/125 ATTACHMENT (#7361). [3411 mdl 1, 2, 3] To attach the 3411 to a S/370 mdl 115 or 125, except to 3115 mdl HG2, 3125 mdl HG2 or I2. When attached to 3115 mdl HG2, 3125 mdl HG2 or I2, RPQ 870061 is required. **Limitation:** Cannot be installed with System/3-3790 Communication System Attachment (#7003) or S/360/370 Attachment (#7360 or RPQ 870061). **Field Installation:** Yes. **Prerequisite:** 3411 Magnetic Tape Adapter (#4675) on the 3115 or 3125 Processing Unit.

Special Feature Prices:	-- FTP --			Purchase	MMMC	
	MAC/MRC	MLC 1 yr*	MLC 2 yr			
Single Density, Tape Unit	#3211	\$ 60	\$ 55	\$ 50	\$1,835	\$ 9.50
Dual Density, Tape Unit	3221	88	81	74	2,645	36.50
Seven Track, Tape Unit	6550	88	81	74	2,645	17.00
S/3-3770/3790						
Communication Sys Attach	7003	83	76	70	2,315	3.50
S/360/370 Attachment to mdls						
135,145,155,158 or 3031	7360	166	153	139	4,625	20.00
S/370 Mdl 115/125 Attach	7361	110	101	92	3,080	5.00

3420 MAGNETIC TAPE UNIT - Models 3, 5, 7

Purpose: Magnetic tape unit for S/360 and S/370.

Model 3 120,000 eight-bit bytes/second ... for use with S/360 mdls 22, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 91, 195, , with all S/370 Processors, or with a 3800 Printing Subsystem.

Model 5 200,000 eight-bit bytes/second ... for use with S/360 mdls 22, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 91, 195, , with all S/370 Processors, or with a 3800 Printing Subsystem.

Model 7 320,000 eight-bit bytes/second ... for use with S/360 mdls 50, 65, 67 (in 65 mode), 75, 85, 91, 195, with all S/370 Processors except 3115 and 3125, or with a 3800 Printing Subsystem.

Highlights: Radial attachment of tape drives to the control unit via a switch located in the control unit, permitting off-line service of individual tape units without disturbing the subsystem. 24-line multiplex interface provides advanced diagnostic capability. MST circuitry reduces card count while increasing functions: expanded sense data, better diagnostic capability, unique device identification, EC level and feature identification. Reads and writes IBM Series/500, Dynexcel or Heavy Duty half-inch magnetic tape on 10-1/2", 8-1/2" or minireels. **Limitations:** The following half-inch tapes can be used: IBM Heavy Duty, IBM Dynexcel, IBM Series/500, or competitive formulations which meet the specifications described in SRL GA32-0006. IBM Mylar*** and IBM Acetate tapes should not be used with 3420 tape units.

* FTP is 12-23 months.

*** "Mylar" is a trademark of E. I. DuPont de Nemours & Co., Inc. "IBM Mylar" is a brand of magnetic tape which includes a Mylar polyester substrate and which was previously marketed by IBM.



3420 Magnetic Tape Unit - Models 3,5,7 (cont'd)

Automatic threading and Cartridge Loading -- threading is automatic with or without the wraparound cartridge; automatic retry (with cartridge only) in case of load failure, stopping on the leader to prevent damage to the recorded surface. With the wraparound cartridge, tape is not exposed to contamination or damage.

Nine Track 1600 bpi Phase Encoding Operation -- data is recorded parallel by bit, serial by byte at 1600 bytes/inch, phase encoded, in nine tracks across the width of the tape. The data format uses eight of the nine bits for data; the ninth bit is a parity bit. Data is recorded in odd parity. The eight bits of one byte can represent an alphabetic character, zoned decimal digit, two decimal digits (packed), a special character, or eight binary bits. The recording format is compatible with the 1600 bpi PE recording of tape units 2401, 2402, 2403, 2404, 2415 mdls 4, 5 and 6, and 2420 mdls 5 and 7. For nine track 1600 bpi PE operation only, specify Single Density (#6631) ... see "Special Features" for limitations and prerequisites.

Nine Track 800 bpi NRZI Operation -- tape is written at 800 bpi in the nine track NRZI format as well as in the 1600 bpi PE format. Data representation is the same as for 1600 bpi PE operation. For nine track 800 bpi NRZI capability, Dual Density (#3550) is required on the tape unit ... see "Special Features" for limitations and prerequisites.

Seven Track Operation -- tape is written in the seven track format compatible with tapes written at either 556 or 800 bps by 729/7330/7335 and 2401/2402/2403/2404/2415 tape drives equipped with seven-track read/write heads. For seven track operation, Seven Track (#6407) is required on the tape unit ... see "Special Features" for limitations and prerequisites.

Checking -- each byte is parity checked while tape is being read. Data written on tape is read back instantly and checked as in reading, with full parity check.

Error Correction -- single track drop-out errors are corrected "in flight" during 1600 bpi read operations.

Read Backwards -- all tapes (9- or 7-track) written on a 2401/2402/2403/2404/2415/2420 can be read by the 3420 in a forward or backward direction. The Data Conversion function is inoperative during backward read of 7-track tapes.

Limitations:

Model 3 cannot be attached to the multiplexer channel of the S/360 mdl 22 or 30.

Model 5 cannot be attached to the multiplexer channel of the S/360 mdl 22, 30, 40, or 50. Model 5 at 1600 bpi PE cannot be attached to S/360 mdl 22. If the 3420 mdl 5 is ordered for attachment to a selector subchannel feature of the 2870, consult

Model 7 cannot be attached to S/360 mdl 22, 30 or 40, S/370 mdl 115 or 125, nor to the 2870.

OS does not support burst mode devices on multiplexer channels on S/360 mdls 22, 30, 40 or 50, or on the basic 2870 multiplexer channel. Programming support for the extended diagnostic capabilities of the 3420 requires a minimum of 32K core.

Supplies -- one standard 10-1/2" reel of magnetic tape in an easyload cartridge is shipped with each tape unit. For additional reels of tape and cartridges, see IRD sales manual.

PREREQUISITE: A 3803 Tape Control.

Characteristics:	Model 3	Model 5	Model 7
Nominal Data Rate (kb/sec)			
At 1600 bpi PE	120	200	320
At 800 bpi NRZI	60	100	160
At 556 bpi (7-track)	41.7	69.5	111.2
At 200 bpi (7-track)	15	25	40
Recording Density (Bytes/inch)	---- 1600/800/556/200 ----		
Tape Speed (Inches/second)	75	125	200
Nominal IBG (Inches)			
Nine-track	0.6	0.6	0.6
Seven-track	0.75	0.75	0.75
Nominal IBG Time (ms)			
Nine-track	8.0	4.8	3.0
Seven-track	10.0	6.0	3.75
Rewind Time (2400' Reel, Seconds)	60	60	45
Rewind-Unload Time (2400' Reel, Seconds)	66	66	51
Auto Threading Time* (Seconds)	10	10	7
Nominal Read/Write Access Time** (ms)	4.0	2.9	2.0

* From initiation (using mounted supply reel) to "Tape Drive Ready."

** Access time is the interval from initiation of a write or forward read command until the first data byte is read or written when tape is brought up to speed from stopped status.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

Specify: [1] One **AND ONLY ONE** of the following must be specified for each tape unit ... see "Special Features."

- #6631 (Single Density) -- for 9-track 1600 bpi PE operation only.
- #3550 (Dual Density) -- for 9-track 800 bpi NRZI operation as well as 1600 bpi PE.
- #6407 (Seven Track) -- for 7-track 556 or 800 bpi NRZI operation.

NOTE: MES orders for these features to effect field changes should consider that one of these three features **MUST** be installed on the 3420 or it is incomplete.

[2] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[4] Tape Reels: If any color other than gray is desired, specify #9051 for red, #9053 for blue, or #9054 for white.

PRICES: Mdl	- FTP/ - ETP/				Purchase	MMMC
	MAC/MRC	MLC 1 yr†	MLC 2 yr	MLC 2 yr		
3	\$436	\$401	\$366	\$366	\$13,660	\$ 83
5	586	539	492	492	18,320	91
7	694	638	583	583	20,520	108

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Purchase Option: 55% Maintenance: A
Metering: I/O Unit (On-line) Per Call: 3
Warranty: B Useful Life Category: 2
Model/Feature Additional Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

ETP/FTP/MLC ... all models of the 3420 may be under ETP/MLC or FTP/MLC.

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	Model 5	Model 7
Model 3	\$4,660	\$8,580
Model 5	---	8,580

NOTE: For upgrades to mdls 4, 6 or 8, see 3420 mdl 4, 6, 8.

SPECIAL FEATURES

DUAL DENSITY (#3550). Permits the tape unit to operate at 800 bpi NRZI nine track as well as at 1600 bpi PE. **Limitation:** Cannot be installed with either Single Density (#6631) or Seven Track (#6407). [Field installable except for machines with serial #90XXX.] **Prerequisite:** Dual Density (#3551) on the 3803 Tape Control.

SEVEN TRACK (#6407). Permits the tape unit to operate at either 556 or 800 bpi NRZI in the seven track format compatible with 729, 7330, 7335 and 2401, 2402, 2403, 2404, 2415 tape units equipped with seven track read/write heads. **Limitation:** Cannot be installed with either Single Density (#6631) or Dual Density (#3550). [Field installable only to replace Dual Density (#3550), otherwise available at time of manufacture only.] **Prerequisite:** Seven Track (#6408) on the 3803 Tape Control.

SINGLE DENSITY (#6631). Permits the tape drive to read or write tapes at 1600 bpi PE. **Limitation:** Cannot be installed with either Dual Density (#3550) or Seven Track (#6407). **Field Installation:** Yes. **Prerequisite:** One of the following on the 3803 Tape Control -- Single Density (#9570), Dual Density (#3551), or Seven Track (#6408).

Special Feature Prices:		-- FTP/ -- ETP/				Purch	MMMC
		MAC/MRC	MLC 1 yr†	MLC 2 yr	MLC 2 yr		
Dual Density	#3550	\$134	\$123	\$113	\$113	\$4,245	\$41.00
Seven Track	6407	103	95	87	87	3,290	41.00
Single Density	6631	103	95	87	87	3,290	24.50

† FTP is 12-23 months.

**3420 MAGNETIC TAPE UNIT - MODELS 4, 6, 8****Purpose:** Magnetic Tape Unit for S/370.

Model 4	470,000 eight-bit bytes/second for use with any S/370 Processor (except 3115 or 3125), or a 3800 Printing Subsystem.
Model 6	780,000 eight-bit bytes/second for use with any S/370 Processor (except 3115 or 3125), or a 3800 Printing Subsystem.
Model 8	1,250,000 eight-bit bytes/second for use with any S/370 Processor (except 3115 or 3125), or a 3800 Printing Subsystem.

Highlights: Nominal recording density of 6250 user bytes per inch with a .3 inch inter-block gap.**Radial Attachment** -- of tape drives to the control unit via a switch located in the control unit, permitting off-line service of individual tape units without disturbing the subsystem. 24-line multiplex interface provides advanced diagnostic capability.**Cleaning Mechanism** -- a new cleaning mechanism is engaged during auto-threading, rewinding and unloading operations to remove loose contaminants from the tape surface and to protect the recording head. This new cleaning mechanism makes tape cleaning a by-product of tape processing. The cleaning mechanism does not, however, replace drive cleaning by the operator, nor does it replace the need for normal library maintenance.**Automatic Threading and Cartridge Loading** -- threading is automatic with or without the wraparound cartridge; automatic retry (with cartridge only) in case of load failure, stopping on the leader to prevent damage to the recorded surface. With the wraparound cartridge, tape is not exposed to contamination or damage.**Automatic Read Amplification** -- automatically adjusts the amplifier gain in the tape drive to each individual reel of tape when operating at 6250 bpi.**Checking** -- data written on tape is read back instantly to ensure later readability.**Read Backward** -- tapes written at 6250 bpi mode can be read in a forward or backward direction. Tapes written at 1600 bpi (Phase Encoded) mode can be read in a forward or backward mode if the 3420 mdl 4, 6 or 8 is equipped with the 6250/1600 bpi optional feature ... see "Special Features."**6250/1600 BPI** -- an optional feature allows the 3420 mdl 4, 6 or 8 to read and record at 1600 bpi (Phase Encoded) density as well as at 6250 bpi density ... see "Special Features."**S/360 Attachment** -- one channel of 3420 mdl 4s may be attached via a 3803 mdl 2 to S/360 mdl 50 by no-charge RPQ ... 3420 mdl 4, 6 or 8 may be attached via a 3803 mdl 2 to S/360 mdls 65 thru 195 (mdl 67 operating in 65 mode) by no-charge RPQ. S/360 stand-alone emulators are not supported.**Tape Media** -- most tape volumes which operate satisfactorily on 3420 mdls 3, 5 and 7 will operate with equal or better read-write reliability for an equivalent number of bytes transferred on 3420 mdls 4, 6 or 8. Nevertheless, tapes must conform to the IBM Tape Specifications, GA32-0006.**PREREQUISITE:** A 3803 Tape Control mdl 2.**Limitations:** 3420 mdls 4, 6 and 8 via a 3803 mdl 2 control unit are not supported on byte multiplexer, multiplexer, or 2870 Selector Subchannels at either 6250 or 1600 bpi. 3420 mdls 6 or 8 cannot be attached to S/360 mdl 50. When contemplating the attachment of 3420 mdls 6 or 8 to S/370 mdl 135, 135-3, 145 or 145-3, consult *System 370 Model 135 Channel Characteristics (GA33-3010)*, *System 370 Model 138 Channel Characteristics (GA33-XXX)*, *System 370 Model 145 Channel Characteristics (GA24-3573)* or *System 370 Model 148 Channel Characteristics (GA24-XXXX)*.**Supplies:** One standard 10-1/2" reel of magnetic tape tested for 6250 bpi in an Easyload I cartridge is shipped with each tape unit. additional reels of tape and cartridges,

Characteristics	Model 4	Model 6	Model 8
Tape Speed (in/sec)	75	125	200
Recording Density	6250/1600	6250/1600	6250/1600
Nominal Data Rate (kb/sec)			
at 6250	470	780	1250
at 1600	120	200	320
Nominal IBG (in)			
at 6250	0.3	0.3	0.3
at 1600	0.6	0.6	0.6
Nominal Read/Write Access (ms)*			
at 6250	2.3/2.1	1.6/1.5	1.1/.95
at 1600	4.0/3.0	2.6/2.0	1.7/1.3
Max Rewind Time (sec)	60	60	45
Max Rewind-Unload (sec)	66	66	51
Max Auto Thread (sec)**	10	10	7

* Access time is the time required to read or write the first byte of data in a block after a read/write instruction has been initiated from a stopped position (read/write head positioned in the IBG).

** From initiation (using mounted supply reel) to "Tape Drive Ready."

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Tape Reels: If any color other than gray is desired, specify #9051 for red, #9053 for blue, or #9054 for white.

[4] Density: One and only one of the following, #6420 or #6425, must be specified ... see "Special Features."

PRICES: Mdl	-- FTP --		ETP/		Purchase	MMMC
	MAC/MRC	MLC 1 yr†	MLC 2 yr	MLC 2 yr		
4	\$608	\$559	\$511	\$511	\$21,960	\$ 83
6	702	646	590	590	25,650	91
8	834	767	701	701	28,440	133

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Purchase Option: 55% Maintenance: A
Metering: I/O Unit (on-line) Per Call: 3
Warranty: B Useful Life Category: 2
Model/Feature Additional Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%**ETP/FTP/MLC:** Both an ETP/MLC and a FTP/MLC Plan are optionally available. Customers can transfer to ETP/MLC when the 3803 mdl 1 is converted to a mdl 2 or when 3420s are model changed or at any time thereafter. The early termination charge does not apply but the two year ETP/MLC commitment period begins at the date of the ETP/MLC contract, not the FTP/MLC contract.

3420s and 3803s shipped from the plant may be under ETP/MLC, FTP/MLC or MAC/MRC at the customer's option.

Model Changes: Field installable ... any 3420 mdl 3, 5 or 7 can be converted to a 3420 mdl 4, 6 or 8 in the field.**MODEL UPGRADE PURCHASE PRICES** (there are no additional installation charges)

From To	Model 4	Model 6	Model 8
Model 3	\$ 9,540	\$13,230	\$16,020
Model 5	9,540	10,150	16,020
Model 7	9,540	10,150	10,750
Model 4		3,690	12,780
Model 6			12,780

SPECIAL FEATURES**6250 DENSITY (#6420).** Permits the tape unit to operate at nine track 6250 bpi ... either this feature or #6425 must be specified. **Limitation:** Cannot be installed with 6250/1600 Density (#6425).**6250/1600 DENSITY (#6425).** Permits the tape unit to operate at 6250 bpi density as well as 1600 bpi (Phase Encoded) density ... either this feature or #6420 must be specified. **Limitation:** Cannot be installed with 6250 Density (#6420).

Special Feature Prices:	-- FTP --		ETP/		Purch	MMMC	
	MAC/MRC	MLC 1 yr†	MLC 2 yr	MLC 2 yr			
6250 Density	#6420	\$61	\$56	\$51	\$51	\$2,295	\$41.00
6250/1600 Density	6425	87	80	73	73	3,160	49.50

† see preceding page



DP Machines

M 3501
May 79

IBM 3501 CARD READER

Purpose: Punched card input unit for the 3770 Data Communication System, or 8100 Information System via 3289 Printer model 3.

Highlights: Used for automatic entry of punched card data. The 3289 Printer mdl 3 or 3770 System performs all format control and analysis.

Rated 80-column card speed is 50 cards per minute. Cards are read serially by a sensing mechanism which is checked for proper functioning in every card cycle. EBCDIC or ASCII (3770 System only) code can be read. Hopper and stacker capacity is approximately 400 cards.

The 3501 is packaged as a table-top device.

Card Limitations: Generally, special feature cards require careful handling and a favorable environment. Use of the following has been approved:

External Scores (after separation) -- Column 1 Edge: M-3, M-4, M-5. Column 80 Edge: M-7. All Edges: CF-11.

Corner Cuts -- Any corner: C5. Upper right and upper left corners: C1, C2, C3.

Verified Cards -- approved cards with verify notch between rows 0 and 1, column 80 edge; or verify punch 2 and 3 in column 81 area.

Card Stock -- regular, edge coated, and heavy duty.

All other special feature cards may result in unsatisfactory performance.

PREREQUISITE: 3501 Card Reader Attachment (#8050) on the 3289-3, 3771, 3774, 3775 or 3776.

Limitation: Cannot be installed on a machine with a 2502 Card Reader.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9901.

[2] Documentation: One must be specified. #9101 for use with a 3771, #9102 for use with a 3289-3, 3774 or 3775, or #9103 for use with a 3776.

[3] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual - Physical Planning, GA27-3006.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
	3501	1	\$114	\$ 97	\$3,400 \$17.00

Plan Offering: Plan B Purchase Option: 60% Maintenance: C
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%



DP Machines

M 3504
May 79

IBM 3504 CARD READER

Purpose: Punched card input unit for a S/370 mdl 125.

Model Rated 80-column Card Speed

A1	800/minute
A2	1200/minute

Highlights: The 3504 is a high-speed, fully buffered card reader that attaches natively to a CPU via an Integrated 3504 Card Reader Attachment on the 3125. The 3504 is a natively attachable version of the 3505 Card Reader.

Both models have a 3,000-card capacity file feed and two 1,750-card capacity non-programmable stackers which operate in an alternating mode. Feeding from the file feed hopper is by means of friction feed rolls with vacuum assist. Failure to feed a card from the hopper is followed automatically by up to 3 retries before the machine stops.

Both models have read column eliminate capability which provides the user, under program control, the ability to suppress the reading of selected card columns. It is recommended for use to prevent reading in columns that could cause validity and read checks due to invalid codes or open-punched card scores.

Holes in the card are read by a light sensing mechanism which is checked for correct operation in every card cycle. Cards punched in either Extended BCD Interchange Code (Data Mode 1) or Card Image (Data Mode 2) can be read. Machine checks are made for invalid codes (Data Mode 1 punching only), off-punching, and mispositioned cards.

Maximum: One 3504 mdl A1 or mdl A2 can be attached to a 3125.

PREREQUISITE: An Integrated 3504 Card Reader Attachment (#4680) on the 3125.

Card Limitations: Generally, special feature cards require careful handling and a favorable environment. Use of the following card features has been approved:

Internal Scores (before separation) — M-4, M-5, OM-2, OM-3, ID-1, ID-2, ID-3 and S-1 **NOTE:** When using OM-2 or OM-3, either reading must be terminated prior to the column that is scored, or, reading of the scored column and the two adjacent columns must be suppressed by means of program-controlled Read Column Eliminate. S-2 may be used prior to folding, and after folding if the card is properly flattened.

External Scores (after separation) — column 1 and 80 end: M-3, M-4, M-5, M-6, M-7, M-11, OM-2, CF-4 and CF-11. Column 1 end only: OM-3. 12 and 9 edge:

Corner Cuts — any corner: C1, C2, C3 and C5.

Card Stock — regular, edge coated, and heavy duty.

Port-A-Punch — can be processed.

All other special feature cards may result in unsatisfactory performance and should be tested in an actual application prior to being recommended.

Billography: GC20-0001

SPECIFY: [1] Voltage (AC, 60 Hz supplied by system): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] High Altitude Group: #9220 ... to be specified when Card Reader is to be installed in an altitude exceeding 4,300 feet.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
3504	A1	\$ 606	\$ 516	\$21,210	\$103
	A2	736	626	22,250	139

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Purchase Option: 45% Warranty: B
Metering: I/O Unit (On-line) Per Call: 2
Upper Limit Percent: 0% Useful Life Category: 2
Model/Feature Additional Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model A1 to Model A2 \$1,040

SPECIAL FEATURES

51/80-COLUMN INTERCHANGEABLE READ FEED (#3921). [Mdl A2 only] For feeding and reading 51-column cards. The 51 columns of data appear in positions 1 thru 51 of the 80-position buffer. A special card weight, file feed and hopper liners and stacker guide assemblies are provided so that the operator can adjust for 80 or 51-column operations. Intermixed cards on the same operation are not supported. Reading speed of the 3504 is maintained. With this feature installed, the capacity of each stacker is permanently reduced to 1500 cards. Can be used with all other 3504 features. **Field Installation:** Not recommended.

OPTICAL MARK READ (#5450). For reading up to 40 columns of marked data. Marked and/or punched hole data can be read from a card. Columns in which marks are unacceptable are transmitted as Hex "3F" characters. Same validity checking applies as for holes. Can be used in Card Image mode, in which case the validity check is suspended. **Note:** See SRL GA21-9124 for card and format specifications. It is recommended that Selective Stacker (#6555) be installed for program selecting poorly marked cards. **Limitation:** Cannot be used simultaneously with the read column eliminate function. **Field Installation:** Yes. **Prerequisite:** 3504 Optical Mark Read Control (#9783) on the 3125.

SELECTIVE STACKER (#6555). Provides a third stacker (second logical stacker) which permits time-independent card selection under program control. Card capacity is 1,750 cards. When actually using this feature under DOS, the maximum speed of model A2 on the 3125 is approximately 1,150 cards/minute. **Field Installation:** Yes. **Prerequisite:** 3504 Selective Stacker Control (#9784) on the 3125.

Special Feature Prices:	ETP/ MAC/ MLC		Purchase	MMMC	
	MRC	2 Yr			
51/80-Col Interchangeable Read Feed	#3921	\$157	\$134	\$5,300	\$ 51
Optical Mark Read	5450	234	199	8,420	48
Selective Stacker	6555	61	52	2,375	9



3505 CARD READER

Purpose: Punched card input for a S/360 mdl 195 or all S/370 or 4300 Processors.

Model	Rated 80-column Card Speed
B1	800/minute
B2	1200/minute

Highlights: The 3505 is a high-speed, fully buffered, card reader, containing its own control unit. With appropriate adapter and control features installed (see "Special Features"), the 3505 provides the power and logic to control one 3525 Card Punch.

All models have a 3,000-card capacity file feed and two 1,750-card capacity non-programmable stackers which operate in an alternating mode. Feeding from the file feed hopper is by means of friction feed rolls with vacuum assist. Failure to feed a card from the hopper is followed automatically by up to 3 retries before the machine stops.

All models have read column eliminate capability which provides the user, under program control, the ability to suppress the reading of selected card columns. It is recommended for use to prevent reading in columns that could cause validity and read checks due to invalid or open-punched card scores.

Holes in the card are read by a light sensing mechanism which is checked for correct operation in every card cycle. Cards punched in either the Extended BCD Interchange Code (Data Mode 1) or Card Image (Data Mode 2) can be read. Machine checks are made for invalid codes (Data Mode 1 punching only), off-punching, and mispositioned cards.

Maximum: S/360 mdl 195 and all S/370 or 4300 Processors -- the number of 3505 mdls B1 and/or B2 that can be attached depends upon the number of system channel control unit positions available.

PREREQUISITES: Each 3505 requires an available control unit position on a channel.

S/360 mdl 195 and S/370 mdl 195 -- selector channel of 2860, basic multiplexer channel of 2870, or block multiplexer channel of 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Byte Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- byte multiplexer channel (standard), Selector Channels (special features), Block Multiplexer Channels (special features) ... see 3135.

S/370 mdl 135 - 3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- byte multiplexer channel (standard), Selector Channels (first one is standard), Block Multiplexer Channels (special features) ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channel (standard) ... see 3148.

S/370 mdl 155, 158 -- byte multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), Block Multiplexer Channels (first two are standard) ... see 3155, 3158.

S/370 mdl 165, 168 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) of 2870, or block multiplexer channel of 2880 ... see 2860, 2870, 2880.

3031, 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031, 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (special feature), block multiplexer channel (special feature) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channel (two are standard) ... see 4341.

Card Limitations: Generally, special feature cards require careful handling and a favorable environment. Use of the following card features has been approved:

Internal Scores (before separation) -- M-4, M-5, OM-2, OM-3, ID-1, ID-2, ID-3 and S-1. **NOTE:** When using OM-2 or OM-3, either reading must be terminated prior to the column that is scored, or, reading of the scored column and the two adjacent columns must be suppressed by means of program-controlled Read Column Eliminate. S-2 may be used prior to folding, and after folding if the card is properly flattened.

External Scores (after separation) -- column 1 and 80 end: M-3, M-4, M-5, M-6, M-7, M-11, OM-2, CF-4 and CF-11. Column 1 end only: OM-3. 12 and 9 edge:

Corner Cuts -- any corner: C1, C2, C3 and C5.

Card Stock -- regular, edge coated, and heavy duty.

Port-A-Punch -- can be processed.

All other special feature cards may result in unsatisfactory performance and should be tested in actual application prior to being recommended.

Bibliography: S/360 -- GC20--0360, S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] High Altitude Group: #9220 ... to be specified when Card Reader is to be installed in an altitude exceeding 4,300 feet.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
3505	B1	\$ 732	\$29,940	\$146
	B2	869	30,980	199

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: I/O Unit (Online) Warranty: B Maintenance: B
Purchase Option: 45% Useful Life Category: 2 Per Call: 3

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model B1 to Model B2 \$1,040.

SPECIAL FEATURES

51/80-COLUMN INTERCHANGEABLE READ FEED (#3921). [Mdl B2 only] For feeding and reading 51-column cards. The 51 columns of data appear in positions 1 thru 51 of the 80-position buffer. A special card weight, file feed and hopper liners, and stacker guide assemblies are provided so that the operator can adjust for 80 or 51-column operations. Intermixed cards on the same operation are not supported. Reading speed of the 3505 is maintained. With this feature installed, the capacity of each stacker is permanently reduced to 1500 cards. Can be used with all other 3505 features. **Field Installation:** Not recommended.

OPTICAL MARK READ (#5450). For reading up to 40 columns of marked data. Marked and/or punched hole data can be read from a card. Columns in which marks are unacceptable are transmitted as Hex "3F" characters. Same validity checking applies for holes. Can be used in Card Image Mode, in which case the validity check is suspended. **Note:** See SRL GA21-9124 for card and format specifications. It is recommended that Selective Stacker (#6555) be installed for program selecting poorly marked cards. **Limitation:** Cannot be used simultaneously with the read column eliminate function. **Field Installation:** Yes.

SELECTIVE STACKER (#6555). Provides a third stacker (second logical stacker) which permits time-independent card selection under program control. Card capacity is 1,750 cards. When actually using this feature under DOS, the maximum speed of model B2 on the 3115 or 3125 is approximately 1,150 cards/minute. **Field Installation:** Yes.

3525 CARD PRINT CONTROL (#8100). Provides control for Basic Card Print (#1421) installed on a 3525 Card Punch. Specify either #9791 for two-line, or #9792 for multi-line. **Field Installation:** Yes. **Prerequisite:** Either 3525 Punch Adapter (#8103) or 3525 Read Punch Adapter (#8105).

3525 PUNCH ADAPTER (#8103). Permits attachment of the 3525 Card Punch, without Card Read (#1533). **Limitation:** Not with #8105. **Field Installation:** Yes.

3525 READ PUNCH ADAPTER (#8105). Permits attachment of the 3525 Card Punch equipped with Card Read (#1533). **Limitation:** Not with #8103. **Field Installation:** Yes.

Special Feature Prices:		MAC/ MRC	Purchase	MMMC
51/80-Col Intchg Rd Fd	#3921	\$161	\$5,300	\$63.50
Optical Mark Read	5450	237	8,420	590
Selective Stacker	6555	63	2,375	11.50
3525 Card Print Control	8100	72	3,175	5.50
3525 Punch Adapter	8103	128	5,300	4.50
3525 Read Punch Adapter	8105	161	5,830	5.50

IBM 3521 CARD PUNCH

IBM 3525 CARD PUNCH

Purpose: Punched card output unit for the 3770 Data Communication System or 8100 Information System.

Highlights: Used primarily for punched card output on the 3770 System or 8100 Information System via 3289 Printer mdl 3 but can, when equipped with appropriate optional features, be used alternately as a card reader and/or to print information on a card. The 3289-3, 3771, 3774, 3775, 3776 or 3777 mdl 2 or 3 performs all format control and analysis.

Rated 80-column card speed is 50 cards per minute. Hopper and stacker capacity is approximately 400 cards.

The 3521 is a table-top unit that is placed on top of the 3782 Card Attachment Unit mdl 1.

Card Limitations: Generally, special feature cards require careful handling and a favorable environment. Use of the following has been approved:

External Scores (after separation) -- column 80 end only: M-4 and M-6.

Internal Scores (before separation) -- M-4, M-5, OM-2, OM-3, ID-1, ID-2, ID-3, S-1. S-2 may be used prior to folding.

Note: Also see limitations that apply for Card Read/Punch Check (#1521).

Corner Cuts -- any corner: C1, C2, C3 and C5.

Note: The use of corner cuts C1, C2, C3 in the lower left and lower right corners of the card is not recommended since these cards cannot be read by the 3501 Card Reader.

Card Stock -- regular, edge coated, and heavy duty.

Verified Cards -- approved cards with verify notch between rows 0 and 1, column 80 edge; or verify punch 2 and 3 in column 81 area.

Colors -- brown, red, blue, white, yellow, salmon, green and natural. With Card Print (#1501), print contrast will be reduced on brown, red, blue, salmon and green cards.

All other special feature cards may result in unsatisfactory performance.

PREREQUISITES: A 3782 Card Attachment Unit mdl 1 for attachment to a 3289-3, 3771, 3774, 3775, 3776 or 3777 mdl 2 or 3 equipped with 3782/3521 Card Punch Attachment (#8150).

Bibliography: GC20-0001

SPECIFY: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9901.

[2] Documentation: One must be specified. #9101 for use with a 3771, or #9102 for use with a 3289-3, 3774, 3775, 3776 or 3777 mdl 2 or 3.

[3] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual - Physical Planning, GA27-3006.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
	3521	1	\$236	\$201	\$7,000 \$ 33

Plan Offering: Plan B Purchase Option; 60% Maintenance: C
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES

CARD PRINT (#1501). For printing up to 80 positions along the top edge of the card. A 64 character set (including blank) is provided. Orders must specify #9491 for EBCDIC, or #9494 for ASCII (3770 System only). Uses a blank ink roll replaceable by the customer .. **Field Installation:** Yes.

CARD READ/PUNCH CHECK (#1521). Allows the 3521 to be used alternately as either a card punch or card reader. Read speed is the same as punch speed (50 cpm). This feature also provides for detection of punching errors by comparing the data read from the card with the punch data for each column. When an error is detected, the machine stops and an error indicator is lit. **Field Installation:** Yes. **Limitations:** (1) Punch checking must be inhibited using 3770 or 8100 job control when punching cards with internal scores or cards that have been prepunched. (2) This feature is limited to the Punch Checking function only if the host 3289-3, 3774, 3775, 3776 mdl 1 or 2 is also equipped with a 2502 or 3501 Card Reader. (3) This feature is limited to the Punch Checking function only when the 3521 is attached to a 3776 mdl 3 or 4, or a 3777 mdl 2 or 3.

Special Feature Prices:		MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Card Print	#1501	\$ 69	\$ 59	\$2,120	\$ 8.00
Card Read/Punch Check	1521	61	52	1,880	23.00

Purpose: Punched card output unit for a S/360 mdl 195 or any S/370 Processor or 4300 Processor.

Model	Rated 80-column Card Speed
P1	100/minute
P2	200/minute
P3	300/minute

Highlights: The 3525 is a full-function card punch which, when equipped with the appropriate special features, can read and/or print as well as punch 80 column cards in a single pass through the machine. The 3525 attaches natively to a S/370 mdl 125, or via (and within 20 feet of) a channel-attached 3505 Card Reader mdl B1 or B2 to a S/360 mdl 195, any S/370 Processor, or any 4300 Processor ... see "Prerequisites" below.

The basic unit has a 1,200-card capacity hopper and two 1,200-card capacity stackers. Either the Extended BCD Interchange Code (256 codes) or Card Image (Data Mode 2) can be punched. Punches parallel, row by row. Cards go to stacker 1 unless program directed to stacker 2.

Card punching is checked by monitoring the movement of all 80 punches. A card in which a punching error is detected is automatically directed to a dedicated, 200-card capacity error stacker and followed by two automatic punching retries ... the first prepunched card is directed to the error stacker for analysis purposes ... the second prepunched card is directed to the stacker originally selected for the error card. *Note:* Because of automatic punch retry, it is recommended that prepunched or serially numbered preprinted cards not be used in a punch only mode. When operating in a read/punch mode ... see Card Read in "Special Features" ... detected punching errors do not result in an automatic punching retry and prepunched or serially numbered cards can be used. In a read/punch mode, a detected punching error causes the machine to stop and manual error recovery procedures are required.

Maximum: S/360 mdl 195, any S/370 Processor, or any 4300 Processor -- one 3525 can be attached via each 3505 Card Reader mdl B1 or B2 ... **S/370 mdl 125** -- one 3525 can be natively attached via the appropriate adapter on the 3125 ... see 3125.

PREREQUISITES: S/360 mdl 195, any S/370 Processor, or any 4300 Processor -- a 3505 Card Reader mdl B1 or B2 with a 3525 Punch Adapter (#8103), or 3525 Read Punch Adapter (#8105) ... **S/370 mdl 125** -- native attachment via the Integrated 3525 Card Punch Attachment (#4685) on the 3125.

Card Limitations: Generally special feature cards require careful handling and a favorable environment. Use of the following card features has been approved:

Internal Scores (before separation) -- M-4, M-5, OM-2, OM-3, ID-1, ID-2, ID-3 and S-1. When reading cards with internal OM-2 or OM-3 scores (Card Read feature installed), either reading must be terminated prior to the column that is scored, or reading of the scored column and the two adjacent columns must be suppressed by means of the program-controlled read column eliminate feature function provided standard with Card Read. S-2 may be used prior to folding, and after folding if the card is properly flattened.

External Scores (after separation) -- Column 1 and 80 end: M-3, M-4, M-5, M-6, M-7, M-11, OM-2, CF-4 and CF-11. Column 1 end only: OM-3. 12 and 9 edge: CF-1/9A.

Corner Cuts -- any corner, C1, C2, C3 and C5.

Card Stock -- regular, edge coated, and heavy duty.

Port-A-PunchR -- can be punched in unscored fields of the card. Scored columns of these cards cannot be read.

All other special feature cards may result in unsatisfactory performance and should be tested in an actual application prior to being recommended.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 60 Hz power provided by the 3125 for native attachment or by the 3505 mdl B1 or B2 for channel attachment): #9903 for 208 V, or #9905 for 230 V ... must be consistent with 3505 or system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] S/370 mdl 125 Adapter: #9690 ... required if the 3525 is to be attached via an Integrated 3525 Punch Attachment (#4685) on a 3125. **Field Installation:** Yes.

[4] Print Character Set: Required when Multiline Card Print (#5273) or Two-line Card Print (#8339) is ordered. #9677 -- for EBCDIC, or #9671 -- for ASCII. **Field Installation:** Yes.



3525 Card Punch (cont'd)

Card Code	EBCD Code	EBC-DIC	ASCII	Card Code	EBCD Code	EBC-DIC	ASCII
12-8-2	0100-1010	c	[	11	0110-0000	-	-
12-8-3	-1011	.	<	0-1	-0001	7	/
12-8-4	-1100	<	<	12-11	0110-1010	(blank)	\
12-8-5	-1101	(	(	0-8-3	0110-1011	,	%
12-8-6	-1110	+	+	0-8-4	-1100	%	%
12-8-7	-1111	!	!	0-8-5	-1101	-	-
12	0101-000	&	&	0-8-6	-1110	>	>
11-8-2	-1010	!	!	0-8-7	-1111	?	?
11-8-3	-1011	\$	\$	8-2	0111-1010	:	:
11-8-4	-1100	*	*	8-3	-1011	#	#
11-8-5	-1101	)	)	8-4	-1100	@	@
11-8-6	-1110	:	:	8-5	-1101	=	=
11-8-7	-1111	-	-	8-6	-1110	"	"
				8-7	-1111	'	'

TWO-LINE CARD PRINT (#8339). Identical in function to Multi-line Card Print (#5273) with the exception that printing is limited to lines 1 and 3 (above the 12 punching row and between rows 12 and 11). Maximum speed in cards/minute, when printing, depends upon the machine model only. Speeds are as follows:

	P1	P2	P3
1 line	100 cpm	200 cpm	300 cpm
2 lines	100 cpm	200 cpm	300 cpm

Limitation: Not with #5273. **Field Installation:** Yes. **Prerequisites:** Basic Card Print (#1421) on the 3525. Also see "Specify" [4] above for specifying the desired character set.

Special Feature Prices:	MAC/MRC	Purchase	MMMC
Basic Card Print	#1421	\$334	\$13,930
Card Read	1533	154	6,360
Multiline Card Print	5273	92	1,140
Two-Line Card Print	8339	15	727

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
3525	P1	\$ 517	\$21,210	\$ 91.50
	P2	655	22,040	122.00
	P3	790	22,870	152.00

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Purchase Option: 45% Maintenance: B
 Metering: I/O Unit (On line) Per Call: 3
 Warranty: B Useful Life Category: 2

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

- Model P1 to Model P2 \$ 830
- Model P1 to Model P3 1,660
- Model P2 to Model P3 830

SPECIAL FEATURES

BASIC CARD PRINT (#1421). Provides a print station following the punch station. Print mechanism consists of a print chain, 64 hammers, and a card stepping device. **Field Installation:** Not recommended. **Prerequisites:** 3525 Card Print Control (#8100) on 3505 Card Reader or 3525 Card Print Control (#4693) on the 3125. Also requires Two-line Card Print (#8339) or Multiline Card Print (#5273) on 3525.

CARD READ (#1533). Provides an optical hole-sensing station ahead of the punch station. Permits cards to be read in EBCDIC (Data Mode 1) or Card Image (Data Mode 2). Cards are read in parallel fashion (row by row) while the previous card is being punched. Data read is fully buffered and can be used to control later operations on the same card such as punching, printing, and stacker selection.

Read column eliminate is standard with the feature. Provides the ability, under program control, to suppress the reading of selected card columns. May be used to prevent reading in columns that could cause validity and read checks due to invalid codes or open-punched card scores. See Port-A-Punch under "Card Limitations" for restrictions. **Field Installation:** Yes. **Prerequisites:** 3525 Read Punch (#8105) on the 3505 mdl B1 or B2, or 3525 Card Read Control (#9794) on the 3125.

MULTILINE CARD PRINT (#5273). Provides the ability to print, under program control, on any or all of 25 printing lines on the card. Each print line is 64 characters long and print locations are identical to that of the 2560 MFCM. Maximum speed, in cards/minute, when printing is dependent upon the machine model, the average number of lines printed and the location of the printed lines. Typical speeds are as follows:

	P1	P2	P3
1 line	100 cpm	200 cpm	300 cpm
2 lines	100 cpm	200 cpm	240 cpm
3 lines	67 cpm	133 cpm	150 cpm
4 lines	67 cpm	114 cpm	133 cpm
6 lines	57 cpm	89 cpm	100 cpm
10 lines	44 cpm	62 cpm	67 cpm
25 lines	24 cpm	29 cpm	30 cpm

Limitation: Not with #8339. **Field Installation:** Yes. **Prerequisites:** Basic Card Print (#1421) on the 3525. Also see "Specify" [4] above for specifying the desired character set.



DP Machines

IBM 3540 DISKETTE INPUT/OUTPUT UNIT

M 3540
May 79

Purpose: Input/output device for use with any virtual storage S/370 Processor, or any 4300 Processor,

Model B1 Has one drive.

Model B2 Has two drives.

Highlights: The 3540 provides the ability to read or write IBM Diskettes on S/370, or any 4300 Processor systems. The diskette is the same recording medium used by the 3740 Data Entry System, and as such, the 3540 provides a facility for entering data recorded by the 3740 directly into a S/370, or any 4300 Processor. The IBM Diskette is organized into 75 tracks, 26 sectors per track, 128 bytes per sector. 73 tracks are used for data. The data capacity of the diskette is therefore, 1,898 sectors, or 242,944 bytes.

The models provide a choice of one or two diskette drives. Each drive uses a stepping motor to control the positioning of its associated read/write head assembly. Each drive also has an associated diskette hopper and stacker. Diskettes are fed, one at a time, from the hopper and automatically mounted on a drive spindle for read/write operations. Following completion of reading or writing, the diskette is automatically removed from the spindle and stacked. Hopper and stacker capacities are 20 diskettes each. Disk speed is 360 revolutions/minute.

The 3540 has a self-contained control unit and provides double 128-byte buffers associated with each drive. The control unit operates the drives in a non-shared mode and thus each drive requires a separate subchannel when attached to a byte multiplexer channel. Effective speed depends upon the number of sectors read or written per revolution and upon the average number of sectors recorded on the diskettes. Maximum speeds per drive, including program Open Time (2 seconds/disk for Read; 10 seconds/disk for Write), and including time to feed and stack diskettes, are shown below for several combinations. For simultaneous processing on both drives, the realizable speed per drive is a function of the type of channel, speed of the channel, type of operating system, and the application programs.

Sectors/ Revolution	Sectors/Minute (read)			Sectors/Minute (write)		
	Full Disk	1/2 Disk	1/5 Disk	Full Disk	1/2 Disk	1/5 Disk
1	600	575	520	170	165	155
2	600	575	520	310	295	265
13	2620	2255	1595	1500	1250	835
26	3635	2970	1925	2210	1710	1020

The 3540 is supported as a sequential DASD device only.

IBM Diskettes:

Limitation: The use of a 3540 on a S/370 does not eliminate the minimum configuration requirements for a card reader, except in a S/370 mdl 115 or 125 cardless configuration. Refer to "Minimum Configuration" paragraph of the "Systems" section for S/370 mdl 115 and 125.

For minimum configuration requirements on the 4331 or 4341 Processors, refer to the "Minimum Configuration" paragraphs of the "Systems" section for the 4300 Processors.

Maximum: The number of 3540 mdls B1 and/or B2 that can be attached depends upon the number of system channel control unit positions available.

PREREQUISITE: Each 3540 requires an available control unit position on a channel.

S/370 mdl 115, 125 -- Byte Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- Byte Multiplexer Channel (standard), Selector Channels (special features), Block Multiplexer Channel (special feature) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special feature) ... see 3138-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- Byte Multiplexer Channel (standard), Selector Channels (first one is standard), Block Multiplexer Channels (special features) ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 145 II, 158 -- Byte Multiplexer Channel (standard), 2nd Byte Multiplexer Channel (special feature), Block Multiplexer Channels (first two are standard) ... see 3155, 3158.

S/370 mdl 165 II, 168 -- selector channel of 2860, basic multi-

plexer channel of 2870, shared or non-shared subchannel of 2880 (non-shared is recommended) ... see 2860, 2870, 2880.

3031, 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031, 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (special feature), block multiplexer channel (special feature) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channel (two are standard) ... see 4341.

Bibliography: S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
3540	B1	\$ 679	\$ 578	\$22,870	\$37.00
	B2	1,023	871	34,830	51.50

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: I/O Unit (Online) Warranty: B Maintenance: C
Purchase Option: 50% Useful Life Category: 2 Per Call: 2
Model/Feature Additional Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From model B1 to model B2 \$11,960



IBM 3601 FINANCE COMMUNICATION CONTROLLER

Purpose: A programmable controller for attachment of 3600 Finance Communication System terminals to S/370 or 4300 Processors using appropriate virtual storage system control programs.

S/370 or 4300 Processor attachment is via a 3704/3705 Communications Controller using synchronous data link control (SDLC) transmission over various common carrier or user-owned transmission facilities. Attachment is also possible via the Communications Adapter feature on the 4331. See 4331 for details. **Note:** See "Programming" and "SCP" pages for attachment capability.

Model 1 A programmable controller with a diskette drive which accommodates one-sided removable diskettes, a maximum of six loops and a maximum of 56K bytes of user programmable storage.
Remote terminal attachments* are available.

Model 2A A programmable controller with a diskette drive which accommodates one-sided removable diskettes, a maximum of three loops, and a maximum of 120K bytes of user programmable storage.
Remote terminal attachments* are available.

Model 2B A programmable controller with a diskette drive which accommodates one or two-sided removable diskettes, a maximum of three loops, and a maximum of 120K bytes of user programmable storage.
Remote terminal attachments* are available.

Model 3A A programmable controller with a diskette drive which accommodates one-sided removable diskettes, diskette drive, a maximum of six loops, and a maximum of 120K bytes of user programmable storage.
Remote terminal attachments* are available.

Model 3B A programmable controller with a diskette drive which accommodates one or two-sided removable diskettes, a maximum of six loops and a maximum of 120K bytes of user programmable storage.
Remote terminal attachments* are available.

* Remote terminal attachments can be achieved on the total number of loops indicated by one or a combination of the following, as applicable.

DEVICE OR FEATURE	DEVICE OR FEAT. #	3601		
		2A	3A	3B
1200 BPS Loop				
Integrated Modem	#8001	--	5	5
Term. Attach Unit	3603-1	3	6	6
EIA Interface	RPQ	2	5	5

Highlights: Controls all the functions of 3600 Finance Communication System terminals. Controls data transmission between those terminals and the central processing site. Four SDLC Communications features are available one of which is required for transmission to and from the Host. An SDLC Communications feature at speeds from 1200 bps to 4800 bps or an SDLC Communications feature at speeds from 1200 bps to 9600 bps can be selected. Besides Host link speed differences the SDLC feature to 9600 bps allows a maximum controller aggregate baud rate of 12,000 bps for the loops independent of the host link speed ... see "Communications Features."

Model 1 -- contains approximately 24K bytes of programmable storage. Four additional increments of 8K bytes of programmable storage (for a total of 56K) are available. The amount of programmable storage available for application programming depends upon the attached terminal configuration and user environment ... see Additional Storage Feature (#1005).

Models 2A, 2B, 3A and 3B -- contain approximately 24K bytes of programmable storage. Six additional increments of 16K bytes or three increments of 32K bytes of programmable storage (for a total of 120K) are available. The amount of programmable storage available for application programming depends upon the attached terminal configuration and user environment ... see Additional Storage Feature (#1006 or #1007).

Models 1, 2A and 3A house a direct access diskette drive with a one-sided removable diskette which provides permanent storage for control and user programs, plus temporary and permanent storage for user data (sequential logging, random retrieval of data records, etc.).

Models 2B and 3B house a direct access diskette drive with a two-sided removable diskette which provides permanent storage for control and user programs, plus temporary and permanent storage for user data (sequential logging, random retrieval of data records, etc.).

All 3600 System terminals are attached by loops which operate at speeds of 1200, 2400 or 4800 bps for locally attached terminals and at 1200 bps for remotely attached terminals. The base unit provides one loop. Two additional loops are available on models 2A and 2B while five additional loops are available on models 3A and 3B. 1200 bps loop integrated modems are available on models 1, 3A and 3B only ... see "Special Features." **Note:** Either one or two 4800 bps loops per 3601 may be specified.

Communication between the 3601 and the 3704/3705 or the Communications Adapter (#1601) on the 4331 Processor may be either through the 1200 BPS Integrated Modem (#5500) on the 3601 or through an external modem using the EIA Interface (#3701) on the 3601. Local attachment can be made to a 3704/3705 or Communications Adapter (#1601) on the 4331 Processor via its local attachment feature using #3701 on the 3601. See "Modems" and "Special Features" below. Each 3601 operates in half-duplex mode. Duplex communication line operations are possible with multiple 3601s attached to the line, one 3601 transmitting while the other receives.

Can be programmed to operate independently when the S/370 or 4300 Processor is unavailable. Capable of controlling all terminal functions, executing arithmetic, and capturing data from the terminals for later transmission to the S/370 or 4300 Processor. A keylock is provided for the removable diskette. One key is provided.

Transmission: The 3601 operates over common carrier-provided or equivalent customer-owned communications facilities. For information concerning these facilities, see the M 2700 pages.

Modems: External modems operating at speeds up to 9600 bps may be used with SDLC features.

Modem BPS	Speed	Facility
3863	2400	Switched or non-switched voice grade lines
3872	2400	Switched or non-switched voice grade lines
3864	4800	Switched or non-switched voice grade lines
3874	4800	Switched or non-switched voice grade lines
3875	7200	Non-switched voice grade lines
3865	9600	Non-switched voice grade lines
*	9600	Non-switched digital data service

* No standard IBM Modem available.

Note: Switched line operation is not supported by the 3601/3602 integrated 1200 bps modem.

Supplies: customer-usable diskettes

Prerequisites: Communications Controller equipped with appropriate features ... see 3704, 3705 or 4331 [for Communications Adapter (#1601) on the 4331].

Bibliography: GC20-0370

SPECIFY: [1] Voltage (115 V AC, 1-phase, 60 Hz). #9880 for locking plug, or #9881 for non-lock plug. **Field Installation:** Not recommended.

[2] Controller Designation: Media distribution of Controller Data. Specify #9491 to identify the initial 3601 or 3602 ordered for use with a host system location, or specify #9492 to identify additional 3601s per host system.

If #9491 is specified for the 3601, specify: #9494 if there is no 3614 or 3624 with a first position designator attached to any 3601 on the same host system, or ... #9493 if there is a 3614 or 3624, with a first position designator and #9002, attached to any 3601 on the same host system, and/or ... #9495 if there is a 3614 or 3624 with a first position designator and #9001 attached to any 3601 on the same host system, or if encryption capability, via the Data Encryption Standard (DES), is desired on the 3600 controller. See 3614 Host Attachment Designation under "Specify" for the 3614, or Controller-Data Designation under "Specify" for the 3624.

If #9491 is specified, select the specify number of the desired media.

#9412	9/800 Magnetic Tape
#9413	9/1600 Magnetic Tape
#9414	9/6250 Magnetic Tape

If magnetic tape is not available on designated CPU, then select one of the following media. [DOS/VS users only]

#9431	80-Column Cards
#9432	96-Column Cards

When feature #9491 is specified, additional shipping information is required.



3601 Finance Communication Controller (cont'd)

This is the address to which the first controller data tape will be automatically shipped for the first controller ordered (with specify #9491).

Whenever controller data is updated by an E.C, it will be shipped to the most current TPC address.

[3] Cables: See M 10000 pages for pricing and ordering instructions. Also see *Installation Manual - Physical Planning*, GA27-2766.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
3601	1	\$593	\$505	\$17,800	\$80.00
	2A	499	425	11,100	79.00
	2B	564	480	12,600	97.50
	3A	593	505	13,100	80.00
	3B	658	560	14,600	98.50

Plan Offering: Plan B Machine Group: D Per Call: 1
Purchase Option: 55% Warranty: B Useful Life Category: 2
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Model 2A can be changed to Model 2B, 3A or 3B. Model 2B to Model 3B. Model 3A to Model 3B. **Field Installation:** Yes ... Model 2A to 2B, 2A to 3B, or 3A to 3B requires replacement of the diskette storage device. Adequate provision must be made for retaining data contained on the diskette by having the user remove it prior to the start of any conversion.

Model changes from Model 1 to Model 3A or 3B: At time of manufacture only.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges).

From	To	2B	3A	3B
2A		\$1,500*	2,000*	\$3,500*
2B				2,000*
3A				1,500*

*Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this model change involves removal of parts which become the property of IBM."

SPECIAL FEATURES

ADDITIONAL STORAGE FEATURE (#1005). [Model 1 only] Provides an additional 8,192 bytes of control storage for device attachment or an additional 8,192 bytes of user programmable storage. **Specify: #9581** for Control Storage for Device Attachment. Any combination of device types: 3603, 3604, 3606, 3608, 3610, 3611, 3612, 3614, 3615, 3616, 3618 and/or 3624 may be attached. Some combinations will require an optional 8,192 bytes of control storage provided by the use of feature #1005. To determine if #1005 is required, refer to the *Device Attachment Table - A* below. Calculate the sum of the attachment factors for

the combination of devices to be attached. Add the attachment factor one time only for each device type. If the attachment factor sum is 3 or less, feature #1005 (Specify #9581) is not required. If the attachment factor sum is greater than 3 but does not exceed 11, feature #1005 (Specify #9581) is required. If the sum is greater than 11, but does not exceed 14, two feature #1005s (Specify #9581) are required. An attachment factor of greater than 14 is not allowed. **Maximum:** For #1005 with #9581 specified - Two. **Field Installation:** Yes. **Specify: #9582** for User Programmable Storage. Additional Storage Feature (#1005) provides an additional 8,192 bytes of user programmable storage. **Maximum:** For #1005 with #9582 specified - Four. **Field Installation:** Yes

Device Attachment Table - A

Device Type/Feature/Function	Attachment Factor
3604	0
Mag. Stripe Encoder-Reader (#4905/4906)	0.6
3606	3.0
3608	5.8
3610, 3611 and/or 3612	2.4
3614 [with AET only]	2.2
3618	3.0

If additional function is required, utilize *Device Attachment Table - B* to determine if #1005 is required. Calculate the sum of the attachment factors for the combination of devices or function required. Add the attachment factor one time only for each device type. If the attachment factor sum is 2 or less, feature #1005 (Specify #9581) is not required. If the attachment factor sum is greater than two but does not exceed 10, feature #1005 (Specify #9581) is required. If the sum is greater than 10, but does not exceed 14, two feature #1005s (Specify #9581) are required. An attachment factor of greater than 14 is not allowed.

Device Attachment Table - B

A description of attachment factor functions not associated with a specify, machine or feature is given later in this section: See Attachment Factor Functions.

Device Type/Feature/Function	Attachment Factor
3603 or 3604 mdl 1-6	0
SDLC (#4501 or #4502)	0.7
Multiple Block I/O - Diskette	3.0
3614 or 3624 [Note 1]	1.2
3616 Part 1 [Notes 7 and 8]	0.5
Optional Instruction Locator	0.3
Instruction Enhancements	1.7
Address Sharing [Notes 2, 5 and 8]	0.6
3606 [Notes 2 and 5]	2.4
Translate Instruction (LTRT) [Note 3]	1.2
3270/3600 Datastream Mapping [Note 3]	8.0
Extended 3270/3600 Keyboard Mapping [Note 9]	1.2
Data Encryption Standard (DES) [Note 1]	1.5
Alternate Encryption Technique (AET) [Note 1]	1.0
Priority Dispatching (LCHAP) [Note 3]	0.3
Data Sequencing	1.6
Extended Statistical Counter Recording [Note 3]	1.3
3618	3.0
3615	3.2
3616 Part 2 [Notes 7 and 8]	3.0
3610, 3611 and/or 3612 [Note 4]	2.6
3608 Printer [Note 5]	2.8
Mag Stripe Encoder-Reader (#4905/4906) [Note 6]	0.7
Set Diskette	0.9
3604 mdl 7	0.5

Notes

- [1] Although both DES and AET may be included, a single 3614 may have either DES or AET but not both. A 3624 may have only DES.
- [2] Address sharing must be included if a 3606 is used.
- [3] The optional instruction locator must be included if this function is used. If more than one function requiring the optional instruction locator is used, the attachment factor for the locator need be included only once.
- [4] Any 3610, 3611 and 3612 combination constitutes one device type.
- [5] Address sharing must be included if a 3608 is used. The 3606 must also be included to use the 3608 keyboard/display. Address sharing need be included only once to utilize both the 3608 printer and keyboard/display.

3601 Finance Communication Controller (cont'd)

- [6] The Magnetic Stripe Reader (#4901 or #4902) need not be considered in computing the attachment factor.
- [7] Both 3616 Part 1 and 3616 Part 2 must be included if a 3616 is used.
- [8] Address sharing must be included if a 3616 is used. If more than one device/RPQ requiring address sharing is used, the attachment factor for address sharing need be included only once.
- [9] 3270/3604 Datastream Mapping must be included if the Extended 3270/3604 Keyboard Mapping is used.

ADDITIONAL STORAGE FEATURES:

#1006 -- Provides an additional 16,384 bytes of control storage for device attachment (Models 2A, 2B, 3A and 3B only), or an additional 16,384 bytes of user programmable storage (Models 2A, 2B, 3A and 3B only). This additional storage can be utilized for the following four purposes: 1) User Programmable Storage ... 2) User Programmable Storage Expansion ... 3) Control Storage, or ... 4) Control Storage Expansion. See below for description and limitations. **Specify: #9591** for Control Storage, or **#9592** for User Programmable Storage.

#1007 -- Provides an additional 32,768 bytes of user programmable storage (Models 2A, 2B, 3A and 3B only). This additional storage can be used for: 1) User Programmable Storage, or ...2) User Programmable Storage Expansion. See below for description and limitations. **Specify: #9602**.

- 1. **User Programmable Storage:** Used for configuration data and application programs.

Feature #1006, Specify #9592 - provides an additional 16,384 bytes of User Programmable Storage. **Maximum:** For #1006 with #9592: Two. **Field Installation:** Yes.

Feature #1007, Specify #9602 - provides an additional 32,768 bytes of User Programmable Storage. **Maximum:** For #1007 with #9602: One. **Field Installation:** Yes. **Prerequisite:** On controllers shipped prior to EC745887, Storage Expansion Feature (#6501) is required.

- 2. **User Programmable Storage Expansion:** (models 2A, 2B, 3A and 3B only). Used in addition to two #1006 (with #9592) increments or one #1007 (with #9602) increment of User Programmable Storage, described above, for the instruction sections of application programs. Neither application program constants nor configuration data can reside in expanded User Programmable Storage.

Feature #1006, Specify #9592 - provides an additional 16,384 bytes of User Programmable Storage. **Maximum:** (For User Programmable Storage plus User Programmable Storage Expansion): For #1006 with #9592 specified and with Storage Expansion Feature (#6501) - Six. **Prerequisite:** If more than two additional Storage Features (#1006 with #9592) are ordered, the Storage Expansion Feature (#6501) is required. **Field Installation:** Yes.

Feature #1007, Specify #9602 - provides an additional 32,768 bytes of User Programmable Storage. **Maximum:** (For User Programmable Storage plus User Programmable Storage Expansion): For #1007 with #9602 specified and with Storage Expansion Feature (#6501) - Three. **Prerequisite:** If more than one Additional Storage Feature (#1007 with #9602) are ordered, or if in conjunction with any Additional Storage Feature (#1006 with #9592), then, Storage Expansion (#6501) is required. **Field Installation:** Yes.

- 3. **Control Storage** -- Used for attachment of any combination of device types/functions/features which have associated attachment factors. See Device Attachment Table - C below. Some combinations of device types can be accommodated with no further increments of control storage, while other combinations require additional increments of control storage.

Feature #1006, Specify #9591 [Models 2A, 2B, 3A and 3B only] Provides one increment of 16,384 bytes of Control Storage for device attachment.

Two Additional increments, for a total of 3 are available with Control Storage Expansion (see below). To determine whether and how many control storage increments (#1006 with #9591) are required, refer to Device Attachment Table - C below. Calculate the sum of the attachment factors for the combination of devices and/or functions required. Add the attachment factor one time only for each device type, feature or function. If the attachment factor sum is 10 or less, feature #1006 with #9591) is not required. If the attachment factor sum is greater than 10, feature (#1006

with #9591) is required. An attachment sum greater than 22 is not allowed in this base attachment factor calculation. **Maximum (for Control Storage):** For #1006 with #9591 -- One. **Field Installation:** Yes.

- 4. **Control Storage Expansion (CSE)#1006, Specify #9591** [Models 2A, 2B, 3A and 3B only] Used to provide a greater attachment capability for certain features or devices which require an attachment factor. CSE supplements the base attachment factor limit of 22.0 by providing second and third increments of additional storage. An additional attachment factor of 12 can be obtained by utilizing the second increment of #1006 with specify **#9591** or 28 by utilizing the second and third increments of #1006 with specify **#9591**. Only the attachment factors associated with certain device types, features or functions can be applied against this expanded attachment factor capability ... see Device Attachment Table - C below.

While Control Storage Expansion provides additional attachment factor capability, the CSE attachment factor must be considered separately from the base attachment factor calculation. Specifically, the attachment factor for a given device or feature must be allocated against either the base or the expanded attachment factor but not both. **Maximum:** (For Control Storage plus Control Storage Expansion) -for #1006 with #9591 specified and with Storage Expansion Feature (#6501) -- Three. **Prerequisite:** If more than one #1006 with specify #9591 is ordered, the Storage Expansion Feature (#6501) is required. **Field Installation:** Yes.

Limitation: The maximum number of #1006s (whatever the combination of specify #9591 and #9592), is seven for controllers shipped prior to E.C. 745887. The maximum number of #1006s commencing with units with E. C. 745887 is nine. The maximum number of #1007s is three.

The maximum number of #1007 plus #1006 (whatever the combination of specifies #9602, #9591 or #9592) for controllers shipped prior to E.C. 745887 is:

	#1007 +	#1006
Quantity	3 +	1
Quantity	2 +	3
Quantity	1 +	5
Quantity	0 +	7

The maximum number of #1007s plus #1006s for controllers with E.C. 745887 is:

	#1007 +	#1006
Quantity	3 +	3
Quantity	2 +	5
Quantity	1 +	7
Quantity	0 +	9

Device Attachment Table - C

In the following table, attachment factors in the column labeled "Base" are applicable to the base attachment factor calculation only. Attachment factors in the column labeled "Base or Expanded" are applicable to either the base or expanded attachment factor calculation.

The 3600 controller loads support for devices/features into control storage in the sequence indicated by the following table. Those RPQs with an attachment factor are also in a prescribed sequence, as indicated in the *IBM 3600 Finance Communication System Configurator, GA27-2762*. The controller will always attempt to load each device, feature, or RPQ into base control storage. If a device, feature, or RPQ is encountered that will not fit into base control storage and it is applicable to expanded control storage, the controller will attempt to load it into expanded control storage. The above algorithm must be used to determine control storage requirements.

Refer to the *3600 Finance Communication System Configurator, GA27-2762*, for a comprehensive list of attachment factors and additional information regarding calculation of base and expanded attachment factors.

A description of attachment factor functions not associated with a specify, machine or feature is given later in this section: See Attachment Factor Functions.

3601 Finance Communication Controller (cont'd)

Device Type/Feature/Function	Attachment Factor	
	Base	Base or Expanded
3603 or 3604 mdl's 1-6	0	
Storage Expansion Feature (#6501)	1.0	
SDLC (#4501 or #4502)	0.7	
Multiple Block I/O - Diskette	3.0	
3614 or 3624 [Note 1]	1.2	
3616 Part 1 [Notes 7 and 8]	0.5	
Optional Instruction Locator	0.3	
Instruction Enhancements	1.7	
Address Sharing [Notes 2, 5 and 8]		0.6
3606 [Notes 2 and 5]	2.4	
Translate Instruction (LTRT) [Note 3]		1.2
3270/3600 Datastream Mapping [Note 3]		8.0
Extended 3270/3600 Keyboard Mapping [Note 9]		1.2
Data Encryption Standard (DES) [Note 1]		1.5
Alternate Encryption Technique (AET) [Note 1]		1.0
Priority Dispatching (LCHAP) [Note 3]		0.3
Data Sequencing		1.6
Extd Statistical Counter Recording [Note 3]		1.3
3618		3.0
3615		3.2
3616 Part 2 [Notes 7 and 8]		3.0
3610, 3611 and/or 3612 [Note 4]		2.6
3608 Printer [Note 5]		2.8
Mag Stripe Encoder-Reader (#4905/4906) [Note 6]		0.7
Set Diskette		0.9
3604 mdl 7		0.5

Notes

- [1] Although both DES and AET may be included, a single 3614 may have either DES or AET but not both. A 3624 may have only DES.
- [2] Address sharing must be included if a 3606 is used.
- [3] The optional instruction locator must be included if this function is used. If more than one function requiring the optional instruction locator is used, the attachment factor for the locator need be included only once.
- [4] Any 3610, 3611 and 3612 combination constitutes one device type.
- [5] Address sharing must be included if a 3608 is used. The 3606 must also be included to use the 3608 keyboard/display. Address sharing need be included only once to utilize both the 3608 printer and keyboard/display.
- [6] The Magnetic Stripe Reader (#4901 or #4902) need not be considered in computing the attachment factor.
- [7] Both 3616 Part 1 and 3616 Part 2 must be included if a 3616 is used.
- [8] Address sharing must be included if a 3616 is used. If more than one device/RPC requiring address sharing is used, the attachment factor for address sharing need be included only once.
- [9] 3270/3600 Datastream Mapping must be included if the Extended 3270/3600 Keyboard Mapping is used.

EIA INTERFACE (#3701). Provides the appropriate cables and interface logic necessary to attach an external IBM modem for communications to the host processor through the 3704/3705 or for local attachment to the 3704/3705 or the Communications Adapter (#1601) on the 4331 Processor without requiring modems ... see feature #4716 under 3704 or 3705, or feature #1601 under 4331. Non-IBM modems may be attached subject to the Multiple Suppliers System Policy. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** SDLC Communications Feature with Clocking (#6301 or #4501) or SDLC Communications Feature without Clocking (#6302 or #4502). **Limitation:** Cannot be installed with a 1200 BPS Integrated Modem (#5500).

LOOP FEATURE, ADD'L (#4735). Provides the ability to attach additional 3600 Finance Communication System terminals. **Maximum:** Two per models 2A and 2B. Five per models 1, 3A and 3B. **Field Installation:** Yes. **Prerequisite:** For each loop with any remotely attached terminals, 1200 BPS Loop Integrated Modem (#8001 or #8002) on a terminal or a 3603 is required. **Limitation:** A maximum of two loops (including the provided local loop) operating at 4800 bps per 3601 are allowed when one of the SDLC communication features (#4501 or #4502) are specified. Otherwise, the maximum is one loop operating at 4800 bps (including the provided local loop). Loop Integrated Modem (#8001) cannot be installed on models 2A and 2B. **Note:** The sum of the speeds of all loops in bits per second (bps) plus the speed of the SDLC link (#6301 or #6302) in bps cannot exceed 12,000 bps. When SDLC feature (#4501 or #4502) is installed,

the sum of all loops cannot exceed 12,000 bps (do not use the host link speed).

1200 BPS INTEGRATED MODEM (#5500). An integrated modem for operation at 1200 bps over non-switched half-duplex or duplex voice grade lines for communication to the CPU through the 3704 or 3705, or the Communications Adapter (#1601) on the 4331 Processor. **Note:** This integrated modem must communicate with another IBM 1200 bps integrated modem. **Specify:** #9651 for 4-wire strapping, or #9652 for 2-wire strapping. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** SDLC Communications Feature with Clocking (#4501 or #6301). **Limitation:** Cannot be installed with EIA Interface (#3701).

COMMUNICATIONS FEATURES -- each 3601 must be equipped with one of the following SDLC features and either the EIA Interface (#3701) or the 1200 BPS Integrated Modem (#5500) for communication with the host processor.

SDLC COMMUNICATIONS FEATURE WITH BUSINESS MACHINES CLOCKING (#4501). Required for attachment to communication lines through the 1200 BPS Integrated Modem (#5500), or the EIA Interface (#3701) with any external modem which does not have internal clocking at 1200 bps. The SDLC link speed of this feature need not be included when calculating the sum of the speeds not to exceed the aggregate baud rate of 12,000 bps. **Maximum:** One. **Limitations:** Cannot be installed with #6301, #6302 or #4502. **Field Installation:** Yes.

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#4502). Required for attachment to communication lines through an external modem which does have internal clocking at speeds up to 9600 bps. The SDLC link speed of this feature need not be included when calculating the sum of the loop speeds not to exceed the controller aggregate baud rate of 12,000 bps. **Maximum:** One. **Limitation:** Cannot be installed with #6301, 6302 or 4501. **Field Installation:** Yes. **Prerequisite:** EIA Interface (#3701).

SDLC COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCKING (#6301). Required for attachment to communication lines through the 1200 BPS Integrated Modem (#5500), or an EIA Interface (#3701) with any external modem which does not have clocking at 1200 bps, or for local attachment to a 3704 or 3705 Communications Controller or the Communications Adapter (#1601) on a 4331 Processor. **Maximum:** One. **Limitation:** Cannot be installed with #6302, #4501 or #4502. **Field Installation:** Yes.

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#6302). Required for attachment to communications lines through an external modem which does have internal clocking at speeds up to 4800 bps. **Maximum:** One. **Limitation:** Cannot be installed with #6301, 4501 or 4502. **Field Installation:** Yes. **Prerequisite:** EIA Interface (#3701).

STORAGE EXPANSION FEATURE (#6501). [mdl's 2A, 2B, 3A and 3B only] Provides capability of (1) expanding user programmable storage (#1006 with specify #9592 or #1007 with specify #9602) beyond 56K bytes, and/or (2) adding additional increments of #1006 with specify #9591, beyond 16K bytes. **Maximum:** One. **Field Installation:** Yes. **Note:** This feature (#6501) is required when more than one Additional Storage Feature (#1006 with specify #9591), or more than two Additional User Programmable Storage Features (#1006 with specify #9592), or more than one Additional Storage Feature (#1007 with specify #9602), or Additional Storage Feature (#1007 with specify #9602) with User Programmable Storage Feature (#1006 with specify #9592), are ordered. **Note:** Feature #6501 is a prerequisite for any feature #1007 on 3601 models 2A, 2B, 3A, or 3B shipped prior to EC 745887. **Limitation:** If Independent Release 4 and Controller Data ECs 745122 and 745123 are utilized, the controller will work properly with the Storage Expansion Feature (#6501) installed, but Control Storage Expansion cannot be utilized. If releases earlier than Independent Release 4 and Controller Data ECs 745122 and 745123 are utilized, neither the Storage Expansion Feature (#6501) nor more than one Additional Storage Feature (#1006 with specify #9591) should be installed.

1200 BPS LOOP INTEGRATED MODEM (#8001). [mdl 1, 3A or 3B only] An integrated modem for transmission to remotely located 3600 Finance Communication System terminals. Operates at 1200 bps over non-switched normal quality voice grade lines.

Note: Several remote loop configuration variations can be realized; e.g., see the IBM 3600 FCS Configurator, GA27-2762. However, regardless of configuration, the interconnecting common carrier facilities are always point-to-point circuits; either 2-wire half-duplex or 4-wire duplex. The common carrier does not tariff 3600 "remote loops". The customer should be referred to the configurator or information in the M 2700 pages for definition of the tariffed elements of the remote loop.

Maximum: One per Additional Loop Feature (#4735). **Field Installation:** Yes. **Prerequisite:** Additional Loop Feature (#4735).



3601 Finance Communication Controller (cont'd)

Each remote location must have either a 3604 Keyboard Display mdl 2, 3 or 4 equipped with a 1200 BPS Loop Integrated Modem (#8001 or #8002), a 3606 mdl 2, a 3608 mdl 2, a 3614 Consumer Transaction Facility with a 1200 bps Loop Integrated Modem (#8001) or a 3603 as the first attached remote unit in each physical (geographic) location.

Special Feature Prices:	MAC/ MRC	ETP/ MLC		Purch	MMMC
		2 Yr			
Add'l Storage Feature	#1005	\$32	\$27	\$637	\$ 5.00
Add'l Storage Feature	1006	58	49	1,170	10.00
Add'l Storage Feature	1007	76	65	1,560	7.50
EIA Interface	3701	12	10	318	4.00
Loop Feature, Add'l	4735	12	10	318	2.00
1200 BPS Integrated Modem	5500	19	16	500	5.00
SDLC Cmncnts Feature with Clocking	4501	42	36	1,075	11.00
without Clocking	4502	35	30	900	10.50
SDLC Cmncnts Feature with Clocking	6301	19	16	533	3.00
without Clocking	6302	12	10	358	2.50
Storage Expn Feature	6501	31	26	1,055	2.00
1200 BPS Loop Integrated Modem	8001	19	16	500	5.00

ATTACHMENT FACTOR FUNCTIONS

Data Sequencing -- allows user applications to sequence, in storage, a block of data items or to collate, in storage, data items from two separate blocks into a third block, according to a parameter list.

Set Diskette -- allows user applications to reset the temporary files, to specify the type of start-up (i.e. warm or cold) to be performed on the next load, and/or to initiate a load of the controller.

Instruction Enhancements -- provides the user application with the following new instructions:

Bit Manipulating - Test and Branch (LIFON, LIFOFF) -- provide a test, set, and branch function in a single instruction. This reduces the 3600 AP processing and memory requirements when processing single bits.

Logical Compare Data Immediate (CCDI) -- compares immediate data to data in a specified field.

Move Data Immediate (MVDI) -- moves immediate data to a specified field.

Load Data Immediate (LDDI) -- loads immediate data into specified register.

SCALE -- formats an input string of characters into a conveniently processable numerical format. When used in processing monetary input, functions such as the removal of the monetary symbol, commas, and periods from the input data are automatically done. In the event that cents were not in the input data, zero padding is optionally provided. SCALE should significantly reduce the number of instructions required to process monetary input.

Segment Indexing (SETX, TESTX, SETXREG) -- provides an alternate method of referencing data within a segment. Only fixed operands of 3600 instruction may be indexed. This function can be used to reduce the number of SETFPL instructions executed by the AP, thereby enhancing performance and reducing AP size. This function also provides a pseudo DSECT facility, thereby enabling an AP to more readily reference (1) variably displaced data beginning of a segment.

Branch on Index (BRANX) -- provides an index increment, compare and branch function in a single instruction. This instruction is used to control the number of times a series of AP instructions will be executed. Since the instruction algebraically increments a register, BRANX can be used in conjunction with the Segment Indexing facility to simplify the processing of tables.

Execute (LEXEC) -- provides a function similar to the S/370 EXECUTE instruction. The amount of data logically OR'ed into the target instruction may be 2, 4 or 6 bytes.

Priority Dispatching -- provides the ability to specify the order in which 3601/3602 workstations are dispatched. This function consists of the LCHAP instruction which activates or deactivates the dispatching priority specified in the table(s) generated by the PRIDSP macro.

Translate -- the LTRT instruction processes an input data stream against user specifiable translate table(s) to generate a translated output data stream. The LTRTBEG, LTRTENT and

LTRTGEN instructions assist the user application programmer in specifying the translate table(s).

Extended Statistical Counter Recording -- provides the option to enhance statistical counter recording facilities to assist in fault isolation of degraded loop segments. This facility is particularly useful when a loop consists of multiple remote locations.

Multiple Block I/O - Diskette -- permits multiple blocks to be accessed with a single execution of the LREAD and REPLACE instruction for permanent file and absolute addressing accesses. This may also result in enhanced performance when more than 3 blocks are read or 4 blocks are written.

3270/3600 Datastream Mapping -- provides, via four new 3600 assembler language instructions, 3600 controller assistance in converting 3270 output datastreams into any output datastream processable by 3600 attached devices, and 3604 input datastreams into 3270 input datastreams. Additionally, these instructions can aid in converting 3604 output display datastreams into 3270 output display datastreams. Input and output screen sizes are supported as specified by the application programmer. The 3270 TAB, CLEAR, PA and PF keys are simulated.

Extended 3270/3600 Keyboard Mapping -- provides simulation of the 3270 INSERT, DELETE, ERASE TO END OF FIELD and ERASE INPUT keyboard functions.



IBM 3602 FINANCE COMMUNICATION CONTROLLER

Purpose: A programmable controller for attachment of 3600 Finance Communication System terminals to S/370 or 4300 processors using appropriate virtual storage system control programs.

Attachment is via a 3704/3705 Communications Controller or the Communications Adapter (#1601) feature on the 4331 Processor using synchronous data link control (SDLC) transmission over various common carrier or user-owned transmission facilities.

NOTE: See "Programming" and "SCP" pages for attachment capability.

Model 1A A large-file programmable controller with a 5.2 meg disk, a drive which accommodates one or two-sided removable diskettes, 16K or 32K increments of storage, and a maximum loop capability of eight of which seven can be remote.

Model 1B A large-file programmable controller with a 9.3 meg disk, a drive which accommodates one or two-sided removable diskettes, 16K or 32K increments of storage, and a maximum loop capability of eight, of which seven can be remote.

Highlights: Controls all the functions of 3600 Finance Communication System terminals. Controls data transmission between those terminals and the central processing site. Four SDLC Communication features are available one of which is required for transmission to the Host. An SDLC Communications feature at speeds from 1200 bps to 4800 bps or an SDLC Communications feature at speeds from 1200 bps to 9600 bps can be selected. Besides Host link speed differences the SDLC feature to 9600 bps allows a maximum controller aggregate baud rate of 12,000 bps for the loops independent of the Host link speed ... see "Communications Features."

Contains approximately 24K bytes of programmable storage. Six additional increments of 16K, or three increments of 32K, bytes of programmable storage (for a total of 120K) are available. The amount of programmable storage available for application programming depends upon the attached terminal configuration and user environment ... see Additional Storage Feature (#1006 or #1007) under "Special Features."

Houses a direct access diskette drive with two-sided removable diskette which provides permanent storage for control and user programs, plus temporary and permanent storage for user data (sequential logging, random retrieval of data records, etc.).

Houses a disk storage device for storage of user data. This storage device is not removable except by service personnel. Includes a fixed head feature which will provide 8 additional heads with access to disk data on 8 tracks ... see Additional Disk Heads Feature (#1010, #1011).

All 3600 System terminals are attached by loops which operate at speeds of 1200, 2400 or 4800 bps for locally attached terminals and at 1200 bps for remotely attached terminals. The base unit provides one loop. Seven additional loops are available. Integrated modems are available on both models ... see "Special Features."
Note: Either one or two 4800 bps loops per 3602 may be specified.

Communication between the 3602 and the 3704/3705 or the Communications Adapter (#1601) feature on the 4331 Processor may be either through the 1200 BPS Integrated Modem (#5500) on the 3602 or through an external modem using the EIA Interface (#3701) on the 3602. Local attachment can be made to a 3704/3705 or the Communications Adapter (#1601) feature on the 4331 Processor via its local attachment feature using #3701 on the 3602. See "Modems" and "Special Features" below. Each 3602 operates in half-duplex mode. Duplex communication line operations are possible with multiple 3602s attached to the line, one 3602 transmitting while the other receives.

Can be programmed to operate independently when the CPU is unavailable. Capable of controlling all terminal functions, executing arithmetic, and capturing data from the terminals for later transmission to the CPU.

Transmission: The 3602 operates over common carrier-provided or equivalent customer-owned communications facilities. For information concerning these facilities, see the M 2700 pages.

Modems: External modems operating at speeds up to 9600 bps may be used with SDLC features.

Modem Speed (bps) Facility

3863	2400	Switched or non-switched voice grade lines
3872	2400	Switched or non-switched voice grade lines
3864	4800	Switched or non-switched voice grade lines
3874	4800	Switched or non-switched voice grade lines
3875	7200	Non-switched voice grade lines
3875	9600	Non-switched voice grade lines

* 9600 Non-switched digital data service

* No standard IBM Modem available.

Note: Switched line operation is not supported by the 3601/3602 integrated 1200 bps modem.

Supplies: For customer-usable diskettes, see IRD Sales Manual.

Prerequisite: Communications with a S/370 or 4300 Processor with virtual storage capability via a 3704 or 3705 Communications Controller equipped with appropriate features or the Communications Adapter (#1601) feature on the 4331 Processor ... see 3704, 3705 and 4331 pages.

Bibliography: GC20-0370

SPECIFY: [1] Voltage (AC, 1-phase, 60 Hz): Locking Plug -- #9880 for 115 V, #9884 for 208 V, #9886 for 230 V. Non-lock Plug -- 9881 for 115 V, #9885 for 208 V, #9887 for 230 V. **Field Installation:** Not recommended.

[2] Controller Designation: Media distribution of Controller Data. Specify #9491 to identify the initial 3602 or 3601 ordered for use with a host system location, or specify #9492 to identify additional 3602s per host system.

If #9491 is specified for the 3602, specify: #9494 if there is no 3614 or 3624 with a first position designator attached to any 3602 on the same host system, or ... #9493 if there is a 3614 or 3624, with a first position designator and #9002 attached to any 3602 on the same host system, and/or ... #9495 if there is a 3614 or 3624 with a first position designator and #9001 attached to any 3602 on the same host system or if encryption capability, via the Data Encryption Standard (DES), is desired in the 3600 controller. See Host Attachment Designation under "Specify" for the 3614, or Controller-Data Designation under "Specify" for the 3624.

If #9491 is specified, select the specify number of the desired media.

#9412	9/800 Magnetic Tape
#9413	9/1600 Magnetic Tape
#9414	9/6250 Magnetic Tape

If magnetic tape is not available on designated CPU, then select one of the following media. [DOS/VS users only]

#9431	80-Column Cards
#9432	96-Column Cards

When feature #9491 is specified, additional shipping information is required.

This is the address to which the first controller data tape will be automatically shipped for the first controller ordered (with specify #9491). Whenever controller data is updated by an E.C., it will be shipped to the most current TPC address.

[3] Cables: See M 10000 pages for pricing and ordering instructions. Also see *Installation Manual - Physical Planning*, GA27-2766.



3602 Finance Communication Controller (cont'd)

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
3602	1A	\$781	\$665	\$25,700	\$187
	1B	852	725	28,000	199

Plan Offering: Plan B
 Per Call: 1
 Useful Life Category: 2
 Termination Chg Months: 5

Machine Group: D
 Warranty: B
 Purchase Option: 55%
 Upper Limit Percent: 0%
 Termination Chg Percent: 25%

Model Changes: Model 1A can be changed to Model 1B. This upgrade requires replacement of the disk storage (not diskette) device. If Model 1A has Additional Disk Heads (#1010) installed, they will be replaced with #1011 concurrent with the upgrade. Adequate provision must be made for retaining data contained on disk storage and elimination of user proprietary information. **Limitation:** If model 1A does not have Additional Disk Heads (#1010) installed, field installation of the Additional Disk Heads (#1011) for model 1B concurrently with a model change from Model 1A to Model 1B requires submission of an RPQ.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Field conversion charge for Model 1A to Model 1B is \$2,300. *

* Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model change involves removal of parts which become the property of IBM."

SPECIAL FEATURES

ADDITIONAL STORAGE FEATURES:

#1006 -- Provides an additional 16,384 bytes of control storage for device attachment or an additional 16,384 bytes of user programmable storage. Additional storage can be utilized for the following purposes: 1) User Programmable Storage ... 2) User Programmable Storage Expansion ... 3) Control Storage ... and 4) Control Storage Expansion. See below for description and limitations. **Specify:** #9591 for Control Storage, or #9592 for User Programmable Storage.

#1007 -- Provides an additional 32,768 bytes of User Programmable Storage. Additional storage can be used for: 1) User Programmable Storage ... or 2) User Programmable Storage Expansion. See below for description and limitations. **Specify:** #9602.

1. **User Programmable Storage:** Used for configuration data and application programs.

Feature #1006, Specify #9592 -provides an additional 16,384 bytes of User Programmable Storage. **Maximum:** For #1006 with #9592 -- Two. **Field Installation:** Yes:

#1007, Specify #9602 -- provides an additional 32,768 bytes of User Programmable Storage. **Maximum:** For #1007 with #9602 -- One. **Field Installation:** Yes

2. **User Programmable Storage Expansion:** Used in addition to two #1006 with specify #9592 increments or one #1007 with specify #9602 increment of User Programmable Storage described above, for the instruction sections of application programs. Neither application program constants nor configuration data can reside in expanded user programmable storage.

Feature #1006, Specify #9592 -- provides an additional 16,384 bytes of User Programmable Storage. **Maximum:** [for User Programmable Storage plus User Programmable Storage Expansion]. For #1006 with #9592 and with Storage Expansion Feature (#6501) -- Six. **Prerequisite:** If more than two additional storage features (#1006 with #9592) are ordered, the Storage Expansion Feature (#6501) is required. **Field Installation:** Yes.

Feature #1007, Specify #9602 -- provides an additional 32,768 bytes of User Programmable Storage. **Maximum:** [For User Programmable Storage plus User Programmable Storage Expansion] For #1007 with #9602 and with Storage Expansion Feature (#6501) -- Three. **Prerequisite:** If more than one Additional Storage Feature (#1007 with #9602) is ordered, or if in conjunction with any Additional Storage Feature (#1006 with #9592), the Storage Expansion Feature (#6501) is required. **Field Installation:** Yes.

3. **Control Storage (Feature #1006 - Specify #9591).** Used for attachment of any combination of device types/features/functions, which have associated attachment factors ... see Device Attachment Table below. Some combinations of device types can be accommodated with no further increments of control storage, while other combinations require additional increments of control storage provided by use of feature #1006 with specify #9591.

One additional increment of control storage is available without utilizing Control Storage Expansion (#6501). Two additional increments, for a total of three, are available with #6501. To determine whether and how many control storage increments (#1006 with specify #9591) are required, refer to the *Device Attachment Table* below. Calculate the sum of the attachment factors for the combination of devices or functions required. Add the attachment factor one time only for each device type, feature or function. If the attachment factor is 10 or less, feature #1006 with specify #9591 is not required. If the attachment factor sum is greater than 10, feature #1006 with specify #9591 is required. An attachment factor greater than 22 is not allowed in this base attachment factor calculation. **Maximum:** (For Control Storage - #1006 with specify #9591) -- One. **Field Installation:** Yes.

4. **Control Storage Expansion (CSE)(Feature #1006 - Specify #9591).** Used to provide a greater attachment factor capability for certain features or devices which require an attachment factor. CSE supplements the base attachment factor limit of 22.0 by providing second and third increments of additional storage. An additional attachment factor capability of 12 can be obtained by utilizing the second increment of #1006 with specify #9591, or 28 by utilizing the second and third increments of #1006 with specify #9591. Only the attachment factors associated with certain device types, features or functions can be applied against this expanded attachment factor capability ... see *Device Attachment Table* below.

While Control Storage Expansion provides additional attachment factor capability, the CSE attachment factor must be considered separately from the base attachment factor calculation. Specifically, the attachment factor for a given device or feature must be allocated against either the base or the expanded attachment factor but not both. **Maximum:** (Control Storage plus Control Storage Expansion): For #1006 with specify #9591 -- Three. **Prerequisite:** If more than one Control Storage Feature (#1006 with specify #9591) is ordered, Storage Expansion Feature (#6501) is required. **Field Installation:** Yes.

Limitation: The maximum number of #1006s (with any combination of specifies #9591 and #9592) is nine. The maximum number of #1007s is three.

The maximum number of #1007s plus #1006s (whatever the combination of specifies #9602, #9591 or #9592) is:

	#1007	+	#1006
Quantity	3	+	3
Quantity	2	+	5
Quantity	1	+	7
Quantity	0	+	9

Device Attachment Table

In the following table, attachment factors in the column labeled "Base" are applicable to the base attachment factor calculation only. Attachment factors in the column labeled "Base or Expanded" are applicable to either the base or expanded attachment factor calculation.

The 3600 controller loads support for devices/features into control storage in the sequence indicated by the following table. Those RPQs with an attachment factor are also loaded in a prescribed sequence, as indicated in the *IBM 3600 Finance Communication System Configurator, GA27-2762*. The controller will always attempt to load each device, feature, or RPQ into base control storage. If a device, feature, or RPQ is encountered that will not fit into base control storage and it is applicable to expanded control storage, the controller will attempt to load it into expanded control storage. The above algorithm must be used to determine control storage requirements.

Refer to the *3600 Finance Communication System Configurator, GA27-2762* for a comprehensive list of attachment factors and additional information regarding calculation of base and expanded attachment factors.

A description of attachment factor functions not associated with a specify, machine or feature is given later in this section: See *Attachment Factor Functions*.

**3602 Finance Communication Controller (cont'd)**

Device Type/Feature/Function	Attachment Factor	
	Base	Base or Extended
3603 or 3604 mdl 1-6	0	
Storage Expansion Feature (#6501)	1.0	
SDLC (#4501 or #4502)	0.7	
Multiple Block I/O - Diskette	3.0	
3614 or 3624 [Note 1]	1.2	
3616 Part 1 [Notes 7 and 8]	0.5	
Optional Instruction Locator	0.3	
Instruction Enhancements	1.7	
Address Sharing [Notes 2, 5 and 8]		0.6
3606 [Notes 2 and 5]	2.4	
Translate Instruction (LTRT) [Note 3]		1.2
3270/3600 Datastream Mapping [Note 3]		8.0
Extended 3270/3600 Keyboard Mapping [Note 9]		1.2
Data Encryption Standard (DES) [Note 1]		1.5
Alternate Encryption Technique (AET) [Note 1]		1.0
Priority Dispatching (LCHAP) [Note 3]		0.3
Data Sequencing		1.6
Extd Statistical Counter Recording [Note 3]		1.3
Disk File (5.2 or 9.3 meg)		10.0
3602 Dynamic Sector Relocate		0.6
3618		3.0
3615		3.2
3616 Part 2 [Notes 7 and 8]		3.0
3610, 3611 and/or 3612 [Note 4]		2.6
3608 Printer [Note 5]		2.8
Mag Stripe Encoder-Reader (#4905/4906) [Note 6]		0.7
Set Diskette		0.9
3604 mdl 7		0.5

Notes

- (1) Although both DES and AET may be included, a single 3614 may have either DES or AET but not both. A 3624 may have only DES.
- (2) Address sharing must be included if a 3606 is used.
- (3) The optional instruction locator must be included if this function is used. If more than one function requiring the optional instruction locator is used, the attachment factor for the locator need be included only once.
- (4) Any 3610, 3611 and 3612 combination constitutes one device type.
- (5) Address sharing must be included if a 3608 is used. The 3606 must also be included to use the 3608 keyboard/display. Address sharing need be included only once to utilize both the 3808 printer and keyboard/display.
- (6) The Magnetic Stripe Reader (#4901 or #4902) need not be considered in computing the attachment factor.
- (7) Both 3616 Part 1 and 3616 Part 2 must be included if a 3616 is used.
- (8) Address sharing must be included if a 3616 is used. If more than one device/RPQ requiring address sharing is used, the attachment factor for address sharing need be included only once.
- (9) 3270/3600 Datastream Mapping must be included if the Extended 3270/3604 Keyboard Mapping is used.

ADDITIONAL DISK HEADS (#1010, 1011). [#1010 for mdl 1A ... #1011 for mdl 1B] Provides additional disk heads (8) for the disk file as specified by model type selected. **Maximum:** One. **Field Installation:** Not recommended.

EIA INTERFACE (#3701). Provides the appropriate cables and interface logic necessary to attach an external IBM modem for communications to the host processor through the 3704/3705 or the Communications Adapter (#1601) feature on the 4331 Processor or for local attachment to the 3704/3705 or the Communications Adapter (#1601) feature on the 4331 Processor without requiring modems ... see 3704/3705, feature #4716, or 4331 pages in sales manual. Non-IBM modems may be attached subject to the multiple Suppliers System Policy. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** SDLC Communications Feature with Clocking (#6301 or #4501) or SDLC Communications Feature without Clocking (#6302 or #4502). **Limitation:** Cannot be installed with a 1200 BPS Integrated Modem (#5500).

LOOP FEATURE, ADD'L (#4735). Provides the ability to attach additional 3600 Finance Communication System terminals. **Maximum:** Seven. **Field Installation:** Yes. **Prerequisite:** For each loop with any remotely attached terminals, a 1200 BPS Loop Integrated Modem (#8001 or #8002) on the terminal, or a 3603 is required. **Limitation:** A maximum of two loops (including the provided local loop) operating at 4800 bps are allowed when one of the SDLC Communication Features (#4501 or #4502) are

specified. Otherwise, the maximum is one loop operating at 4800 bps (including the provided local loop).

Note: The sum of the speeds of all loops in bits per second (bps) plus the speed of the SDLC link (#6301 or #6302) in bps cannot exceed 12,000 bps. When SDLC Feature (#4501 or #4502) is installed only the sum of the loops cannot exceed 12,000 bps.

1200 BPS INTEGRATED MODEM (#5500). An integrated modem for operation at 1200 bps over non-switched half-duplex or duplex voice grade lines for communication to the CPU through the 3704 or 3705 or the Communications Adapter (#1601) feature on the 4331 Processor. **Note:** This integrated modem must communicate with another IBM 1200 bps integrated modem. **Specify:** #9651 for 4-wire strapping, or #9652 for 2-wire strapping. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** SDLC Communications Feature with Clocking (#6301 or #4501). **Limitation:** Cannot be installed with EIA Interface (#3701).

COMMUNICATIONS FEATURES -- each 3602 must be equipped with one of the following SDLC features and either the EIA Interface (#3701) or the 1200 BPS Integrated Modem (#5500) for communication with the host processor.

SDLC COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCKING (#4501). Required for attachment to communication lines through the 1200 BPS Integrated Modem (#5500), or the EIA Interface (#3701) with any external modem which does not have internal clocking at 1200 bps. The SDLC link speed of this feature need not be included when calculating the sum of the loop speeds not to exceed the controller aggregate baud rate of 12,000 bps. **Maximum:** One. **Limitation:** Cannot be installed with #6301, 6302 or 4502. **Field Installation:** Yes.

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#4502). Required for attachment to communication lines through an external modem which does have internal clocking at speeds up to 9600 bps. The SDLC link speed of this feature need not be included when calculating the sum of the loop speeds not to exceed the controller aggregate baud rate of 12,000 bps. **Maximum:** One. **Limitation:** Cannot be installed with #6301, 6302 or 4501. **Field Installation:** Yes. **Prerequisite:** EIA Interface (#3701).

SDLC COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCKING (#6301). Required for attachment to communication lines through the 1200 BPS Integrated Modem (#5500), or the EIA Interface (#3701) with any external modem which does not have internal clocking at 1200 bps, or for local attachment to a 3704/3705 Communications Controller or the Communications Adapter (#1601) feature on the 4331 Processor. **Maximum:** One. **Limitation:** Cannot be installed with #6302, 4501 or 4502. **Field Installation:** Yes.

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#6302). Required for attachment to communication lines through an external modem which does have internal clocking at speeds up to 4800 bps. **Maximum:** One. **Limitation:** Cannot be installed with #6301, 4501 or 4502. **Field Installation:** Yes. **Prerequisite:** EIA Interface (#3701).

STORAGE EXPANSION FEATURE (#6501). Provides capability of (1) expanding user programmable storage (#1006 with specify #9592 or #1007 with specify #9602) beyond 56K bytes and/or (2) adding additional increments of #1006 with specify #9591, beyond 16K bytes. **Maximum:** One. **Field Installation:** Yes. **Note:** This feature (#6501) is required when more than 16K of additional control storage, Additional Storage Feature (#1006 with specify #9591) or more than 32K of additional user programmable storage Additional Storage Feature (#1006 with specify #9592) or Additional Storage Feature (#1007 with specify #9602) are ordered. **Limitation:** If Independent Release 4 and Controller Data ECs 745122 and 745123 are utilized, the controller will work properly with the Storage Expansion Feature (#6501) installed, but Control Storage Expansion cannot be utilized. If releases earlier than Independent Release 4 and Controller Data ECs 745122 and 745123 are utilized, neither the Storage Expansion Feature (#6501) nor more than one Additional Storage Feature (#1006 with specify #9591) should be installed.

1200 BPS LOOP INTEGRATED MODEM (#8001). An integrated modem for transmission to remotely located 3600 Finance Communication System terminals. Operates at 1200 bps over non-switched normal quality voice grade lines. **Note:** Several remote loop configuration variations can be realized; e.g., see the IBM 3600 FCS Configurator, GA27-2762. However, facilities are always point-to-point circuits; either 2-wire half-duplex or 4-wire duplex. The common carrier does not tariff 3600 "remote loops". The customer should be referred to the configurator or information in the M 2700 pages for definition of the tariffed elements of the remote loop. **Maximum:** One per Additional Loop Feature (#4735). **Field Installation:** Yes. **Prerequisite:** Additional Loop Feature (#4735). Each remote location must have either a 3604 Keyboard Display mdl 2, 3 or 4 equipped with a 1200 BPS Loop Integrated Modem (#8001 or #8002), a 3614 or 3624 Consumer Transac-

**3602 Finance Communication Controller (cont'd)**

tion Facility with a 1200 BPS Loop Integrated Modem (#8001), or a 3603 as the first attached remote unit in each physical (geographic) location.

Special Feature Prices:	MAC/ MRC	ETP/ MLC		Purch	MMMC
		\$	\$		
Add'l Storage Feature #1006	58	49	\$1,170	\$10.00	
Add'l Storage Feature 1007	76	65	1,560	7.50	
Add'l Disk Heads					
for Mdl 1A	1010	32	27	1,080*	17.00
for Mdl 1B	1011	32	27	1,080*	17.00
EIA Interface	3701	12	10	318	4.00
Loop Feature, Add'l	4735	12	10	318	2.00
1200 BPS Integrated Modem	5500	19	16	500	5.00
SDLC Cmnctns Feature					
with Clocking	4501	42	36	1,075	11.00
without Clocking	4502	35	30	900	10.50
SDLC Cmnctns Feature					
with Clocking	6301	19	16	533	3.00
without Clocking	6302	12	10	358	2.50
Storage Expn Feature	6501	31	26	1,055	2.00
1200 BPS Loop Integrated Modem	8001	19	16	500	5.00

*Feature prices are based on plant installation.

ATTACHMENT FACTOR FUNCTIONS

Data Sequencing -- allows user applications to sequence, in storage, a block of data items or to collate, in storage, data items from two separate blocs into a third bloc, according to a parameter list.

Set Diskette -- allows user applications to reset the temporary files, to specify the type of start-up (i.e., warm or cold) to be performed on the next load, and/or to initiate a load of the controller.

Instruction Enhancements -- provides the user application with the following new instructions:

Bit Manipulation - Test and Branch (LIFON, LIFOFF) -- provide a test, set, and branch function in a single instruction. This reduces the 3600 AP processing and memory requirements when processing single bits.

Logical Compare Data Immediate (CCDI) -- compares immediate data to data in a specified field.

Move Data Immediate (MVDI) -- moves immediate data to a specified field.

Load Data Immediate (LDDI) -- loads immediate data into specified register.

SCALE -- formats an input string of characters into a conveniently processable numerical format. When used in processing monetary input, functions such as the removal of the monetary symbol, commas, and periods from the input data are automatically done. In the event that cents were not in the input data, zero padding is optionally provided. SCALE should significantly reduce the number of instructions required to process monetary input.

Segment Indexing (SETX, TESTX, SETXREG) -- provides an alternate method of referencing data within a segment. Only fixed operands of 3600 instructions may be indexed. This function can be used to reduce the number of SETFPL instructions executed by the AP, thereby enhancing performance and reducing AP size. This function also provides a pseudo DSECT facility, thereby enabling an AP to more readily reference (1) variably displaced data within segments and/or (2) data beyond 4K bytes from the beginning of a segment.

Branch on Index (BRANX) -- provides an index increment, compare and branch function in a single instruction. This instruction is used to control the number of times a series of AP instructions will be executed. Since the instruction algebraically increments a register, BRANX can be used in conjunction with the Segment Indexing facility to simplify the processing of tables.

Execute (LEXEC) -- provides a function similar to the S/370 EXECUTE instruction. The amount of data logically OR'ed into the target instruction may be 2, 4 or 6 bytes.

Priority Dispatching -- provides the ability to specify the order in which 3601/2 workstations are dispatched. This function consists of the LCHAP instruction which activates or deactivates the dispatching priority specified in the table(s) generated by the PRIDSP macro.

Translate -- the LTRT instruction processes an input data stream against user specifiable translate table(s) to generate a translated output data stream. The LTRTBEG, LTRTENT and

LTRTGEN instructions assist the user application programmer in specifying the translate table(s).

Extended Statistical Counter Recording -- provides the option to enhance statistical counter recording facilities to assist in fault isolation of degraded loop segments. This facility is particularly useful when a loop consists of multiple remote locations.

Multiple Block I/O - Diskette -- permits multiple blocks to be accessed with a single execution of the LREAD and REPLACE instruction for permanent file and absolute addressing accesses. This may also result in enhanced performance when more than 3 blocks are read or 4 blocks are written.

3602 Dynamic Sector Relocate -- this facility provides a means of recovery when a Write Sector CRC check occurs. This facility, in most cases, replaces the off line manual procedure which requires a special test diskette to reassign failing sectors.

3270/3600 Datastream Mapping -- provides, via four new 3600 assembler language instructions, 3600 controller assistance in converting 3270 output datastreams into any output datastream processable by 3600 attached devices, and 3604 input datastreams into 3270 input datastreams. Additionally, these instructions can aid in converting 3604 output display datastreams into 3270 output display datastreams. Input and output screen sizes are supported as specified by the application programmer. The 3270 TAB, CLEAR, PA and PF keys are simulated.

Extended 3270/3600 Keyboard Mapping -- provides simulation of the 3270 INSERT, DELETE, ERASE TO END OF FIELD and ERASE INPUT keyboard functions.

IBM 3603 TERMINAL ATTACHMENT UNIT

Purpose: Attaches all 3600 System Controllers and terminals to the communication facilities. The 3603 enables remote subloop operation by connecting the controller loop feature to the communication facilities which connect to a remote 3603 with the sub-loop of terminals.

Model 1 Provides 1200 bps integrated circuitry for attachment to communication facilities and has switched network backup capability for use if the non-switched communication line fails.

Model 2 Provides an EIA RS232C interface to an external asynchronous modem (1200, 2400 bps).

Model Changes: Available at time of manufacture only.

Highlights: Can be physically installed on a wall ... has self test facilities to establish valid operation of the 3603 on a local loop exclusive of the non-switched network.

PREREQUISITES:

The 3603 mdl 2 with Clocking (#6352) requires a synchronous modem that accepts transmit signal element timing from the 3600 System equipment.

A 3601 or 3602 with an Additional Loop Feature (#4735) is required for each remote loop that is attached with a 3603.

As an alternate to a 3603, a 1200 BPS Loop Integrated Modem (#8001) in the 3601 or 3602 may be used.

Note: The loop is unidirectional. Therefore, if there is only one 3603 attached, there must be a four-wire duplex communication channel interconnecting the 3601/3602 and the 3603. If there is more than one 3603 location attached to a single loop, there must be a two-wire line linking all the 3603s in the loop, plus a two-wire line from the 3601/3602 to the first 3603 and from the last 3603 to the 3601/3602. The 3603 attaches to normal quality voice grade lines. When using a 3603 on a loop it is recommended that a 3603 be used at the 3601/3602 to maximize backup capabilities.

Bibliography: GC20-0370

Customer Responsibilities: The customer must be advised that: [1] He is responsible to make certain that the use of the equipment complies with all Federal, State, and Local Laws, Regulations, and Ordinances ... [2] He is responsible for price quotations, installation and cost (initial and recurring) of common carrier equipment and service ... [3] He is responsible for set up of the unit ... [4] The customer will determine the failing unit (see "Maintenance" below) ... [5] He is responsible to determine required spares ... [6] Purchaser agrees that IBM is relieved of responsibility for all claims including, but not limited to, loss of funds contained in, dispensed by or associated with the 3603.

The customer is also responsible for the provision of a telephone local loop conditioned for data above 300 bps, and for a CDT Access Arrangement in order to use the Switched Network Backup Function. A cable is available from IBM for a fee, for the DAA attachment. A similar cable is available, also for a fee, to connect the 3603 to the non-switched line connector. Installation of the cable is also a customer responsibility.

The IBM 3600 Finance Communication System Installation Manual - Physical Planning, GA27-2766, and the IBM 3600 Finance Communication System Financial Services Terminal - Terminal Installation Guide, GA27-2796, should be ordered for each customer installation.

Spares: The customer may wish to replace a failing 3603 with a spare and must be advised to purchase sufficient spare units for such use. The number of spare units recommended is dependent upon the number of units the customer has installed, his applications requirements, physical locations, and layouts. However, the minimum number of spare units recommended is shown in the following table:

Number of 3603s installed	Minimum Number of Spares Recommended	
	Model 1	Model 2
100	2	3
200	3	4
300	4	6
500	6	8
1000	10	14
1500	14	19
2000	17	24
2500	20	28
3000	23	33
3500	27	38
4000	30	42
4500	33	47
5000	36	51

Maintenance: Maintenance of the 3603 will normally be at a designated IBM Repair Center.

Customers with machines not under an IBM Maintenance Agreement have the option to ship the machines to the designated IBM Repair Center for repair under the *IBM Machine Repair Authorization Form, GX27-2981*, in which case repair will be made (if the machine is repairable). Alternatively, upon request, IBM will provide, for a minimum charge, an estimate of repair charges. This charge covers handling, inspection, cleaning, adjustments, testing, and estimating of repair charges.

IBM Repair Center Service: The repair service is available under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement at the MMMC shown below, or on a time and material basis.

Central Facility Maintenance: IBM will accept requests for special contracts for central facility maintenance (refer to Central Facility Maintenance in the Field Engineering Services subsection of the General Information section of the sales manual.) Under this offering, service will be performed at a repair facility located on customer premises. The customer will continue to be required to determine the failing unit and to transport it to and from the facility.

SPECIFY: Voltage (115 V AC, 1-phase, 60 Hz): #9901.

PRICES:	Mdl	ATP/ MLC	Purchase	MMMC
		5 Yr		
3603	1	\$ 25	\$720*	\$3.50
	2	24	675*	4.00

Plan Offering: Plan B
Warranty: B**
Termination Chg Months: 6
Upper Limit Percent: 5%

Purchase Option: 55%
Useful Life Category: 2
Termination Chg Percent: 20%

SPECIAL FEATURES

CLOCKING (#6352). [Model 2 only] Provides Transmit Signal Element Timing to synchronous modems (1200, 2400 bps). **Field Installation:** Not recommended.

Special Feature Prices:		ATP/ MLC	Purchase	MMMC
		5 Yr		
Clocking	#6352	\$3	\$100	\$.50

* Pilot Test Plan applies. PTP Purchase Option, 70%

** As specified in the IBM Repair Center Maintenance Supplement.



3604 KEYBOARD DISPLAY - Model 1

Purpose: A combination keyboard and gas-panel display terminal for input and output in interactive banking applications.

The 3604 mdl 1 displays 240 characters -- six rows of 40 characters. May have numeric and function keys.

Model Changes: Available at time of manufacture only.

Highlights: The 3604 displays up to 153 different characters under programmed control of a 3601 or 3602 Finance Communication Controller.

Has a variety of keyboards to meet input requirements ... see "Special Features."

Can be equipped to read a magnetic stripe on either a plastic card or a passbook and/or encode a magnetic stripe on a passbook.

May be either locally or remotely attached to the 3601 or 3602.

PREREQUISITES:

[1] An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.

[2] One keyboard type must be selected to complete the order ... see "Keyboards" under "Special Features."

Repair Center Maintenance: Available ...

Bibliography: GC20-0370

Specify: [1] Voltage (115 V AC, 1-phase, 60Hz): #9880 for locking plug, or #9881 for non-lock plug. **Field Installation:** Not recommended.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see Installation Manual - Physical Planning, GA27-2766.

[3] Numeric Engraving: For bottom row of engraved numeric keypad (from left to right) -- #9481 for zero, double-zero, triple-zero, #9482 for zero, double-zero, decimal point; or #9483 for zero, triple-zero, decimal point. See "Special Features." **Field Installation:** Not recommended.

[4] Function/Transaction Key Configuration: For the Function/Transaction keyboard to the right of the engraved numeric section -- #9181 if all individual keys, or #9182 if 3 bottom keys in leftmost column are to be replaced by a single raised "Motorbar" key. See "Special Features." **Field Installation:** Not recommended.

Prices:	Mdl	MAC/ MRC*	ETP/ MLC 2 Yr*	Purchase	MMMC	
	3604	1	\$ 62	\$ 53	\$1,695	\$10.50
		I	58**	49**	1,695**	7.00**

Plan Offering: Plan B Maintenance: D Per Call: 1
Purchase Option: 55% Useful Life Category: 2 Warranty: B
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES

KEYBOARDS -- all keyboards will have a combination of pre-engraved and non-engraved keytops. Each 3604 will be provided with 3 sets of self-adhesive keytop labels. One set will be pre-printed with commonly-used function nomenclature and will have a protective plastic coating applied. Also, a set of blank labels plus a set of clear plastic overlays for the blank labels will be provided so that the user may create his own labels.

Each keyboard will have an engraved numeric keypad consisting of 15 keys arranged in three columns of five rows. The bottom row of this section will be engraved as specified ... see item [3] under "Specify." The next three rows will be engraved with the digits 1 thru 9. The top row will contain three non-engraved function/transaction keys. All keyboards will also contain at least one function/transaction keypad consisting of non-engraved keys arranged in some number of columns which are 5 keys high.

NUMERIC KEYBOARD (#4661). A three-column function/transaction keypad to the right of an engraved numeric keypad. See items [3] and [4] under "Specify." **Maximum:** One. **Limitation:** Cannot be installed with Keyboard (#4663). **Field Installation:** Not recommended.

EXPANDED NUMERIC KEYBOARD (#4663). Same as #4661 plus an additional three-column function/transaction keypad to the left of the engraved numeric keypad. See items [3] and [4] under "Specify." **Maximum:** One. **Limitation:** Cannot be installed with Keyboard (#4661). **Field Installation:** Not recommended.

MAGNETIC STRIPE CAPABILITY -- The 3604 can be equipped with a Magnetic Stripe Reader or a Magnetic Stripe Encoder/Reader which mounts on top of the 3604. To use these features an operator manually passes a magnetic striped plastic identification card or credit card (for reading), or a passbook with a magnetic stripe label attached (for reading or encoding), through the slot. The 3604 encoding is in a unique format at 210 bits per inch. Standard ABA encoding is at 75 bits per inch; therefore, credit cards cannot be encoded to ABA specifications, and thus must be used as "read-only" documents. The 3604 is capable of reading either the standard ABA format or the 3604 passbook format. IBM self-adhesive magnetic stripe labels are available. These mylar base labels are approximately 0.50" (12.7 mm) by 3.6" (91.4 mm) and are easily applied by hand to passbooks.

MAGNETIC STRIPE READER (#4901). Has read capability only. **Maximum:** One. **Limitation:** Cannot be installed with Magnetic Stripe Encoder-Reader (#4905). **Field Installation:** Yes.

MAGNETIC STRIPE ENCODER-READER (#4905). Has encode and read capability. **Maximum:** One. **Limitation:** Cannot be installed with Magnetic Stripe Reader (#4901). **Field Installation:** Yes. **Prerequisite:** Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601 or 3602 ... see M 3601 or M 3602 pages.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 Yr	Purch	MMMC	
Numeric Keyboard	#4661	\$ 12*	\$ 10*	\$ 190	\$1.00
Expd Numeric Keyboard	4663	19*	16*	284	1.00
Magnetic Stripe Reader	4901	12*	10*	276	1.00
Magnetic Stripe Encoder-Reader	4905	31*	26*	430	2.50

* Effective July 1, 1977, orders for the 3604 mdl 1 will be accepted by IBM on a Purchase Only basis.
** Repair Center Maintenance Plan.

3604 KEYBOARD DISPLAY - Model 2

[The 3604 AAS Model Code 002 is no longer available. For New Orders for 3604 AAS Model Code A02, see "3604 Keyboard Display - Models 2, 3, 4". For special features for 3604 AAS Model Code 002, see "Special Features" below.]

Purpose: A combination keyboard and gas-panel display terminal for input and output in interactive banking applications.

The 3604 mdl 2 displays 240 characters -- six rows of 40 characters. May have alphanumeric, numeric, and function keys. May have an integrated modem.

Model Changes: Available at time of manufacture only.

Highlights: The 3604 displays up to 153 different characters under programmed control of a 3601 or 3602 Finance Communication Controller.

Has a variety of keyboards to meet input requirements ... see "Special Features."

Can be equipped to read a magnetic stripe on either a plastic card or a passbook and/or encode a magnetic stripe on a passbook.

May be either locally or remotely attached to a 3601 or 3602.

Prerequisites:

- [1] An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.
- [2] One keyboard type must be selected to complete the order ... see "Keyboards" under "Special Features."
- [3] If either the Numeric Keyboard (#4661) or the Expanded Numeric Keyboard (#4663) is ordered for a 3604 mdl 2, the 3604 mdl 2 must have the Line Feature Base (#4751) installed.

Repair Center Maintenance: Available ...

Bibliography: GC20-0370

Specify: [1] Voltage (115 V AC, 1-phase, 60Hz): #9880 for locking plug, or #9881 for non-lock plug. **Field Installation:** Not recommended.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see Installation Manual - Physical Planning, GA27-2766.

[3] Numeric Engraving: For bottom row of engraved numeric keypad (from left to right) -- #9481 for zero, double-zero, triple-zero; #9482 for zero, double-zero, decimal point; or #9483 for zero, triple-zero, decimal point. See "Special Features." **Field Installation:** Not recommended.

[4] Function/Transaction Key Configuration: For the Function/Transaction keyboard to the right of the engraved numeric section -- #9181 if all individual keys, or #9182 if 3 bottom keys in leftmost column are to be replaced by a single raised "Motorbar" key. See "Special Features." **NOTE:** Motorbar key is available on Numeric Keyboard (#4661) or Expanded Numeric Keyboard (#4663) or Expanded Alphanumeric Keyboard (#4664). It is not available with Alphanumeric Keyboard (#4662) therefore no Specify Code is required if #4662 is selected. **Field Installation:** Not recommended.

Prices:	MDL	AAS	MAC MRC	ETP/ MLC 2 Yr	Purchase	MMMC
3604	2	002	\$ 68	\$ 58	\$1,910	\$10.50
	2	002	63*	54*	1,910*	7.00*

Plan Offering: Plan B Maintenance: D
Per Call: 1 Purchase Option: 55% Warranty: B
Useful Life Category: 2 Termination Charge Months: 5
Termination Charge Percent: 25% Upper Limit Percent: 0%

SPECIAL FEATURES

The following special features apply to the 3604 AAS Model Code 002. For field installation, refer to feature description.

KEYBOARDS -- all keyboards will have a combination of pre-engraved and non-engraved keytops. Each 3604 will be provided with 3 sets of self-adhesive keytop labels. One set will be pre-printed with commonly-used function nomenclature and will have a

protective plastic coating applied. Also, a set of blank labels plus a set of clear plastic overlays for the blank labels will be provided so that the user may create his own labels.

Each keyboard will have an engraved numeric keypad consisting of 15 keys arranged in three columns of five rows. The bottom row of this section will be engraved as specified ... see item [3] under "Specify." The next three rows will be engraved with the digits 1 through 9. The top row will contain three non-engraved function/transaction keys. All keyboards will also contain at least one function/transaction keypad consisting of non-engraved keys arranged in some number of columns which are 5 keys high.

NUMERIC KEYBOARD (#4661). A three-column function/transaction keypad to the right of an engraved numeric keypad. See items [3] and [4] under "Specify." **Maximum:** One. **Limitation:** Cannot be installed with Keyboard (#4662, 4663, 4664). **Field Installation:** Not recommended.

ALPHANUMERIC KEYBOARD (#4662). An alphanumeric section pre-engraved as a typewriter keyboard to the left of an engraved numeric keypad plus a one-column function/transaction keypad to the right of the engraved numeric keypad. See item [4] under "Specify." **Maximum:** One. **Limitation:** Cannot be installed with Keyboard (#4661, 4663, 4664). **Field Installation:** Not recommended.

EXPANDED NUMERIC KEYBOARD (#4663). Same as #4661 plus an additional three-column function/transaction keypad to the left of the engraved numeric keypad. See items [3] and [4] under "Specify." **Maximum:** One. **Limitation:** Cannot be installed with Keyboard (#4661, 4662, 4664). **Field Installation:** Not recommended.

EXPANDED ALPHANUMERIC KEYBOARD (#4664). Same as #4662 except that function/transaction keypad is five columns wide. See items [3] and [4] under "Specify." **Maximum:** One. **Limitation:** Cannot be installed with Keyboard (#4661, 4662, 4663). **Field Installation:** Not recommended.

MAGNETIC STRIPE CAPABILITY -- see "Special Features" under 3604 Models 2, 3 and 4.

MAGNETIC STRIPE READER (#4901). Has read capability only. **Maximum:** One. **Limitation:** Cannot be installed with Magnetic Stripe Encoder-Reader (#4905). **Field Installation:** Yes.

MAGNETIC STRIPE ENCODER-READER (#4905). Has encode and read capability. **Maximum:** One. **Limitation:** Cannot be installed with Magnetic Stripe Reader (#4901). **Field Installation:** Yes. **Prerequisite:** Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601 or 3602 ... see M 3601 or M 3602 pages.

MODEMS -- one modem is required at each location which has 3600 Finance Communication System terminals remotely attached to the 3601 or 3602 Finance Communication Controller. The following features provide the required capability in the 3604 Keyboard Display mdl 2.

LINE FEATURE BASE (#4751). Required to operate the 1200 BPS Loop Integrated Modem (#8001) below. **Maximum:** One. **Limitation:** Only with #8001. **Field Installation:** Yes.

1200 BPS LOOP INTEGRATED MODEM (#8001). An integrated modem for communications with a remotely located 3601 or 3602 Finance Communication Controller. Operates at 1200 bps over unconditioned voice-grade lines. **Maximum:** One. **Limitation:** Not required if a 3614 at the same location has a 1200 bps integrated modem. **Field Installation:** Yes. **Prerequisites:** Line Feature Base (#4751) on the 3604, and a 1200 bps Loop Integrated Modem (#8001) on an Additional Loop Feature (#4735) on the 3601 or 3602 ... see M 3601 or M 3602 pages for further details.

Special Feature Prices:	MAC/ MRC	ETP/ MLC		MMMC
		2 Yr	Purch	
Numeric Keyboard #4661	\$ 12	\$ 10	\$ 190	\$1.00
Alphanumeric Keyboard 4662	25	21	381	1.00
Expnd Numeric Keyboard 4663	19	16	284	1.00
Expnd Alpha Keyboard 4664	31	26	466	1.50
Line Feature Base 4751	6	5	88	.50
Magnetic Stripe Reader 4901	12	10	276	1.00
Magnetic Stripe Encoder-Reader 4905	31	26	430	2.50
1200 BPS Loop Integrated-Modem 8001	19	16	500	2.50

* Repair Center Maintenance Plan.



3604 KEYBOARD DISPLAY - Models 2, 3 and 4

Purpose: A combination keyboard and gas-panel display terminal, for input and output in interactive banking applications, with a variety of screen sizes.

- Model 2** Displays 240 characters - six rows of 40 characters. May have alphanumeric, numeric and function keys. May have an integrated modem.
- Model 3** Displays 480 characters - twelve rows of 40 characters. May have numeric, alphanumeric and function keys. May have an integrated modem.
- Model 4** Displays 1024 characters - sixteen rows of 64 characters. May have numeric, alphanumeric and function keys. May have an integrated modem.

Model Changes: Available at time of manufacture only.

Highlights: The 3604 displays up to 153 different characters under programmed control of a 3601 or 3602 Finance Communication Controller.

Has a variety of keyboards to meet input requirements ... see "Special Features."

Can be equipped to read a magnetic stripe on either a plastic card or a passbook and/or encode a magnetic stripe on a passbook.

May be either locally or remotely attached to a 3601 or 3602.

Prerequisites:

- [1] An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 Keyboard Display mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.
- [2] One keyboard type must be selected to complete the order ... see "Keyboards" under "Special Features."

Repair Center Maintenance: Available for mdl A02

Bibliography: GC20-0370

Specify: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. **Field Installation:** Not recommended.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see Installation Manual - Physical Planning, GA27-2766.

[3] Numeric Engraving: For bottom row of engraved numeric keypad (from left to right) -- #9481 for zero, double-zero, triple-zero, #9482 for zero, double-zero, decimal point, or #9483 for zero, triple zero, decimal point. See "Special Features." **Field Installation:** Not recommended.

[4] Function/Transaction Key Configuration: For the Function/Transaction keyboard to the right of the engraved numeric section -- #9181 if all individual keys, or #9182 if 3 bottom keys in leftmost column are to be replaced by a single raised "Motorbar" key. See "Special Features." **Note:** Motorbar key is available on Numeric Keyboard (#4771), Expanded Numeric Keyboard (#4773), or Expanded Alphanumeric Keyboard (#4774). It is not available with Alphanumeric Keyboard (#4772), therefore no Specify Feature is required if #4772 is selected. **Field Installation:** Not recommended.

Prices:	Mdl	AAS	ATP/ MLC		
			5 Yr	Purchase*	MMMC
3604	2	A02	\$58	\$1,910	\$10.50
	2	A02	54**	1,910**	7.00**
	3		80	2,705	14.00
	4		82	2,760	17.00

Plan Offering: Plan B	Maintenance: D
Per Call: 1	Purchase Option: 55%
Warranty: B	Useful Life Category: 2
Termination Charge Months: 6	Termination Charge Percent: 20%
Upper Limit Percent: 5%	

* Pilot Test Plan applies. PTP Purchase Option: 70%
** Repair Center Maintenance Plan.

SPECIAL FEATURES

KEYBOARDS -- all keyboards will have a combination of pre-engraved and non-engraved keytops. Each 3604 will be provided with 3 sets of self-adhesive keytop labels. One set will be pre-printed with commonly-used function nomenclature and will have a protective plastic coating applied. Also, a set of blank labels will be provided so that the user may create his own labels.

Each keyboard will have an engraved numeric keypad consisting of 15 keys arranged in three columns of five rows. The bottom row of this section will be engraved as specified ... see item [3] under "Specify." The next three rows will be engraved with the digits 1 through 9. The top row will contain three non-engraved function/transaction keys. All keyboards will also contain at least one function/transaction keypad consisting of non-engraved keys arranged in some number of columns which are 5 keys high.

NUMERIC KEYBOARD (#4771). A three-column function/transaction keypad to the right of an engraved numeric keypad. See items [3] and [4] under "Specify." **Maximum:** One on mdl 2, 3 or 4. **Limitation:** Cannot be installed with Keyboard (#4772, 4773, 4774). **Field Installation:** Not recommended.

ALPHANUMERIC KEYBOARD (#4772). An alphanumeric section pre-engraved as a typewriter keyboard to the left of an engraved numeric keypad. See item [3] under "Specify." **Maximum:** One on mdl 2, 3 or 4. **Limitation:** Cannot be installed with Keyboard (#4771, 4773, 4774). **Field Installation:** Not recommended.

EXPANDED NUMERIC KEYBOARD (#4773). Same as #4771 plus an additional three-column function/transaction keypad to the left of the engraved numeric keypad. See items [3] and [4] under "Specify." **Maximum:** One on mdl 2, 3 or 4. **Limitation:** Cannot be installed with Keyboard (#4771, 4772, 4774). **Field Installation:** Not recommended.

EXPANDED ALPHANUMERIC KEYBOARD (#4774). Same as #4772 except that function/transaction keyboard is five columns wide. See items [3] and [4] under "Specify." **Maximum:** One on mdl 2, 3 or 4. **Limitation:** Cannot be installed with Keyboard (#4771, 4772, 4773). **Field Installation:** Not recommended.

MAGNETIC STRIPE CAPABILITY -- the 3604 can be equipped with a Magnetic Stripe Reader or a Magnetic Stripe Encoder/Reader which mounts on top of the 3604. To use these features, an operator manually passes a magnetic stripe plastic identification card or credit card (for reading), or a passbook with a magnetic stripe label attached (for reading or encoding), through a slot. The 3604 encoding is in a unique format at 210 bits per inch. Standard ABA encoding is at 75 bits per inch; therefore, credit cards cannot be encoded to ABA specifications, and thus must be used as "read-only" documents. The 3604 is capable of reading either the standard ABA format or the 3604 passbook format. IBM self-adhesive magnetic stripe labels are available

These mylar base labels are approximately 0.50" (12.7 mm) by 3.6" (91.4 mm) and are easily applied by hand to passbooks.

MAGNETIC STRIPE READER (#4902). Has read capability only. **Maximum:** One on mdl 2, 3 or 4. **Limitation:** Cannot be installed with Magnetic Stripe Encoder-Reader (#4906). **Field Installation:** Yes.

MAGNETIC STRIPE ENCODER-READER (#4906). Has encode and read capability. **Maximum:** One on mdl 2, 3 or 4. **Limitation:** Cannot be installed with Magnetic Stripe Reader (#4902). **Field Installation:** Yes. **Prerequisite:** Depending upon the configuration, the Additional Storage Feature (#1005 or 1006) may be required on the 3601, or Additional Storage Feature (#1006) may be required on the 3602 ... see 3601 or 3602.

MODEMS [Models 2, 3 and 4] -- one modem is required at each location which has 3600 Finance Communication System terminals remotely attached to the 3601 or 3602 Finance Communication Controller. The following features provide the required capability in the 3604 Keyboard Display mdl 2, 3 or 4.

LINE FEATURE BASE (#4752). Required to operate the 1200 BPS Loop Integrated Modem (#8002) below. **Maximum:** One on mdl 2, 3 or 4. **Limitation:** Only with #8002. **Field Installation:** Yes.

1200 BPS LOOP INTEGRATED MODEM (#8002). An integrated modem for communications with a remotely located 3601 or 3602 Finance Communication Controller. Operates at 1200 bps over unconditioned voice-grade lines. **Maximum:** One on mdl 2, 3 or 4. **Limitation:** Not required if a 3614 at the same location has a 1200 bps integrated modem. **Field Installation:** Yes. **Prerequisites:** Line Feature Base (#4752) on the 3604, and a 1200 bps Loop Integrated Modem (#8001) on an Additional Loop Feature (#4735) on the 3601 or 3602 ... see 3601 or 3602 for further details.



3604 Keyboard Display (cont'd)

Special Feature Prices:		ATP/ MLC 5 Yr	Purch	MMMC
Numeric Keyboard	#4771	\$10	\$190	\$1.00
Alphanumeric Keyboard	4772	21	381	1.00
Expd Numeric Keyboard	4773	16	284	1.00
Expd Alphanumeric Keybd	4774	26	466	1.50
Line Feature Base	4752	5	88	.50
Magnetic Stripe Reader	4902	10	276	1.00
Mag Stripe Encoder-Rdr	4906	26	430	2.50
1200 BPS Lp Intgd Mdm	8002	16	500	2.50

Prices:	Mdl	ATP/ MLC 5 Yr	Purchase*	MMMC
3604	5	\$ 60	\$1,450	\$11.50
	5	56**	1,450**	7.50**
	6	69	1,600	11.50
	6	65**	1,600**	7.50**

Plan Offering: Plan B Maintenance: D
Per Call: 1 Warranty: B
Purchase Option: 55% Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 20%
Upper Limit Percent: 5%

3604 KEYBOARD DISPLAY - Models 5 and 6

Purpose: A combination keyboard and gas-panel display terminal for input and output in interactive banking applications.

Model 5 Displays 120 characters - 3 rows of 40 characters. Included with the keyboard display is a 45-key keyboard, the keys of which may be designated by the customer to represent any numeric, alphabetic, or special character, or to represent a preprogrammed function.

Model 6 Displays 240 characters - 6 rows of 40 characters. The same 45-key keyboard is available as described above for the Model 5. Model 6 is also used as a control station terminal on a 3631/3632 Plant Communication Controller.

Highlights: The 3604 Keyboard Display mdl 5 displays characters using a 5 x 7 dot matrix. The 3604 mdl 6 displays characters using a 7 x 9 dot matrix.

A 45-key keyboard is standard. Can be equipped to read a magnetic stripe on either a plastic card or a passbook. Can be equipped with an audible alarm which is activated under program control. Dimensions are: 247.67 mm (9.75") high x 457.2 mm (18") wide x 190.5 mm (7.5") deep. May be either locally or remotely (see Prerequisites) attached to the 3601 or 3602.

Keyboard: The 45-key keyboard contains 3 clusters of 15 keys. The layout of each cluster is a matrix of 5 rows, with 3 keys in each row. The keyboard includes a blank overlay which may be designated with any notation the customer desires. A second overlay identifies the 10 numeric keys in a blue field, which may be placed in any of the three 15-key clusters the customer desires. Covering these overlays is a clear plastic, protective overlay. See M 10000 pages, 3600 Accessory Group, for pricing and ordering instructions for overlays.

Indicator Lights: Five indicator lights are provided, three of which can be lighted under program control.

PREREQUISITES: For a 3600 System: An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not. **Limitation:** When used as a control station terminal with a 3631 or 3632 Plant Communication Controller the use of the Keyboard, indicators, and the optional Audible Alarm (#1050) are modified.

Customer Set-up (CSU): The 3604 mdls 5 and 6 are designated as CSU machines effective July 8, 1979 ... see GI section for details. **Limitation:** The customer should complete the set-up and check out of the 3604 mdl 5 and 6 prior to calling the IBM CE to adjust the Audible Alarm feature (#1050). The Audible Alarm feature (#1050) requires tools and special skills for initial installation.

Repair Center Maintenance: Available

Bibliography: GC27-0370

Specify: [1] Voltage (AC, 1-phase, 115 V, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. **Field Installation:** Not recommended.

[2] Cables: For 3600 System, see M 10000 pages for prices and ordering instructions. Also see 3600 Installation Manual - Physical Planning, GA27-2766.

SPECIAL FEATURES

AUDIBLE ALARM (#1050). The 3604 mdl 5 or 6 can be equipped with an audible alarm which can be enabled or disabled under program control. The audible alarm can be programmed to work with any of the programmable indicator lights. **Maximum:** One. **Field Installation:** Yes.

MAGNETIC STRIPE CAPABILITY -- The 3604 model 5 and 6 can be equipped with a Magnetic Stripe Reader which is located in front of the display panel, to the left of the keyboard, or with a Magnetic Stripe Encoder-Reader attached by a 30 inch cable. To use these features, an operator manually passes a magnetic striped plastic identification card or credit card (for reading), or a passbook with a magnetic stripe label attached (for reading or encoding), through a slot. The 3604 encoding is in a unique format at 210 bits per inch. Standard ABA encoding is at 75 bits per inch; therefore, credit cards cannot be encoded to ABA specifications, and thus must be used as "read-only" documents. The 3604 is capable of reading either the standard ABA format or the 3604 passbook format. IBM self-adhesive magnetic stripe labels are available. These mylar base labels are approximately 12.7 mm (0.50") by 91.4 mm (3.6") and are easily applied by hand to passbooks.

MAGNETIC STRIPE ENCODER-READER (#1501). Has encode and read capability. **Maximum:** One on the Model 5 or 6. **Limitation:** Cannot be installed with Magnetic Stripe Reader (#4903). Cannot be used in a 3630 System. **Field Installation:** Yes. **Prerequisite:** Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or Additional Storage Feature (#1006) may be required on the 3602 ... see 3601 or 3602.

MAGNETIC STRIPE READER (#4903). Has read capability only. **Maximum:** One on the Model 5 or 6. **Limitation:** Cannot be installed with Magnetic Stripe Encoder-Reader (#1501). Cannot be used in a 3630 System. **Field Installation:** Yes.

Special Feature Prices:		ATP/ MLC 5 Yr	Purch	MMMC
Audible Alarm	#1050	\$ 6	\$ 114	\$.50
Magnetic Stripe Encoder-Reader	1501	28	460	2.50
Magnetic Stripe Reader	4903	6	200	2.00

* Pilot Test Plan applies. PTP Purchase Option, 70%
** Repair Center Maintenance Plan.

**IBM 3604 ADMINISTRATIVE KEYBOARD
DISPLAY - Model 7**

Purpose: A CRT display and keyboard terminal for administrative applications in a 3600 Finance Communication System.

Highlights: 1,920 characters are displayed in an 80 column x 24 row format.

Presents characters within a 7 x 14 character matrix. Displays 167 unique characters: 26 upper case alphabetic, 26 lower case alphabetic, 10 numeric and 105 special characters, in either normal or high intensity. By invoking the optional 3270/3600 Datastream Mapping facility and implementing the appropriate SNA/SDLC SLU-2 protocol interface in the associated controller, 3270 compatible host datastreams can be used. Field formatting capability, via 3270/3600 Datastream Mapping, permits individual fields to be program defined with various attributes such as protected/unprotected, alphameric, displayable/non-displayable, and high/normal intensity.

Keyboard: A 99-key keyboard, cable attached to the display enclosure, is standard. Keys are divided into four clusters: a typewriter arrangement, an adding machine arrangement, and two groups of 15 function keys. The tops of the typewriter and adding machine keys are engraved. Keys are defined by a translation table in the associated control unit.

Indicators: Both on-screen and discrete indicators are provided. The discrete indicators indicate loop synchronization, sweep and power status. Six on-screen graphic indicators are located at the bottom of the screen separate from the data area. Four are under the user's program control, while two ("Ready" and "Security Keylock Off") are under hardware control.

Operational Factors: The 3604 mdl 7 CRT is covered by a low-glare screen. On-screen indicators are easily viewed by the operator. Constant displays are maintained during the display refresh operation, eliminating blinking. Both underscore and reverse video cursors are available to the operator, as well as cursor blinking, under function key control. A "Clicker" is also under operator control to provide audible feedback when keying data. Any key up to a maximum of 16 keys (other than "Shift" or "Reset") can be designated as typamatic under program control.

Security Functions: A Security Keylock (see "Special Features") prevents keyboard entry or display of data in the terminal unless the key is turned to the "On" position.

Customer Setup: The 3604 mdl 7 is designated customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

CSU instructions is shipped with each 3604 mdl 7.

Customer Responsibilities: The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at the customer's receiving dock, unpacking and placement of the 3604 mdl 7.
- Physical setup, connection of cables in protected customer access areas, switch settings, and checkout.
- Contacting Field Engineering to make cable connections of IBM CSU units to non-CSU units where customer access areas are not provided.
- Notifying IBM of intent to relocate and following IBM instructions for relocation.
- Using and following the problem determination procedures and filling out the trouble report prior to calling for IBM service.
- Disconnecting, packing, and removal to the customer's shipping dock at time of discontinuance. Appropriate instructions will be provided by IBM.

Prerequisites:

1. An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614/3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4752) and an appropriate modem, or a 3604 with RPQ and an appropriate modem. If both a 3614/3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614/3624 since the Consumer Transaction Facility will often be operating when the 3604 mdl 2, 3 or 4 is not.
2. Depending upon the configuration, the Additional Storage Feature (#1005 or 1006) on the 3601 or the Additional Storage Feature (#1006) on the 3602 may be required ... see 3601 or 3602.

Bibliography: GC20-0370

SPECIFY

- **Voltage** (120 V AC, 1-phase, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug.
- **Cables:** See M 10000 pages for pricing and ordering instructions. Also see *Installation Manual - Physical Planning, GA27-2766*.
- **Power Cable:** If standard 2.8 meter (9 foot) power cable is not desired, specify -- #9511 for 1.8 meter (6 foot) cable, #9512 for 3.7 meter (12 foot), or #9513 for 4.5 meter (15 foot).
- **Numeric Keypad Zero Keys [Bottom Three Keys]**

Engraved Nomenclature:			
0	00	000	#9481
0	00	Decimal Pt	#9482
0	000	Decimal Pt	#9483

		MLC		
PRICES	Mdl	5 Yr	Purchase	MMMC
3604	7	\$110	\$2,800	\$23.50

Plan Offering: B Maintenance: D Per Call: 1
Purchase Option: 55% Warranty: B Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 20%
Upper Limit Percent: 5%
Pilot Test Plan Purchase Option: 70%

SPECIAL FEATURES

AUDIBLE ALARM (#1090). An alarm (short tone), sounded under program control, in conjunction with the programmable indicators, to alert the operator to special conditions. Adjustable volume. Alarm sounds when any of the four programmable indicators are set. **Maximum:** One. **Field Installation:** Yes.

SECURITY KEYLOCK (#6340). A physical keylock, located on the display enclosure, used to limit use of the terminal to authorized users. In the "secure" position, the display is blanked and the keyboard is disabled. **Maximum:** One. **Field Installation:** Yes.

		MLC		
		5 Yr	Purchase	MMMC
Audible Alarm	#1090	\$ 2	\$90	N/C
Security Keylock	6340	35SUC	35	N/C

		PILOT TEST	
		6 MOS.	3 MOS.
MDL/FEATURE	1	\$700	\$350
3604 Mdl 7	1	\$700	\$350
	#1090	23	12
	6340	Not Available	Not Available



3606 FINANCIAL SERVICES TERMINAL

Purpose: A keyboard display terminal for use with the 3600 Finance Communication System in point of sale or other applications.

Model 1 - Attaches to the 3601 or 3602 Finance Communication Controller local or remote loop. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem.

Model 2 - Attaches to the 3601 or 3602 Finance Communication Controller remote loop.

Model Changes: Available at time of manufacture only.

Highlights: Has 8 position numeric display, 9 message indicators, a numeric keyboard, 6 function keys and a magnetic stripe reader capable of reading either standard ABA format (75 bpi) or the 3604 passbook format (210 bpi).

Used as an interactive terminal in point of sale and other applications [credit authorization, data capture, check verification, funds transfer(s)].

PREREQUISITES:

Model 1 - If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 and 4 is not.

Model 2 - common carrier termination at location of installation.

Bibliography: GC20-0370

Customer Responsibilities: The customer must be advised that: [1] He is responsible to make certain that the use of the equipment complies with all Federal, State, and Local Laws, Regulations, and Ordinances ... [2] He is responsible for price quotations, installation and cost (initial and recurring) of common carrier equipment and service ... [3] He is responsible for the set-up of the unit ... [4] The customer will determine the failing unit (see "Maintenance" below) ... [5] He is responsible to determine required spares ... [6] Purchaser agrees that IBM is relieved of responsibility for all claims including, but not limited to, loss of funds contained in, dispensed by or associated with the 3606.

Spares: The customer may wish to replace a failing 3606 with a spare and must be advised to purchase sufficient spare units by model for such use. The number of spare units recommended is dependent upon the number of units the customer has installed, his application requirements, physical locations, and layouts. However, the minimum number of spare units recommended is shown in the following table:

Number of 3606s Installed	Minimum Number of Spares Recommended	
	Model 1	Model 2
100	2	2
200	3	4
300	4	5
500	5	6
1000	8	10
1500	11	14
2000	14	18
2500	16	21
3000	19	25
3500	21	28
4000	24	31
4500	26	34
5000	29	37

Maintenance: All maintenance of the 3606, parts replacement, and repair shall normally be performed at the designated IBM Repair Center.

Customers with machines not under an IBM Maintenance Agreement have the option to ship the machines to the designated IBM Repair Center for repair under the *IBM Machine Repair Authorization Form, GX27-2981*, in which case repair will be made (if the machine is repairable). Alternatively, upon request, IBM will provide, for a minimum charge, an estimate of repair charges. This charge covers handling, inspection, cleaning, adjustments, testing, and estimating of repair charges.

IBM Repair Center Service: Th repair service is available under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement at the MMMC shown below, or on a time and material basis.

Central Facility Maintenance: IBM will accept requests for special contracts for central facility maintenance

Under this offering, service will be performed at a repair facility located on customer premises. The customer will continue to be required to determine the failing unit and to transport it to and from the facility.

Specify: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9901.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see *Installation Manual - Physical Planning, GA27-2766*.

[3] Terminals are shipped with standard keyboard and indicator light nomenclature unless specified as follows: #9031 -- for a blank filter panel, or #9481 -- for a numerics-only keyboard overlay. The customer may choose the nomenclature to suit an application. See *Financial Services Terminals Complementing Manual, GC27-0002*. All keyboard overlays and filter panels are also available for a fee. See "3600 Accessories" in M 10000 pages for pricing and ordering instructions.

[4] Keyboard Arrangement: Specify #9390 for a reverse or calculator formatted keyboard (top row -- 7, 8, 9; second row -- 4, 5, 6; third row -- 1, 2, 3; 0 in bottom row.) if #9390 is not specified, the standard keyboard arrangement will be shipped (top row -- 1, 2, 3; second row -- 4, 5, 6; third row -- 7, 8, 9; 0 in bottom row). Field Installation: Not recommended.

Prices:	Mdl	ATP/ MLC 5 Yr	Purchase	MMMC
3606	1	\$ 26	\$ 800*	\$ 5.00
	2	\$ 39	1,125*	8.50

Plan Offering: Plan B
Purchase Option: 55%
Termination Chg Mnths: 6
Upper Limit Percent: 5%

Warranty: B**
Useful Life Category: 2
Termination Chg Percent: 20%

* Pilot Test Plan applies. PTP Purchase Option,70%.
** As specified in the IBM Repair Center Maintenance Supplement.

3608 PRINTING FINANCIAL SERVICES TERMINAL

Purpose: A keyboard display terminal, with printer, for use with the 3600 Finance Communication System in point of sale or other applications.

Model 1 Attaches to the 3601 or 3602 Finance Communication Controller local or remote loop. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and an appropriate modem.

Model 2 Attaches to the 3601 or 3602 Finance Communication Controller remote loop.

Model Changes: Available at time of manufacture only.

Highlights:

- Can print three lines of alphanumeric data on sales slips, charge receipts, or other documents used in point of sale applications. Line positions must be specified ... see "Specify."
- Has 45 character set. Optional 10 character numeric OCR 7B font for uppermost print row is available as a special feature ... see "Special Features."
- Document to be printed is inserted into the chute at the right of the terminal, is fed past print wheels, printed, and ejected at the left side of the terminal.
- Has 8 position numeric display, 9 message indicators, a numeric keyboard, 6 function keys, and a magnetic stripe reader capable of reading either standard ABA format (75 bpi) or the 3604 passbook format (210 bpi).
- Used as an interactive terminal in point of sale and other applications (credit authorization, data capture, check verification, funds transfers).

Prerequisites:

Model 1 -- if located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 model 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 model 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 model 2, 3 or 4 is not.

Model 2 - common carrier termination at location of installation.

Bibliography: GC20-0370

Customer Responsibilities: The customer must be advised that: [1] He is responsible to make certain that the use of the equipment complies with all Federal, State, and Local Laws, Regulations, and Ordinances ... [2] He is responsible for price quotations, installation and cost (initial and recurring) of common carrier equipment and service ... [3] He is responsible for set-up of the unit ... [4] The customer will determine the failing unit (see "Maintenance" below) ... [5] He is responsible to determine required spares ... [6] Purchaser agrees that IBM is relieved of responsibility for all claims including, but not limited to, loss of funds associated with the 3608.

Spares: The customer may wish to replace a failing 3608 with a spare and must be advised to purchase sufficient spare units by model for such use. The number of spare units recommended is dependent upon the number of units the customer has installed, his application requirements, and layouts. However, the minimum number of spare units recommended is shown in the following table:

Number of 3608s Installed	Minimum Number of Spares Recommended	
	Model 1	Model 2
100	5	5
200	8	9
300	11	12
500	16	17
1000	27	30
1500	38	43
2000	49	55
2500	59	67
3000	70	78
3500	80	90
4000	90	102
4500	100	113
5000	110	124

Maintenance: All maintenance of the 3608, parts replacement, adjustments, and repair shall normally be performed at the designated IBM Repair Center.

Customers with machines not under an IBM Maintenance Agreement have the option to ship the machines to the designated IBM Repair Center for repair under the *IBM Machine Repair Authorization Form, GX27-2981*, in which case repair will be made (if the machine is repairable). Alternatively, upon request, IBM will provide, for a minimum charge, an estimate of repair charges. This charge covers handling, inspection, cleaning, adjustments, testing, and estimating of repair charges.

IBM Repair Center Service: The repair service is available under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement at the MMC shown below, or on a time and material basis.

Central Facility Maintenance: IBM will accept requests for special contracts for central facility maintenance

Under this offering, service will be performed at a repair facility located on customer premises. The customer will continue to be required to determine the failing unit and to transport it to and from the facility.

Forms Characteristics: Printing on the standard 3608 is possible on single part forms of the following dimensions; From 69.9mm (2.75") up to 82.6mm (3.25") high by 147.3mm (5.8") to 215.9mm (8.5") wide by 0.10mm (.004") to 0.28mm (.011") thick. In addition, the following dimensions apply to multi-part charge forms: 82.6mm (3.25") high by 121.9mm (4.8") to 215.9mm (8.5") wide by 0.18mm (.007") to 0.43mm (0.017") thick. Refer to the *IBM Forms Design Reference Guide for Printers, GA24-3488* for additional information. OCR 7B (not inked) printing is intended for two and three part charge forms. Due to variations in card, paper, and carbon stock, the customer should evaluate his printed forms to determine if they meet his performance objectives. An optional feature that allows printing of documents up to 88.9mm (3.5") in height is available ... see #9701 under "Specify."

Character Sets:

OCR is 0-9

10-pitch is 0-9, A-Z, and special characters number sign (#), at sign (@), comma (,), minus (-), dollar (\$), period (.), ampersand (&), slash (/), and percent sign (%).

Specify: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9901.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see *Installation Manual - Physical Planning, GA27-2766*.

[3] Terminals are shipped with standard keyboard and indicator light nomenclature unless specified as follows: Specify #9031 -- for blank filter panel ... or #9481 for a numerics-only keyboard overlay. The customer may choose the nomenclature to suit an application. See *Financial Services Terminals Complementing Manual, GC27-0002*. All keyboard overlays and filter panels are also available for a fee. See "3600 Accessories" in M 10000 pages for pricing and ordering instructions.

[4] Print Line Positions [at time of manufacture only]: The following are standard combinations ... see Line Position Chart A.

- #9540 for 1, 4, 10
- #9541 for 1, 5, 10
- #9542 for 1, 3, 6
- #9543 for 1, 7, 10
- #9544 for 4, 7, 10



3608 Printing Financial Services Terminal (cont'd)

[5] Keyboard Arrangement: Specify #9390 for a reverse or calculator formatted keyboard (top row -- 7, 8, 9; second row -- 4, 5, 6; third row -- 1, 2, 3; 0 in bottom row.) If #9390 is not specified, the standard keyboard arrangement will be shipped (top row -- 1, 2, 3; second row -- 4, 5, 6; third row -- 7, 8, 9; 0 in bottom row). Field Installation: Not recommended.

[6] Document Chute: #9701 ... for a document chute capable of handling documents up to 88.9mm (3.5') in height. This feature shifts the print line positions up so that the distance from the bottom of the form to the nominal center location of the print line is increased by 3.5mm (.125"). It is only available with 4, 7, 10 print line positions (#9544) ... see Line Position Chart B. It is not available with OCR 7B Font (#5454). Field Installation: Available at time of manufacture only.

Line Position Chart A [Standard 82.6mm (3.25") Chute]

Line Pos.	Font	Nominal Center Line Location, distance from bottom edge of document	Note
		77.0mm (3.031")	
		5.56mm (.219") from top edge of 82.6mm (3.25") document	Available as Special Feature (#5454) only
1	10-pitch	77.0mm (3.031")	Not with #5454
2	10-pitch	71.9mm (2.831")	Not with #5454
3	10-pitch	66.8mm (2.631")	
4	10-pitch	61.7mm (2.431")	
5	10-pitch	56.7mm (2.231")	
6	10-pitch	51.6mm (2.031")	
7	10-pitch	46.5mm (1.831")	
8	10-pitch	41.4mm (1.631")	
9	10-pitch	36.3mm (1.431")	
10	10-pitch	31.3mm (1.231")	
11	10-pitch	26.2mm (1.031")	Only with #5454
12	10-pitch	21.1mm (0.831")	Only with #5454

Line Position Chart B [88.9mm (3.5') chute only ... see #9701 above]

Line Pos	Font	Nominal Center Line Location, distance from bottom edge of document
4	10-pitch	64.9mm (2.556")
7	10-pitch	49.7mm (1.956")
10	10-pitch	34.4mm (1.356")

Prices:	Mdl	ATP/ MLC 5 Yr	Purchase	MMMC
3608	1	\$ 59	\$1,900*	\$ 9.00
	2	\$ 72	\$2,225*	\$ 12.50

Plan Offering: Plan B Purchase Option: 55%
Warranty: B** Useful Life Category: 2
Termination Chg Mnths: 6 Termination Chg Percent: 20%
Upper Limit Percent: 5%

SPECIAL FEATURES

OCR 7B FONT (#5454). The 10-character OCR 7B font can be substituted for the standard font in the uppermost print row. The 3 print line positions, when this feature is installed, are OCR, 3 and 5. The OCR 7B characters impact printed when #5454 is used can be read on a 1287 Optical Character Reader equipped with OCR 7B special feature (#3945). **Field Installation:** Available at time of manufacture only.

Special Feature Prices:		ATP/ MLC 5 Yr	Purchase	MMMC
OCR 7B Font	#5454	\$ 3	\$ 115	NC

* Pilot Test applies: PTP Option Percent, 70%

** As specified in the IBM Repair Center Maintenance Supplement.

3610 DOCUMENT PRINTER - Model 1, 2, 3

Purpose: A printer for use with the 3600 Finance Communication System to provide a hard-copy output of banking transactions.

- Model 1** Prints on a cut form.
- Model 2** Prints on a cut form and on a journal/audit roll.
- Model 3** Prints on a cut form and on continuous fanfold paper.

Model Changes: Available at time of manufacture only.

Highlights: The 3610 printer provides for a hard-copy output on a variety of cut forms and paper stock to meet the customer's printing requirement in banking applications. When combined with a 3604 Keyboard Display, the 3610 provides a bank teller with a work station to use in performing banking transactions. The 3610 printer can also be used alone for administrative printing of required reports. A document-handling device provides the capability to print on cut forms. The forms can be those usually used for printing of one line or a number of lines. When a single-line document is used, a lever is provided to engage a document stop which positions the center line of the printed line 13/16" ± 1/16" (20.6 mm ± 1.6 mm) from the bottom of the document. The lever is disengaged when the teller wishes to insert the document further into the printer. Printing occurs at 10 characters/inch and 5 or 6 lines/inch. At time of installation, the FE Customer Engineer will set line spacing at 5 LPI or 6 LPI as requested by the customer. Speed ranges from 15 cps to 30 cps ... see "Special Features."

- Model 1** -- has the capability of printing single or multiple lines on a cut form inserted in the document chute.
- Model 2** -- has the capability of printing on a one-part or two-part journal roll, which can be used to maintain an audit trail of banking transactions. A cut form can be positioned in front of the journal so that printing can occur simultaneously on the cut form and journal roll, provided that appropriate carbon or impact paper is used.
- Model 3** -- contains a pin feed platen assembly which allows printing to occur on continuous fanfold paper stock. A cut form can be placed in front of the continuous form so that printing can occur simultaneously on both documents with the appropriate carbon or impact paper.

PREREQUISITES:

- [1] An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.
- [2] Selection of print speed ... see "Special Features."
- [3] Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see M 3601 or M 3602 pages.

Forms Specification: Refer to *Form Design Reference Guide for Printers, GA24-3488*.

Bibliography: GC20-0370

Specify: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. **Field Installation:** Not recommended.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see Installation Manual - Physical Planning, GA27-2766.

* Orders for the 3610 mdl 2 will be accepted by IBM on a Purchase Only basis.

** Pilot Test applies: PTP Option Percent, 70%

†† MMMC price effective July 1, 1979.

3610 Model 2

Prices:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
	2	\$ 75*	\$ 64*	\$2,165	\$13.00††

3610 Models 1 and 3 (for billing purposes only)

Prices:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
	1	\$ 68	\$ 58	\$1,980	\$11.50††
	3	94	80	2,545	22.50††

(for new orders, see below)

Prices:	Mdl	ATP/ MLC 5 Yr	Purchase**	MMMC
	1	\$ 58	\$1,980	\$11.50††
	3	80	2,545	22.50††

Plan Offering: Plan B Purchase Option: 55% Maintenance: D
Per Call: 1 Warranty: B Useful Life Category: 2
ETP: Termination Chg Mnths: 5 Termination Chg Percent: 25%
ATP: Termination Chg Mnths: 6 Termination Chg Percent: 20%
ATP: Upper Limit Percent: 5% ETP: Upper Limit Percent: 0%

SPECIAL FEATURES

JOURNAL TAKEUP WITH LOCKED COVER (#4651). [Mdl 2 only] Provides a takeup roll on which the printed journal can be taken up after it has been printed. If two-part paper is used, one part may be put on the takeup roll, and the original can exit past a tear bar. A locked cover is also provided over the takeup roll to prevent unauthorized access to the journal roll. Two keys are provided. **Maximum:** One. **Field Installation:** Yes.

SHARED TERMINAL (#6350). Provides two pushbuttons each labeled, START PRINT. These pushbuttons provide teller identification to the 3601 or 3602 Finance Communication Controller when two tellers are sharing one printer. **Maximum:** One. **Field Installation:** Yes.

***** 15 CPS WITH 64 CHARACTER SET (#6900, #6903).** [#6900 for mdl 2 ... #6903 for mdl 1 and 3] Provides a 64 character set consisting of 63 printable graphics and space (blank). **Maximum:** One. **Limitation:** Cannot be installed with #6901 or #6904. **Field Installation:** Available at time of manufacture only.

***** UP TO 30 CPS WITH 96 CHARACTER SET (#6901, #6904).** [#6901 for mdl 2 ... #6904 for mdl 1 and 3] Provides a 96 character set consisting of 95 printable graphics and space (blank). **Field Installation:** Available at time of manufacture only. **Maximum:** One. **Limitation:** Cannot be installed with #6900 or #6903.

******* Either #6900 or #6901, or #6903 or #6904 must be selected to complete the machine order.

Special Feature Prices:

3610 mdl 2 (and mdls 1 and 3 for billing purposes only)

		MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
Journal Takeup with Locked Cover	#4651	\$ 6*	5*	\$ 170	\$1.00
Shared Terminal	6350	27SUC	—	27	NC
15 CPS w 64 Char Set	6900	19*	16*	509	6.00††
Up to 30 CPS with 96 Character Set	6901	31*	26*	848	10.00††

3610 mdls 1 and 3 - for new orders

		ATP/ MLC 5 Yr	Purchase	MMMC
Shared Terminal	#6350	\$27SUC	\$ 27	NC
15 CPS w 64 Char Set	6903	16	509	\$6.00††
Up to 30 CPS with 96 Character Set	6904	26	848	10.00††

Accessories: The following item is available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND (#4450). -- mdl 3 only -- permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

3610 DOCUMENT PRINTER - Model 4

SPECIAL FEATURES

Purpose: A printer for use with the 3600 Finance Communication System to provide a hardcopy output of banking transactions. The 3610 mdl 4 prints on a cut form and on a journal roll/audit roll.

SHARED TERMINAL (#6350). Provides two pushbuttons for teller identification to the 3601/3602 Finance Communication Controller when two tellers are sharing one printer. **Maximum: One.** **Limitation:** Cannot be installed with the Address Sharing RPQ (MG1586). **Field Installation:** Yes.

Model Changes: Available at time of manufacture only.

Highlights: The 3610 Document Printer mdl 4 provides a hardcopy output on a variety of cut forms and paper stock to meet the customer's printing requirements in banking applications. In addition, the 3610 mdl 4 has the capability of printing single or multiple lines as well as being able to print on a one or two part journal roll. When a single line document is used, a lever is provided to engage a document stop which positions the center of the printed line .812" ± .062" (20.625 ± 1.575 mm) from the bottom of the document. A cut form can be positioned in front of the journal roll so that printing can occur simultaneously on the cut form and journal roll, provided that appropriate carbon or impact paper is used.

	ATP/ MLC	Purchase	MMC
Shared Terminal	#6350	\$ 27SUC	\$ 27 NC

Printing occurs at 10 characters per inch, and 5 or 6 lines per inch. At time of installation the customer engineer will set the line spacing at 5 or 6 lines per inch as requested by the customer. The 3610 mdl 4 prints at speeds up to 30 characters/sec. Forms control capabilities include a right-hand forms-advance knob, and a forms tear bar located 2.625" ± .25" (66.675 mm ± 6.35 mm) above the print line. When one part of the journal paper is attached to the take-up roll, the forms-advance knob may be used to advance the paper. Otherwise, the paper must be advanced manually.

The size of the 3610 mdl 4 is 10.5" (266.7 mm) high x 18.0" (457.2 mm) wide x 10.5" (266.7 mm) deep. When used with the 3604 Keyboard Display mdl 5 or 6 it provides a teller with a work station which fits within a work area with dimensions of 10.5" (266.7 mm) high x 18.0" (457.2 mm) wide x 18.0" (457.2 mm) deep.

Journal Take-up With Locked Cover -- provides a journal take-up roll for accumulating one part of a two-part journal after it is printed. (The other part of the journal exits from the printer past a tear bar.) A locked cover is also provided to prevent unauthorized access to the take-up roll. Two keys are provided for the lock. the journal take-up roll can accommodate only up to a maximum of 15.24M (50 feet) of paper.

48 Character Set -- provides a 48 character set consisting of 47 printable graphics and space (blank).

PREREQUISITES: (1) An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624, since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.

(2) Depending upon the configuration, the Additional Storage Feature (#1005/1006) may be required on the 3601/3602 ... see 3601/3602.

Bibliography: GC20-0370

Forms Specifications: Refer to *Form Design Reference Guide for Printers, GA24-3488.*

Specify: [1] Voltage (115 VAC, 1-phase, 60 Hz): **#9880** for locking plug, or **#9881** for non-lock plug. **Field Installation:** Not recommended.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see *3600 Installation Manual - Physical Planning, GA27-2766.*

Prices:	Mdl	ATP/ MLC 5 Yr	Purchase**	MMC
3610	4	\$ 90	\$ 2,000	\$ 21.50

Plan Offering: Plan B
Per Call: 1
Warranty: B
Termination Charge Months: 6
Upper Limit Percent: 5%

Maintenance: D
Purchase Option: 55%
Useful Life Category: 2
Termination Charge Percent: 20%

** Pilot Test Plan applies. PTP Purchase Option, 70%



IBM 3611 PASSBOOK PRINTER

Purpose: A printer used in the 3600 Finance Communication System to print on horizontal fold or vertical fold passbooks or on single or multiple part cut forms.

Model 1 No longer available

Model 2 Prints on passbooks and cut forms.

Model Changes: Not recommended for field installation.

Highlights: The 3611 printer provides the capability of printing on a variety of passbooks and forms to meet customer's requirements in banking applications.

The 3611 is a physically compact unit with a flat top suited for placement of a 3604 Keyboard display. When combined with a 3604, the 3611 provides a high function work station in a limited amount of space.

Passbook specifications for both models are the same as for the 3612 passbook printers. Passbook and forms printing occurs at 12 characters/inch and may be at 5 or 6 lines/inch, with up to an 8.3 inch (211 mm) print line of 100 characters.

Model 2 - prints on a horizontal fold or a vertical fold passbook. Variable size, single or multipart documents can be printed in the passbook chute. The size of document which can be accommodated is determined by the width of the passbook to which the passbook chute is adjusted. The maximum document width is equal to 1/2 the passbook width plus 4.35" (110 mm).

PREREQUISITES:

- [1] An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.

- [2] Selection of print speed ... see "Special Features."

- [3] Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see M 3601 or M 3602 pages.

Forms Specifications: Refer to Form Design Reference Guide for Printers, GA24-3488.

Bibliography: GC20-0370

Specify: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. **Field Installation:** Not recommended.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see Installation Manual - Physical Planning, GA27-2766.

[3] Short Page Passbooks: #9650 - provides a passbook stop position for passbooks with short pages, cutouts, notches or windows. Optional stop position required when the distance between the edge of the short pages, cutouts, notches or windows and the leading edge of the passbook cover is between .360" (9.14 mm) and .657" (16.7 mm). **Field Installation:** Not recommended.

Prices: For Model 2 for billing purposes only

3611	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
	2	\$119	\$101	\$3,030	\$20.00

For Model 2 - New Orders

Mdl	MAC/ MRC	ATP/ MLC 5 Yr	Purchase**	MMMC
2	\$119	\$101	\$3,030	\$20.00

Plan Offering: Plan B Machine Group: D
 Per Call: 1 Purchase Option: 55%
 Useful Life Category: 2 Warranty: B
 ETP: Termination Chg Mnths: 5 Termination Chg Percent: 25%
 ATP: Termination Chg Mnths: 6 Termination Chg Percent: 20%

SPECIAL FEATURES

SHARED TERMINAL (#6350). Provides two pushbuttons, labelled START PRINT. These pushbuttons provide teller identification to the 3601 or 3602 Finance Communication Controller when two tellers are sharing one printer. **Maximum:** One. **Field Installation:** Yes.

***** 15 CPS WITH 64 CHARACTER SET (#6900, #6903).** [#6900 -- for billing purposes only on mdl 2 ... #6903 -- for mdl 2, new orders] Provides a 64 character set consisting of 63 printable graphics and space (blank). **Maximum:** One. **Limitation:** Cannot be installed with #6901 or #6904. **Field Installation:** Available at time of manufacture only.

***** UP TO 30 CPS WITH 96 CHARACTER SET (#6901, #6904).** [#6901 -- for billing purposes only on mdl 2 ... #6904 -- for mdl 2, new orders] Provides a 96 character set consisting of 95 printable graphics and space (blank). **Maximum:** One. **Limitation:** Cannot be installed with #6900 or #6903. **Field Installation:** Available at time of manufacture only.

***** Either #6900 or #6901, or #6903 or #6904 must be selected to complete the machine order.**

Special Feature Prices:

3611 Mdl 1 (and Mdl 2 for billing purposes only)

		MAC/ MRC	ETP/ MLC 2 Yr	Purch	MMMC
Shared Terminal	#6350\$	27SUC	-	\$ 27	NC
15 CPS w 64 Char Set	6900	19	\$ 16	509	\$13.00
Up to 30 CPS w 96 Character Set	6901	31	26	848	17.50

3611 Mdl 2 - for new orders

		MAC/ MRC	ATP/ MLC 5 YR	Purchase	MMMC
Shared Terminal	#6350\$	27SUC	-	\$ 27	NC
15 CPS w 64 Char Set	6903	19	16	509	\$13.00
Up to 30 CPS w 96 Character Set	6904	31	26	848	17.50

** Pilot Test Plan applies. PTP Purchase Option, 70%.



IBM 3612 PASSBOOK AND DOCUMENT PRINTER

Purpose: A printer used in the 3600 Finance Communication System to print on a variety of forms, documents, and passbooks.

- Model 1** Prints on a horizontal-fold or vertical-fold passbook and on a cut form.
- Model 2** Prints on a horizontal-fold or vertical-fold passbook, on a cut form, and on a journal/audit roll.
- Model 3** Prints on a horizontal-fold or vertical-fold passbook, on a cut form, and on continuous fanfold paper.

Model Changes: Available at time of manufacture only.

Highlights: The 3612 printer provides the capability of printing on a variety of forms and passbooks to meet the customer's requirements in banking applications. This printer, when combined with a 3604 Keyboard Display, provides a full-function work station for handling the wide range of banking transactions through the incorporation of two independent print mechanisms. A document-handling device provides the capability to print on cut forms. The forms can be those usually used for printing of one line or a number of lines. When a single-line document is used, a lever is provided to engage a document stop which positions the center line of the printed line 13/16 ± 1/16 inch (20.6 ± 1.6 mm) from the bottom of the document. The lever is disengaged when the customer wishes to insert the document further into the printer. Passbooks are inserted in the bottom half of the printer while cut forms/documents may be inserted in the top half. With this facility, the printer is able to print on the passbook and print on the cut forms. Forms printing occurs at 10 characters per inch and 5 or 6 lines per inch. A maximum of 80 characters may be printed across an 8 inch (200 mm) line. The capability to print a single line on a document that is inserted in the cut form chute is provided. Passbook printing occurs at 12 characters per inch and 5 or 6 lines per inch with up to an 8.3 inch (211 mm) print line of 100 characters. At time of installation, the FE Customer Engineer will set line spacing to 5 LPI or 6 LPI as requested by the customer.

NOTE: Only one print element (either passbook or cut form) prints at a time. Both must be selected with the same print speed.

Model 1 -- prints on a passbook and has the capability of printing single or multiple lines on a document inserted in the document chute.

Model 2 -- prints on a passbook and has the capability of printing on a one-part or two-part journal roll, which can be used to maintain an audit trail of bank transactions. A cut form can be positioned in front of the journal so that printing can occur simultaneously on the cut form and journal roll, provided that appropriate carbon or impact paper is used.

Model 3 -- prints on a passbook and contains a pin feed platen assembly that allows printing to occur on continuous fanfold paper stock. A cut form can be placed in front of the continuous form so that printing can occur simultaneously on both documents with the appropriate carbon or impact paper.

NOTE: Passbook unit (as opposed to forms printing unit) is 12 pitch with an 8.3 inch (211 mm) print line of 100 characters for all models.

PREREQUISITES:

- [1] An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 md 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.
- [2] Selection of print speed ... see "Special Features."
- [3] Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see M 3601 or M 3602 pages.

Forms Specifications: Refer to Form Design Reference Guide For Printers, GA24-3488.

Bibliography: GC20-0370

Specify: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. **Field Installation:** Not recommended.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see Installation Manual - Physical Planning, GA27-2766.

[3] Short Page Passbooks: #9650 -- provides a passbook stop position for passbooks with short pages, cutouts, notches, or windows. Optional stop position required when the distance between the edge of short pages, etc., and the leading edge of the passbook cover is between .360 inches (9.14 mm) and .657 inches (16.7 mm). **Field Installation:** Not recommended.

Prices: - 3612

Model 1	Mdl	AAS	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
	1	001	\$106**	\$ 90**	\$2,885	\$16.00

Model 2 and 3 (for billing purposes only)

	Mdl	AAS	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
	2	002	\$112	\$ 95	\$3,050	\$16.00
	3	003	137	117	3,390	30.50

(for New Orders)

	Mdl	AAS	MAC/ MRC	ATP/ MLC 5 Yr	Purchase*	MMMC
	2	A02	\$112	\$ 95	\$3,050	\$16.00
	3	A03	137	117	3,390	30.50

Plan Offering: Plan B Machine Group: D
 Per Call: 1 Purchase Option: 55%
 Warranty: B Useful Life Category: 2
 ETP: Termination Chg Mnths: 5 Termination Chg Percent: 25%
 ATP: Termination Chg Mnths: 6 Termination Chg Percent: 20%
 ETP: Upper Limit Percent: 0% ATP: Upper Limit Percent: 5%

SPECIAL FEATURES

JOURNAL TAKEUP WITH LOCKED COVER (#4651, #4652).

[Mdl 2 only] [#4651 -- for 3612 AAS Model Code 002 ... #4652 -- for 3612 AAS Model Code A02] Provides a paper roll on which one or both parts of the printed journal can be taken up after it has been printed. If two-part journal paper is used, one part may be put on the takeup roll, while the original can exit past a tear bar. A locked cover is also provided over the takeup roll to prevent unauthorized access to the journal roll. Two keys are provided. **Maximum:** One. **Field Installation:** Yes.

SHARED TERMINAL (#6350). Provides two pushbuttons, labelled START PRINT. These pushbuttons provide teller identification to the 3601 or 3602 Finance Communication Controller when two tellers are sharing one printer. **Maximum:** One. **Field Installation:** Yes.

• 15 CPS WITH 64 CHARACTER SET (#6900, #6903). [#6900 - for mdl 1 and for billing purposes only on mdls 2 and 3 ... #6903 -- for new orders on mdls 2 and 3] Provides a 64 character set consisting of 63 printable graphics and space (blank). **Maximum:** One. **Limitation:** Cannot be installed with #6901 or #6904. **Field Installation:** Available at time of manufacture only.

• UP TO 30 CPS WITH 96 CHARACTER SET (#6901, #6904). [#6901 -- for mdl 1 and for billing purposes only on mdls 2 and 3 ... #6904 -- for new orders on mdls 2 and 3] Provides a 96 character set consisting of 95 printable graphics and space (blank). **Maximum:** One. **Limitation:** Cannot be installed with #6900 or #6903. **Field Installation:** Available at time of manufacture only.

• Either #6900 or #6901, or #6903 or #6904 must be selected to complete the machine order. The selected speed applies to both print units, passbook and forms.

** Effective July 1, 1977, orders for the 3612 mdl 1 will be accepted by IBM on a Purchase Only basis.
 * Pilot Test Plan applies. PTP Purchase Option, 70%.



3612 Passbook and Document Printer (cont'd)

Special Feature Prices:

For Mdl 1 (and mdls 2 and 3 for billing purposes only)

		MAC/ MRC	ETP/ MLC 2 Yr	Purch	MMMC
Journal Takeup with Locked Cover	#4651	\$ 6**	\$ 5**	\$ 170	\$ 1.00
Shared Terminal	6350	27SUC	-	27	NC
15 CPS w 64 Char Set	6900	36**	31**	1,015	21.50
Up to 30 CPS w 96 Character Set	6901	62**	53**	1,695	26.00

For Mdls 2 and 3 - New Orders

Journal Takeup with Locked Cover	4651	6	5	170	1.00
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		MAC/ MRC	ATP/ MLC 5 Yr	Purch	MMMC
Journal Takeup with Locked Cover	#4652	\$ 6	\$ 5	\$ 170	\$ 1.00
Shared Terminal	6350	27SUC	-	27	NC
15 CPS w 64 Char Set	6903	36	31	1,015	21.50
Up to 30 CPS w 96 Character Set	6904	62	53	1,695	26.00

Accessories: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 pages for additional information and field installation.

FORMS STAND (#4450). [Mdl 3 only] Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

** Effective July 1, 1977, orders for the 3612 mdl 1 will be accepted by IBM on a Purchase Only basis.

IBM 3614 CONSUMER TRANSACTION FACILITY

Purpose: An unattended self-service banking terminal that issues variable amounts of money, accepts deposits, performs other transactions, and attaches to a 3601 or 3602 Finance Communication Controller or directly to any virtual storage S/370 or 4300 Processor via a 3704/3705 Communications Controller, or the Communications Adapter feature on the 4331 ... see 3704/3705 or 433.

- Model 1** Consumer Transaction Facility, Lobby. Designed for use inside a building. Consists of the basic unit with protective covers, a protective front panel, and a bezel around the front panel. The protective cover contains provision for customer insertion of two keylock cylinders.
- Model 2** Consumer Transaction Facility, Through the Wall. Designed for use through the wall of a building. Has a motorized protective door over the keyboard/guidance area for outdoor environmental protection. Can be attached to a heavy duty enclosure, through-the-wall bezel, and mounted on a 4", 7" or 10" high mounting stand. The heavy duty enclosure contains a combination lock and provision for customer insertion of bank examiner's type keylock for locking the combination dial.
- Model 11** Same as Model 1 with a capability of issuing two denominations during one transaction. Can also be loaded with a single denomination, doubling the bill capacity currently available in the 3614 mdl 1.
- Model 12** Same as Model 2 with a capability of issuing two denominations during one transaction. Also can be loaded with a single denomination, doubling the bill capacity currently available in the 3614 mdl 2.

Model Changes: Available at time of manufacture only.

Highlights:

Issues Cash -- withdrawal transaction issues single (mdl 1 or 2) or dual denominations (mdl 11 or 12) up to a maximum of 20 bills from a single account. Withdrawal is from a choice of four accounts.

Accepts Deposits -- deposit transaction and depository with controlled access slot allows users to deposit to checking or savings account.

Accepts Payments -- allows user to make various payments by depositing cash or check. User may also deposit payment coupon and have financial institution deduct funds from the user's account.

Cash Check -- a single transaction that allows cash to be issued to user following deposit of a check drawn on another institution.

Additional Transactions -- the 3614 also provides a general purpose special transaction, an account inquiry transaction, and a funds transfer transaction.

Transaction Chaining -- a series of multiple transactions can be performed with a single insertion of magnetic stripe card and single keyed entry of personal identification number.

Issues Statements -- can print and issue a statement or message to user.

Journaling -- transaction documents can be printed and retained in the 3614, as an aid in machine balancing.

3704/3705 Attachment -- can attach via communications link directly to a 3704 or 3705 Communications Controller.

Communications Adapter Attachment -- can attach via communications link directly to a 4331 Processor with a Communications Adapter feature.

Keyboard/Guidance -- guidance display steps user through a transaction. Customer can specify messages to be displayed.

Encrypt/Decrypt Feature -- encryption/decryption of sensitive data during communication line transmission ... provision for one of two encryption algorithms: the proposed U.S. Federal Information Processing Data Encryption Standard (DES) or the original 3614 Alternate Encryption Technique (AET) ... see "Specify."

Multi-institution Usage -- provision to accept magnetic stripe cards for 50 different card issuer identifiers with Data Encryption Standard (DES) technique.

Off-Host Operation -- offline operation via a 3601 or 3602 controller possible.

Customizing Capacity -- customer can customize terminal operation (within limits) and change guidance messages.

Identification -- the user is identified through the reading of his ABA-standard magnetic stripe card. As a second check, the user is verified by a comparison of a keyed personal identification number.

Installation -- can be installed for use inside the building or through-the-wall for outside use.

Bill Issue -- issues bills directly. No packets or cartridges are used.

Heavy Duty Enclosure: A strong steel protective enclosure to protect bills ... available for purchase on mdl 2 or 12 ... see M 10000 pages.

Logo Panel: A personalization panel in front of the 3614 for financial institution advertising. Available for purchase on mdl 1, 2, 11 or 12 ... see M 10000 pages.

PREREQUISITES:

[1] Each 3614 must have loop attachment to a 3601/3602, or SDLC attachment to S/370 via a 3704/3705.

For Attachment to a 3601/3602 there must be an available position on a local loop or remote loop of 3601/3602. The 3614 must have Terminal Loop Feature (#7820) ... if located remotely from the 3601/3602, the remote location must have a 3614/3624 with Loop Integrated Modem (#8001), a 3604 mdl 2, 3 or 4 with Line Feature Base (#4751 or 4752) and appropriate modem, or a 3603 Terminal Attachment Unit. If a 3603 is at the remote location, the 3614 or 3624 does not require Loop Integrated Modem (#8001). If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location without a 3603, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 might often be operating when the 3604 is not, e.g., weekends, holidays.

For attachment to a S/370 or 4300 Processor with virtual storage capability via a 3704/3705 Communications Controller equipped with appropriate features, or the Communications Adapter on a 4331, see 3704, 3705 and 4331. The 3614 must have SDLC Communications Feature With Clocking (#6301) or SDLC Communications Feature Without Clocking (#6302).

[2] Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see 3601 or 3602.

[3] Logo Panel (#9401 or #9402 ... see "Specify." Purchase Only.

[4] The 3614 mdl 2 and 12 require Model 2/12 Accessory Group #9571 ... see "Specify." Purchase Only.

Bibliography: GC20-0370

Specify: [1] Voltage (AC, 1-phase, 60 Hz): #9901 for 115 V.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see *Installation Manual - Physical Planning, GA27-2766*.

[3] Currency Denomination: #9091 for \$5, \$10, \$20.

[4] Keyboard: Specify one of the following. All are field installable.



3614 Consumer Transaction Facility (cont'd)

Specify Number	Mdl		Transaction								From/To Account			Change Making (Note 1) Prerequisite: Depository (#3322)		
	1 and 2	11 and 12	Withdrawal	Special	Inquiry	Transfer	Deposit	Payment Enclosed	Payment from Account	Cash Check	Checking	Savings	Credit Card		Special	
9351	o	o	*								*					
9352	o	o	*								o	o	o			
9353	o	o	o		o						o	o	o			
9354	o	o	o	o							o	o	o	o		
9355	o	o	o	o	o						o	o	o	o		
9356	o	o	o	o	o						o	o	o	o		
9357	o	o	o	o	o	o	o	o	o	o	o	o	o	o		o
9358	o	o	o	o	o	o	o	o	o	o	o	o	o	o		o
9359	o	o	o	o	o	o					o	o	o	o		o
9360	o	o	o	o	o	o					*					o
9361	o	o	o	o	o	o					*					o
9362	o	o	o	o	o	o	o	o	o	o	o	o	o	o		o
9363	o	o	o	o	o	o	o	o	o	o	o	o	o	o		o
9364	o	o	o	o	o	o	o	o	o	o	*					o
9451	o	*									*					o
9452	o	*									o	o	o	o		o
9453	o	o		o							o	o	o	o		o
9454	o	o	o								o	o	o	o		o
9455	o	o	o	o							o	o	o	o		o
9456	o	o	o	o							o	o	o	o		o
9457	o	o	o	o	o	o	o	o	o	o	o	o	o	o		o
9458	o	o	o	o	o	o					o	o	o	o		o
9459	o	o	o	o	o	o					o	o	o	o		o
9460	o	o	o	o	o	o					*					o
9461	o	o	o	o	o	o					*					o
9462	o	o	o	o	o	o	o	o	o	o	o	o	o	o		o
9463	o	o	o	o	o	o	o	o	o	o	o	o	o	o		o
9464	o	o	o	o	o	o	o	o	o	o	*					o

* Does not have any transaction select or "from Account" keys.
NOTE 1. Two currency denominations must be specified.

[5] Logo Panel [Purchase Only]: #9401, if ordered with the machine, or #9402 if ordered for shipment prior to machine ... see M 10000 pages for price.

[6] Model 2/12 Accessory Group [Purchase Only]: #9571 ... see M 10000 pages for price.

[7] 3614 Host Attachment Designation: 1st and 2nd position designation is required to control distribution of 3614 controller-data media to host system location.

1st Position Designator - identifies first 3614 of each different Controller Data Version attached to a host system ... used to limit distribution of controller-data media to one copy of each version per host system location.

2nd Position Designator - identifies additional 3614s of each version ... controller -data media is not distributed to host system location for 2nd position designated 3614s.

The following matrix identifies individual Controller Data Versions and their corresponding 1st and 2nd position specify codes. Limitations: Each 3614 must have either 1st or 2nd position specified ... one 1st position must be specified for each version ... only one 1st position may be specified for each version.

Specify either 1st or 2nd Pos Code below:			Host Attachment:	Encryption Technique
1st	2nd	Version	Loop-3601/2 DES (#9001)	AET (#9002)
#9701	#9702	3	Loop	Alternate
#9703	#9704	3	Direct	Alternate
#9801	#9802	5	Loop	DES
#9803	#9804	5	Direct	DES

When 1st position (#9701, 9703, 9801 or 9803) is specified, also specify one of the following to indicate magnetic tape density (media) used at the host system location:

- #9412 9-track 800 bpi
- #9413 9-track 1600 bpi
- #9414 9-track 6250 bpi

If magnetic tape is not used at the host system location, select one of the following media [DOS/VS users only]:

- #9431 80 column cards
- #9432 96 column cards

In order to apply 3601, 3602, or 3614 controller-data code from cards, it is necessary to have applied an Independent Component Release (ICR) to Subsystem Support Services (SSS) in DOS/VS Release 31.

[8] Specify one of the following:

DES: #9001 - provides the data encryption technique (DES) proposed as a U.S. Federal Information Processing Data Processing Standard by the U.S. National Bureau of Standards. DES facilitates multi-institution usage by providing for personal identification number (PIN) validation based on individual issuer PIN encryption keys for 50 different card issuer identifiers ... PIN offset value may be recorded on magnetic stripe to be used to validate PINs in 3614 which were not based originally on DES technique ... accepts 4 to 16 digit fixed or variable length PINs ... option to load PIN encryption keys via communication line from host. **Field Installation:** Yes. **Limitation:** Cannot be specified if #9002 is specified.

AET: #9002 - provides the Alternate Encryption Technique (AET) which is the original 3614 encryption technique. **Limitation:** May not be specified if #9001 is specified.

Prerequisite: DES and/or AET encryption capability required on the 3601 or 3602 and in host system ... see 3601 and 3602 in "Machines." DES and AET are used to determine 3614 Host 1st and 2nd Position Host Attachment designation ... see item [7] above.

Customer Responsibilities: Because the 3614 mdl 2 and 12 attach to a customer premise, installation of cables, mounting stand and enclosure and bezel are a customer responsibility. The customer is also responsible for site preparation, such as cutting a hole in the wall for mounting of the 3614 mdl 2 or 12. Installation of cables and site preparation is also a customer responsibility for the 3614 mdl 1 and 11. IBM is not responsible for any loss of money incurred through the use of the 3614.

Sub host operation under control of the 3601 or 3602 Finance Communication Controller requires special customer systems design and support. Maintenance of system integrity in the sub host mode is a customer responsibility.

IBM is not responsible for intentional damage to the 3614 mdls 1, 2, 11 or 12. Repair of such damage is not covered under the IBM Rental Agreement or Maintenance Contract. Repair of such damage at cost of time and materials will be made to rental machines and can be provided for purchases machines.

Customer Responsibilities - Currency Sorting: The general condition of used currency may vary. To achieve satisfactory operation, the customer must ensure that only GOOD QUALITY used currency is loaded into the 3614. Used or recirculated currency must be inspected to remove excessively worn, damaged or torn notes. The 3614 Operator's Guide, GA66-0001, contains procedures for preparation of new currencies and inspection of used currencies for loading the 3614. For the 3614 mdl 11 and 12 the customer must ensure that each hopper is loaded with the proper denomination currency.



3614 Consumer Transaction Facility (cont'd)

Prices:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
3614	1	\$ 629	\$ 535	\$15,710	\$ 95
	2	672	572	16,750	136
	11	751	639	18,750	100
	12	794	676	19,790	141

Plan Offering: Plan B Machine Group: D
Per Call: 1 Purchase Option: 55% Warranty: B
Useful Life Category: 2 Termination Charge Months: 5
Termination Charge Percent: 25% Upper Limit Percent: 0%

SPECIAL FEATURES

DEPOSITORY (#3322). Provides a controlled access slot in the front of the 3614 leading to an internal deposit receptacle for the collection of deposit documents. In addition to the controlled access slot, the chute is designed to discourage tampering with previously inserted deposits. **Field Installation:** Yes. **Prerequisite:** One of the following keyboards - #9357, #9358, #9360, #9457, #9458, or #9460.

EIA INTERFACE (#3701). Provides an interface for external modems. **Limitation:** Not available on Terminal Loop Feature (#7820). **Field Installation:** Yes. **Prerequisite:** SDLC Communications Feature.

EXPANDED FUNCTION FEATURE (#3895). Provides the options of transaction chaining, journal printing, and cash check transactions. **Field Installation:** Yes ... any of the individual functions may be field installed. **Prerequisite:** DES (specify code #9001). **Limitation:** May not be ordered with specify code #9002. Equivalent capability is available via RPQ for customers ordering 3614s with specify code #9002. **Specify:** Any combination of the following functions may be specified with #3895. Specify at least one:

(1) **Transaction Chaining (#9721)** - allows a series of multiple transactions with single insertion of magnetic stripe card and single keyed entry of PIN.

(2) **Journal Printing (#9722)** - print statement documents and retain in 3614 ... can be used as an aid in machine balancing and settlements. **Prerequisite:** Transaction Statement Printer (#7900).

(3) **Cash Check (#9723)** - in single transaction, cash is issued to user following deposit of check drawn on other institution. **Prerequisites:** Depository (#3322) and one of the following keyboards ... #9362, #9363, #9364, #9462, #9463, or #9464.

IBM 1200 BPS INTEGRATED MODEM (#5500). Provides an integrated 1200 bps modem for use with leased voice grade lines .. see M 2700 pages. This modem is for a point-to-point or tributary SDLC station. **Note:** This integrated modem must communicate with another IBM 1200 bps integrated modem. **Specify:** #9651 for 4-wire strapping, or #9652 for 2-wire strapping. **Field Installation:** Yes. **Prerequisite:** SDLC Communications Feature with Clocking (#6301).

SDLC COMMUNICATIONS FEATURE WITH CLOCKING (#6301). Provides communications capability to communicate with the same S/370 models listed below for #6302. Required for attachment to communications lines through the IBM 1200 BPS Integrated Modem (#5500) or any external modem which does not have internal clocking. **Limitations:** Cannot be installed with Terminal Loop Feature (#7820) or SDLC Communications Feature without Clocking (#6302). **Field Installation:** Yes. **Transmission:** This feature operates over common carrier provided or equivalent customer owned communications facilities. For information concerning these facilities, see M 2700 pages.

SDLC COMMUNICATIONS FEATURE WITHOUT CLOCKING (#6302). Provides communications capability to communicate with any virtual storage S/370 Processor (except 3115), or any 4300 Processor via a 3704/3705 ... see 3704, 3705. Attachment is also possible via the Communications Adapter feature on the 4331 ... see 4331. Required for attachment to communications lines through an external modem which does have internal clocking. **Limitations:** Cannot be installed with Terminal Loop Feature (#7820) or SDLC Communications Feature with Clocking (#6301). **Field Installation:** Yes. **Prerequisite:** EIA Interface (#3701). **Transmission:** This feature operates over common carrier provided or equivalent customer owned facilities. For information concerning these facilities, see M 2700 pages. **Modems:** External modems operating at up to 4800 bps may be attached ... IBM 3863 Modem ... IBM 3864 Modem ... IBM 3872 Modem ... IBM 3874 Modem.

TERMINAL LOOP FEATURE (#7820). Provides the capability to attach either to a local or remote 3601/3602 Finance Communication Controller loop directly; or to a remote 3601/3602 loop via a 3603, 3604 mdl 2, 3 or 4, or a 3624 with 1200 BPS Loop Integrated Modem (#8001). **Prerequisites:** (1) Available positions on

the loop ... (2) Depending on the the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601/3602. See M3601 or M3602 pages ... (3) Attachment to remote 3601/3602 loop directly requires a 1200 BPS Loop Integrated Modem (#8001). **Specify:** If loop attachment is without Loop Integrated Modem (#8001), specify one of the following loop speeds: (1) For local loop attachment to 3601/3602, specify local loop speed: #9062 for 1200 bps, #9063 for 2400 bps, or #9064 for 4800 bps ... (a) For remote loop attachment via a 3603, 3604 mdl 2, 3 or 4, or 3624, specify loop speed: #9062 for 1200 bps. **Limitations:** (1) Cannot be ordered with SDLC Communications with Clocking (#6301) or SDLC Communications without Clocking (#3602) ... (2) Remote loop speed is 1200 bps. **Maximum:** One. **Field Installation:** Yes.

TRANSACTION STATEMENT PRINTER (#7900). Prints a statement showing the record of the transaction and passes the printed statement to the customer through the cash issue slot. Data is printed on 96-column card stock (2-5/8" by 3-1/4"). A 57 character set is provided consisting of 56 printable graphics and a space (blank). Four lines, one character per line, are printed simultaneously, for up to 34 characters per line ... a total of 136 characters on each statement. The data to be printed is determined by the host application program and by the data stored in the 3614. Printing is overlapped with the cash issue cycle and the user deposit cycle. **Prerequisite:** If a statement is to be issued for any transaction on a given keyboard, then the Transaction Statement is required. **Card Limitations:** The 96-column card stock used in the transaction statement printer must not have the optional 60 degree corner cuts. Detailed disclosure specifications describing the 96-column card stock are available from IBM Corporation, Commercial Development Office, Armonk, N.Y. Card configurations or card stocks which do not conform to these specifications may result in unsatisfactory performance. The configurations available from IBM **Field Installation:** Yes.

1200 BPS LOOP INTEGRATED MODEM (#8001). Provides an integrated 1200 bps modem for use over normal quality voice grade lines. **Limitation:** If a 3604 mdl 2, 3 or 4 and a 3614 or 3624 are located at the same remote loop location, it is recommended that the loop modem be located on the 3614 or 3624 because the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not; e.g., weekends. **Field Installation:** Yes. **Prerequisite:** Terminal Loop Feature (#7820).

Special Feature Prices:		MAC/ MRC	ETP/ MLC 2 Yr	Purch	MMMC
Depository	#3322	\$ 87	\$ 74	\$2,010	\$11.50
EIA Interface	3701	12	10	424	4.00
IBM 1200 BPS					
Integrated Modem	5500	19	16	668	5.00
Expd Function Feature	3895	32	27	1,000	NC
SDLC Communications Feature					
with Clocking	6301	36	31	1,270	7.00
without Clocking	6302	31	26	1,060	7.00
Terminal Loop Feature	7820	31	26	1,060	10.50
Transaction Statement Printer	7900	119	101	2,765	23.50
1200 BPS Loop Integrated Modem	8001	19	16	668	5.00



DP Machines

M 3615
Jul 79

IBM 3615 ADMINISTRATIVE TERMINAL PRINTER

Purpose: A printer for use with the 3600 Finance Communication System to provide a hard-copy output of banking transactions.

Model 1 Prints at 60 cps (local or remote loops)

Model 2 Prints at 120 cps (local loops only)

Model Changes: Available at time of manufacture only.

Highlights:

The 3615 provides a hard copy output on a variety of cut forms and fan-fold continuous forms to meet the customer's printing requirement in banking applications. When combined with a 3604 Keyboard Display, the 3615 provides a bank teller or officer with a workstation to use in performing banking administrative transactions. The 3615 can also be used alone for administrative printing of required reports. The forms can be those usually used for printing of one line or a number of lines. Speed ranges from 60 cps for the Model 1 to 120 cps for the Model 2. This micro-processor controlled printer is a bi-directional matrix printer with high speed tabulation (Model 1 only) and indexing capability. The printer's dot matrix is 4 of 7 wide by 8 high. The 3615 prints up to 132 print positions with character spacing at 10 to the inch. Line spacing is 6 lines to the inch. Up to 6-part forms (total thickness - 0.018") may be used. Five and six part forms should be tried on an individual basis for acceptable feeding registration and print quality. For continuous fan-fold forms, the Variable Width Forms Tractor (#8700) is required ... see "Special Features." Maximum overall width for continuous forms is 381mm (15"), and 355.6mm (14") for cut forms. Card stock forms are not recommended.

Prerequisites:

- 1) An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location needs either a 3603 Terminal Attachment Unit, a 3614/3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 Keyboard Display mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or 4752) and an appropriate modem. If both a 3614/3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614/3624 since the 3614/3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.
Note: The 3615 mdl 1 will attach to local or remote loops ... the 3615 mdl 2 will attach to local loops only.
- 2) Depending upon the configuration, the Additional Storage Feature (#1005 or 1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see 3601 or 3602.

Forms Specifications: Refer to *Form Design Reference Guide for Printers, GA24-3488*.

Bibliography: GC20-0370

Supplies: A black ribbon, Part No. 1136653, or equivalent is required.

SPECIFY

- **Voltage** (115V AC, 1-phase, 60 Hz) : #9880 for locking plug, or #9881 for non-lock plug. **Field Installation:** Not recommended.
- **Cables:** See *Installation Manual - Physical Planning, GA27-2766*.

PRICES:	Mdl	MLC 5 Yr	Purchase	MMMC
	1	\$160	\$3,485	\$28
	2	186	3,825	38

Machine Group: D Per Call: 1 Purchase Option: 55%
 Termination Charge Months: 6 Termination Charge Percent: 20%
 Upper Limit Percent: 5% Warranty: B Useful Life Category: 2

SPECIAL FEATURES

VARIABLE WIDTH FORMS TRACTOR (#8700). A forms feeding device for continuous edge-punched fan-fold forms. Overall forms widths from 3 to 15 inches can be fed. This feature is required for use of continuous forms. Friction fed cut forms may also be used without removing the forms tractor. In this case, printing is limited to 127 print positions. **Field Installation:** Yes.

Special Feature Prices:	MLC 5 Yr	Purchase	MMMC
Vrbl Wdth Forms Trctr #8700	\$5	\$160	1.00

ACCESSORIES: The following item is available on a purchase-only basis.

FORMS STAND (#4450). Permits feeding of continuous forms from the carton and provides for stacking after printing.

* Pilot Test Plan applies: PTP Option Percent, 70%



IBM 3616 PASSBOOK AND DOCUMENT PRINTER

Purpose: A matrix printer used on the 3600 Finance Communication System to print on passbooks, journal, and a variety of forms and documents.

Highlights

The 3616 printer provides the ability to print on a variety of forms and passbooks to meet printing requirements of financial applications. This printer, when combined with a 3604 Keyboard Display, provides a teller or other operator with a full function workstation capable of handling a wide range of financial transactions. The printer is a bi-directional matrix printer with a maximum print speed of 120 cps. The printer dot matrix is 4 of 7 wide by 8 high.

The printer has two separate print stations serviced by one print head. The passbook print station can print up to 100 characters on passbooks or single or multipart cutforms requiring single or multi-line printing. The basic machine accepts horizontal fold passbooks of a variety of sizes. Print spacing and line indexing are both program selectable, spacing at 10 or 12 characters per inch, indexing at 5 or 6 lines per inch. **Note:** For the Vertical Fold Passbook Feature (#8701) limitations, see *Forms Design Reference Guide, GA24-3488*.

The journal print station prints up to 57 characters on a one part journal, with a locked internal take-up roll. Journal entries are visible after the entire line is printed, and remain visible for several entries thereafter. The journal may be manually advanced, but not reversed. Cutforms may be inserted in front of the journal for validation type printing of one line of print in a fixed location on the lower left-hand corner of the document. Print spacing is program selectable at 10 or 12 characters per inch. Journal indexing is nominally 6 lines per inch.

In either station, wide bold characters may be printed at 6 characters per inch. The customer may define and use up to 16 special characters, addressable separately from the basic character set, by defining their matrix patterns at CPGEN.

The printer has 8 operator status lights, including 3 user programmable. The machine has two separated "Start" pushbuttons which may be used to identify individual tellers to the 3600 controller when two tellers are sharing the printer.

The 3616 provides address sharing between like devices. That is, two 3616s can share the same loop allocation on a contention basis.

Prerequisites:

1. An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614/3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 Keyboard Display mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and an appropriate modem. If both a 3614/3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614/3624 since the Consumer Transaction Facility may be operating when the 3604 mdl 2, 3 or 4 is not.
2. Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see 3601 or 3602.

Forms Specifications: Refer to the *Forms Design Reference Guide for Printers, GA24-3488*.

Supplies: A black ribbon, Part No. 7034365, or equivalent, is required

Bibliography: GC20-0370

SPECIFY

- **Voltage** (120 V AC, 1-phase, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug.
- **Cables:** See M 10000 pages for pricing and ordering instructions. Also see *Installation Manual - Physical Planning, GA27-2766*.
- **Journal Security Feature:** #9351. Provides a change in the covers so that a cutform cannot be inserted in front of the journal.

	Mdl	MLC 5 Yr	Purchase*	AMMC/ MMMC
3616	1	\$185	\$ 4,700	\$ 40

Plan Offering: Plan D Machine Group: D Per Call: 1
Purchase Option: 55% Warranty: B Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 20%
Upper Limit Percent: 5%

SPECIAL FEATURES

VERTICAL FOLD PASSBOOK (#8701). Provides modifications to the basic machine to enable it to accept a single size of vertical fold passbook in the passbook station. The size is adjustable by the CE at initial installation. For details and limitations, see *Forms Design Reference Guide, GA24-3488*. **Maximum:** One. **Field Installation:** Available at time of manufacture only.

	MLC 5Yr	Purchase	AMMC/ MMMC
Vertical Fid Passbook #8701	\$ 3	\$100	NC

* Pilot Test Plan applies ... PTP Option Percent, 70%

IBM 3618 ADMINISTRATIVE LINE PRINTER

Purpose: A medium-speed line printer for use in the 3600 Finance Communication System.

Highlights: Provides the capability to print on continuous fanfold paper up to 80 print positions on an 8 inch (200 mm) print line. The unit has a pin feed mechanism. It accepts paper widths of 3.5 inches (89 mm) to 9 inches (229 mm) pin hole center-to-center. Paper up to 14.875 inches (378 mm) can be handled with Expanded Print Line (#3860) ... see "Special Features." Paper up to six parts plus carbon [maximum total thickness is .02 inches (5 mm)] can be accommodated. A form jam detection capability is provided. Print speeds are dependent upon the number of characters printed per line, loop speed, and available slot position on the loop.

Character Set	Nominal Print Speeds
48	155 lpm
64	120 lpm
96	80 lpm

PREREQUISITES:

- [1] An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614/3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.
- [2] Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see M 3601 or M 3602 pages.

Forms Specification: Refer to Form Design Reference Guide for Printers, GA24-3488.

Bibliography: GC20-0370

Specify: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. **Field Installation:** Not recommended.

[2] Cables: See M 10000 pages for pricing and ordering instructions. Also see Installation Manual - Physical Planning, GA27-2766.

[3] Character Set Size: #9071 for 48 characters, #9072 for 64, or #9073 for 96. A space (blank) character is included in each character set, resulting in 47, 63 or 95 printable graphics. **Field Installation:** Not recommended.

Prices:	Mdl	ETP/ MAC/ MRC		Purchase	MMMC	
		2 Yr	MLC			
	3618	1	\$ 293	\$ 249	\$10,600	\$53.50

Plan Offering: Plan B Per Call: 1 Machine Group: D
 Purchase Option: 55% Useful Life Category: 2 Warranty: B
 Termination Chg Mnths: 5 Termination Chg Percent: 25%
 Upper Limit Percent: 0%

SPECIAL FEATURES

DUAL INDEPENDENT FORMS FEED (#3550). Provides two independently indexed pin feed mechanisms. Different sizes of forms can be handled in each paper feed. **Maximum:** One. **Field Installation:** Not recommended.

EXPANDED PRINT LINE (#3860). Expands the print line to 132 print positions on a 13.2 inch (33.5 cm) line. **Maximum:** One. **Field Installation:** Not recommended.

Special Feature Prices:		ETP/ MAC/ MRC		Purch	MMMC
		2 Yr	MLC		
	Dual Indpnt Forms Feed #3550	\$ 19	\$ 16	\$ 636	\$6.50
	Expanded Print Line #3860	31	26	1,060	3.00

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 pages for additional information and field installation.

FORMS STAND (#4450). permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

IBM 3624 CONSUMER TRANSACTION FACILITY

Purpose: An unattended self-service banking terminal that issues variable amounts of money, accepts deposits, and performs other financial transactions ... other documents such as traveler's checks may be dispensed if they complete a document issue qualification test successfully ... attaches to a 3601 or 3602 Finance Communication Controller via loop, or to a virtual storage S/370 or 4300 Processor through a 3704 or 3705 Communications Controller. Communication is also possible via the Communications Adapter (#1601) on a 4331 Processor (Note: This is not supported by ACF/VTAME).

Model 1 Lobby - Single Document Feed Mechanism. For use inside a building in a secure attended location. The basic model includes a single cartridge feed station, card reader, user guidance keyboard and display unit and is suitable for counter-top or free-standing mounting ... includes covers and front trim paneling ... covers contain locking handle, with a standard key, and provision for customer insertion of an additional keylock cylinder. A backlit logo panel, required for installation of a lobby model, is available as a purchase accessory. A pedestal is available as a purchase accessory to mount the basic lobby model. A pedestal base is included as part of the depository special feature when the depository is added to the basic model.

Model 2 Through the Wall - Single Document Feed Mechanism. For outdoor, vestibule, drive-up, and otherwise less secure, unattended locations to provide availability on a 24-hour basis. The basic model includes a single cartridge feed station, card reader, user guidance keyboard and display unit, and has provision for mounting the currency dispensing and depository mechanisms inside a heavy-duty security enclosure. Covers are provided for the components not contained within the heavy-duty enclosure. A heavy-duty enclosure, pedestal base for mounting the enclosure, through-the-wall bezel, front trim paneling, and logo panel, for through-the-wall installation, are available as purchase accessories.

Model 11 Same as the model 1, but with dual document feed mechanism. Provides capability to issue the same or two different denominations in a single transaction; to load the same denomination in both dispensers, effectively doubling the bill capacity of a single denomination 3624 model 1; or to issue currency and other documents as separate transactions (e.g., cash and traveler's checks).

Model 12 Same as the model 2, but with dual document feed mechanism. Provides capability to issue the same or two different denominations in a single transaction; to load the same denomination in both dispensers, effectively doubling the bill capacity of a single denomination 3624 model 2; or to issue currency and other documents as separate transactions (e.g., cash and traveler's checks).

Model Changes: Available at time of manufacture only.

Highlights

Cartridge Loading -- currency cartridge provides for quick, easy loading and convenient, tamper-resistant transportation of the currency.

Issues Cash -- issues one denomination (mdls 1 and 2), or two denominations (mdls 11 and 12) up to a maximum of 20 bills from a choice of accounts. Issues all bills at one time in a single stack ... no prepackaging or packets are used.

Individual Document-Feed Control -- allows each cartridge drive station on the dual-feed models 11 and 12 to be associated with a separate transaction select key (e.g., cash and traveler's checks).

Accepts Deposits -- allows user to make a deposit to choice of accounts. Built-in depository envelope holder available as an accessory on mdls 2 and 12. Envelope holder included with depository on mdls 1 and 11.

Cash-Check -- a single transaction that allows cash to be issued to user, following deposit of a check.

Accepts Payments -- allows user to make various payments by depositing cash or check or by having funds deducted from user's account.

Depository Cartridge Locking System -- depository cartridge

and locking mechanism prevents removal of cartridge from machine unless cartridge is closed and locked ... reduces need for dual-custody depository servicing.

Depository Envelope Printer -- a special feature which prints unit and sequence number on envelope as it is deposited.

Additional Transactions -- provides account balance inquiry, funds transfer transaction, and special transactions.

Keyboard/Guidance -- comprehensive set of function keys and customized display messages step a user through a transaction ... keyboard and transaction functions can be modified through programming. Option for either numeric or alphanumeric keypad.

Multiline Display -- a special feature which provides 240-character, 6-line display. Includes additional display-related user-response capability for expanded interaction between user and machine.

Transaction Chaining -- allows user to perform a series of transactions with a single insertion of the magnetic stripe card.

Transaction Statements -- can print and issue individual statements or messages to user.

Journaling -- can print and retain documents within the 3624.

Backlit Logo -- backlit logo panel that can be customized, extending across full width of the front panel.

Host/Subhost Attachment -- allows attachment to the host processor either directly via SDLC or through subhost 3601/3602 via loop communications ... offhost operation at 3601/3602 is possible.

Encrypt/Decrypt -- encryption of sensitive data for communication line transmission ... uses the U.S. Federal Information Processing Data Encryption Standard (DES) algorithm.

Multi-institution Usage -- provision to accept magnetic stripe cards of many different card issuers. Base capacity of issuer identifier table within the 3624 can be expanded by table overflow request message to host or with Additional Storage Feature (#1301) ... "Special Features."

Personal Identification -- user account is identified through reading magnetic stripe card. To validate the identity of the person using the card, a personal identification number (PIN) is used ... validation of PIN (up to 16 digits) may be performed in the 3624 and/or host/subhost support system.

Installation Configurations -- can be installed inside a building, for lobby use; or through-the-wall of a building, for walk-up or drive-up use.

Multiple Languages -- capability to display different languages based on identifier code recorded on magnetic stripe card.

Third Track -- a special feature provides reading and writing third track data recorded on magnetic stripe card ... see "Special Features."

Additional Storage -- special feature(s) provide additional memory for expanding the number of custom messages and Financial Institution Table entries ... see "Special Features."

Modular Packaging -- for model 2 or 12 through-the-wall installation, currency dispenser and depository mechanisms are contained in a heavy-duty enclosure independent of other functional modules.

Compatibility -- 3614 family compatibility, designed to minimize transition requirements.

Security -- models 2 and 12 installed with heavy-duty enclosure and through-the-wall installation accessories meet security requirements of UL291 and comply with the intent of U.S. Federal Regulation P for unattended automated paying and receiving machines used when banking offices are closed.

Installation Units and Accessories -- Heavy-duty enclosure, through-the-wall bezel, optional pedestal base, front dress panel and front trim border are required for installation of through-the-wall models 2 and 12 ... these are available as purchase only accessories, see "Accessories."

Walk-up Configuration -- recessed through-the-wall bezel, designed to provide a shelf surface for the user, is recommended for walk-up use.

Drive-up Configuration -- non-recessed through-the-wall bezel, designed to position the user area nearer the outer wall surface, is recommended for drive-up use.

A pedestal for mounting lobby models 1 and 11 is available as an optional purchase only accessory ... see "Accessories."

A logo panel and cartridges are required for installation of all models and are available as purchase accessories ... see "Accessories."

3624 Consumer Transaction Facility (cont'd)
PREREQUISITES

- [1] Each 3624 must be either loop attached to a 3601/3602 or direct attached to a virtual storage S/370 or 4300 Processor via SDLC communications through a 3704/3705 Communications Controller. Also attaches via a Communications Adapter (#1601) on a 4331 Processor.

For Loop Attachment to a 3601/3602: There must be an available position on a local or remote loop of the 3601/3602. The 3624 must have Terminal Loop Feature (#7820). If located remotely from the 3601/3602, the 3624 can be attached to a remote loop via any of the following: [1] Directly, using the 1200 BPS Loop Integrated Modem (#8001) ... [2] Via a subloop through a 3603 Terminal Attachment Unit mdl 1 for 1200 bps or a 3603 mdl 2 for 1200 or 2400 bps ... [3] Via subloop through a 3604 Keyboard Display mdl 2, 3 or 4 equipped with Line Feature Base (#4751 or #4752) and an appropriate modem ... [4] Via a subloop through a 3614 equipped with Terminal Loop Feature (#7820) and 1200 BPS Loop Integrated Modem (#8001) ... [5] Via a subloop through another 3624 equipped with Terminal Loop Feature (#7820) and 1200 BPS Loop Integrated Modem (#8001). **Note:** The 3624 does not require #8001 if it is attached to a remote loop via a subloop through a 3603, 3604, 3614, 3624, or if the 3624 is attached to a local loop. It is recommended that the 3624 not be attached through a 3604, as the 3624 might often be operating while the 3604 is not, e.g., weekends and holidays.

For Direct Attachment to a Virtual Storage S/370 or 4300 Processor: The S/370 or 4300 Processor requires a 3704/3705 Communications Controller equipped with appropriate features to communicate with the 3624 via SDLC or the Communications Adapter (#1601) on a 4331 (Note: These units are not supported by ACF/VTAME). See 3704, 3705 or Communications Adapter (#1601) on the 4331. The 3624 must have an SDLC Communications Feature (#6301 or #6302).

- [2] Encryption modules BQKDES and BQKPRS are required with 3600 Host Support Independent Release program ... see *Guide for Ordering Programs* for feature numbers used to order these modules on the 3600 Host Support IR. Source listings are not orderable for, nor supplied with, these modules. Customers should be informed of this fact before the 3624 is ordered.
- [3] Depending upon the configuration, Additional Storage Feature (#1005 or #1006) may be required on the 3601, or Additional Storage Feature (#1006) may be required on the 3602 ... see 3601 or 3602.
- [4] **For 3624 mdls 1 and 11:** Pedestal, Lobby (#5510) is available as an option for free-standing lobby configuration without a depository feature ... see "Accessories." #5510 is purchase only. **Note:** A pedestal is included with the Depository, Lobby feature (#3233, #3234).
- [5] **For 3624 mdls 2 and 12:** The following units are required for through-the-wall installation: (1) Heavy-duty Enclosure, Single Function (#3901) or Dual Function (#3902). **Note:** Single function enclosure cannot be field modified to a dual function enclosure ... (2) Bezel, Through-the-Wall, Recessed or non-Recessed. Recessed Bezel (#1490) is recommended for walk-up configuration. Non-Recessed Bezel (#1491) is recommended for drive-up configuration ... (3) Front Dress Panel (#3851) ... (4) Front Trim Border, with Envelope Holder (#3961) or without Envelope Holder (#3962) ... (5) Pedestal for single function heavy duty enclosure (#4901) or dual function heavy duty enclosure (#4902) is optional for mounting heavy duty enclosure at appropriate height for walk-up or drive-up use. Storage Cabinet (#4903) is optional when mounting dual function heavy-duty enclosure without pedestal. **Note:** Storage cabinet is included with Pedestal (#4901 or #4902). See "Accessories" and M 10000 pages for descriptions and ordering information. These accessories are for purchase only.
- [6] **Logo Panel** -- required on all 3624 models. Shipment of the logo panel is determined by the following specify codes: (1) #9401 if panel is to be shipped with the 3624. (2) #9402 if panel(s) are to be shipped prior to the 3624. **Note:** Specify feature #9402 can be used to order more than one panel if the customer desires to have several panels delivered before the 3624 (e.g., for customization at one time). (3) #9403 if panel is not to be ordered with the 3624 as it will either be ordered separately by part number or ordered under specify code #9402 on another 3624 ... see "Specify" and "Accessories." Purchase only.
- [7] **Currency Cartridge** -- For 3624 mdls 1 and 2: One is required. For 3624 mdls 11 and 12: Two are required. Currency cartridges are not included with the basic 3624 and must be ordered separately. Spare cartridges are recommended for convenience of operation. A minimum of one spare cartridge

for mdls 1 and 2, and two spare cartridges for mdls 11 and 12 must be made available by the customer to the CE for normal 3624 maintenance ... see "Accessories." Purchase only. See "Customer Responsibilities - 3624 Currency Cartridge" in M 10000 pages for installation and maintenance requirements.

Customer Responsibilities

Installation Facilities -- because the 3624 mdl 2 or 12 attaches to customer premises, installation of cables, pedestal, heavy-duty enclosure, through-the-wall bezel, front dress panel, front trim border, and logo panel are customer responsibilities. The customer is also responsible for site preparation, such as cutting a hole in the wall. For mdls 2 and 12, the customer is responsible for placement of the document feed and depository modules into the heavy-duty enclosure and attachment of the I/O module to the heavy-duty enclosure. Installation of cables and site preparation are customer responsibilities also, for 3624 lobby mdls 1 and 11. The customer is responsible for installation of the Currency Area Lockoff accessory.

Machine Maintenance -- IBM will not provide warranty or maintenance service on a 3624 containing money. The customer will be responsible for removing, controlling and reloading all money in the 3624 so that IBM can fulfill its warranty and maintenance obligations.

Keylocks -- covers included with lobby mdls 1 and 11 have a locking handle, with a standard key, and provide for customer insertion of an additional keylock cylinder. Covers included with through-the-wall mdls 2 and 12 have a keylock cylinder, with a standard key. Cabinet doors, included in all pedestals, have a keylock cylinder with a standard key. The Currency Area Lockoff accessory includes a keylock with a standard key. Currency cartridges provide for customer insertion of a keylock. Depository cartridge used with depository cartridge locking feature requires customer insertion of the depository keylock. Depository locking mechanism in the 3624 requires customer installation of the depository cartridge locking key. If the customer desires to change the locks and/or keys included with these units or to install additional keylock cylinders where provided for, he is responsible for their procurement and installation.

Accessories Maintenance -- the customer is responsible for maintenance and parts procurement on all accessories. Repair of the currency issue and depository slot protective environmental gates in the heavy-duty enclosure can be provided by IBM on a time and material basis.

Currency Cartridge -- the 3624 Currency Cartridge is a purchase only accessory and is not included with the basic 3624. One cartridge is necessary for mdls 1 and 2, and two for mdls 11 and 12 for installation checkout and operation of the 3624. Models 2 and 12 may also be operated with a single cartridge. Cartridges are not maintained by IBM under the normal lease agreement or MMMC for a purchased machine. The customer is responsible for determining if the cartridge is the failing unit; for providing cartridge for CE 3624 maintenance and testing (a minimum of one spare cartridge for mdls 1 and 2 and two for mdls 11 and 12 must be made available by the customer to the CE for normal 3624 maintenance); and for setting the keying system on the cartridges and drive stations so that there is the desired match of currency denomination to drive station ... see "Customer Responsibilities - 3624 Currency Cartridge" in the M 10000 pages for installation and maintenance requirements.

Currency Sorting -- to achieve satisfactory operation, the customer must ensure that only new currency and good-quality used currency are used in the 3624. The general condition of used currency may vary. Used currency must be inspected to remove excessively worn, damaged, or torn bills. The *IBM 3624 Operator's Guide, GA66-0006* and *IBM 3624 Cartridge Owner's Manual, GA66-0005*, contain procedures for preparation of new currency and inspection of used currency for operation in the 3624. For the 3624 mdls 11 and 12, the customer must ensure that each feed mechanism is loaded with the proper denomination currency. The cartridges contain a keying mechanism which can be set by the customer to ensure a match between specific cartridges and cartridge drive stations.

Printer Ink Rolls -- the customer is responsible for procurement and replacement of ink rolls in transaction statement and depository printers.

Logo Lamp -- the customer is responsible for procurement and replacement of the lamp in the logo panel light assembly.

Damage -- IBM is not responsible for intentional damage to the 3624 or any 3624 accessories. Repair of such damage is not covered under the IBM Maintenance Contract, Lease Agreement or under the Pilot Test Plan. Repair of such damage at cost of time and materials will be provided for leased machines, Pilot Test machines, and purchase machines.

System Integrity -- subhost operation, under control of the

3624 Consumer Transaction Facility (cont'd)

3600 Finance Communication Controller, requires customer systems design and support. Maintenance of system integrity in the subhost is a customer responsibility.

IBM is not responsible for any loss of money to the financial institution or its customers through the use of the 3624.

Third Track System Security Statement -- customers ordering the Third Track feature (#7950) must be advised that:

"IBM believes that the system security is optimized in an online environment, where PIN validation and transaction authorization can be performed in conjunction with positive-file data bases. The scope of security exposure expands with the degree of offline implementation, for which the Third Track might be used. The U.S. Federal Information Processing Data Encryption Standard (DES) algorithm is utilized to provide cryptographic security in the 3624 and may be used in conjunction with the third track application. IBM recommends that the customer consider using DES for this purpose. An optional security feature of the proposed ANSI/ISO Third Track Data Content standard is a Crypto Check Digits (CCD) field in the card, that may be used to relate the data elements of track 3 to the magnetic stripe. This does not imply, however, that its use is not subject to fraud techniques. ANSI/ISO has not prescribed using the optional CCD field or any specific CCD implementation technique. IBM recommends that the customer consider its value in his application, weighing possible enhancements in security with economic and performance implications for his system. IBM will continue to pursue a course of action with customers and industry to maintain a high level of system security.

IBM reserves the right to modify the parameters of the track 3 function if the parameters of the final ANSI/ISO standard differ from those now in the process of standardization. However, this reservation of rights is not intended nor should it be construed as a commitment by IBM to support parameters different from those published by ISO/DIS 4909-June 1976."

Bibliography: GC20-0370

SPECIFY

- **Voltage** (120V, AC, 1-phase, 60Hz): **#9911** ... usable on 115V.
- **Cabling:** Refer to *Installation Manual-Physical Planning, GA27-2766 and GA26-1658*. Also see M 10000 pages for pricing and ordering instructions.
- **Keyboard Arrangement:** **#9301** for numeric-only keypad, or **#9302** for alphanumeric keypad ... alphanumeric arrangement is the basic touch-pad telephone format with the Q and Z added over the numeric "0".
- **Currency Cartridge:** See M 10000 pages for ordering instructions and prices.
- **Currency Denomination:** **#9091** for 5, 10, 20 dollar.
- **Keyboard:** Specify one of the following for standard keyboard ... an RPQ should be submitted for any keyboard not shown below. All are field installable. The Change key allows the user to request a change in the denomination mix to be issued on mdls 11 and 12. The Change key is used also, on all models, to page displays with the Multiline Display feature (#4750).

Specify Number		Transaction Type							From Account To Account				
All Models ... w/o Change Key	Models 11/12 or All Models w #4750 ... with Change Key	Withdrawal	Special (3)	Balance	Transfer	Deposit (2)	Payment Enclosed (2)(4)	Payment from Account (2)	Cash Check (2)	Checking	Savings	Credit Card	Other
		#9351	#9451	(1)								(1)	
9352	9452	(1)								0	0	0	
9353	9453	0	0							0	0	0	
9354	9454	0	0							0	0	0	0
9355	9455	0	0	0						0	0	0	
9356	9456	0	0	0						0	0	0	0
9357	9457	0	0	0	0	0	0	0		0	0	0	0
9358	9458	0	0	0	0	0				0	0	0	0
9359	9459	0	0	0	0					0	0	0	0
9360	9460	0	0	0	0					(1)			
9361	9461	0	0	0	0					(1)			
9362	9462	0	0	0	0	0	0	0		0	0	0	0
9363	9463	0	0	0	0	0				0	0	0	0
9364	9464	0	0	0	0	0				0	(1)		

Notes

- (1) Key position does not appear on the keyboard panel; single function is selected automatically.
- (2) Prerequisite: Depository #3233, 3234, 3243 or 3244.
- (3) Prerequisite: Depository #3233, 3234, 3243 or 3244 if any Special transactions are customized to require a deposit step.
- **Logo Panel Group:** Specify one of the following: **#9401** if logo panel is to be shipped with 3624 ... **#9402** if logo panel(s) is to be shipped prior to the 3624 ... **#9403** if logo panel is not to be ordered with 3624 and will either be ordered separately by part number or has been ordered through #9402 on another 3624. **Note:** More than one panel may be ordered on specify code #9402 if customer desires to have several panels delivered before the 3624 (e.g., for customization at one time). Purchase only. See M 10000 pages for prices and order information.
- **Controller-Data Designation:** 1st and 2nd position designation is required to control distribution and maintenance of controller-data media necessary for 3624 load images. Specify **#9491** or **#9492** as follows:

1st Position Designator (#9491). Used to determine which controller-data set is to be distributed to the host-system location. One 3624 attached to a host-system processor is specified #9491.

2nd Position Designator (#9492). Used to identify additional 3624s attached to host-system ... controller-data set media are not distributed to host-system location for any 2nd position designated 3624s.

When 1st position (#9491) is specified, also specify one of the following:

If magnetic tape is used at the host-system location:

- #9412** 9-track, 800 bpi
- #9413** 9-track, 1600 bpi
- #9414** 9-track, 6250 bpi

If magnetic tape is not used at the host-system location (DOS/VS users only):

- #9431** 80 column cards
- #9432** 96 column cards

When 1st position (#9491) is specified, additional information is required to determine the shipping address of the controller-data media.



3624 Consumer Transaction Facility (cont'd)

This is the address to which controller-data media will be automatically shipped after first 3624 is ordered.

Changes to 1st Position Designators for On-order and Installed 3624s: If a 1st position (#9491) 3624 is deferred, cancelled, or discontinued and 2nd position (#9492) 3624s have been specified, then one 2nd position 3624 must be altered from 2nd to 1st position (from #9492 to #9491) to ensure continued distribution of controller-data media to the host system location. When altering a 3624 to 1st position, include all items as required to be specified when #9491 is specified (items specified on previous 1st position 3624) ... if the host system location changes the input medium (e.g., from 1600 bpi to 6250 bpi tape), the media specify code must be changed on the 3624 with #9491 specified. In this case, the former media specify code must be deleted and the new one added

PRICES:	MDL	MLC (5 Yr)	Purchase	MMM
3624	1	\$499	\$12,150	\$95
	2	587	13,400	136
	11	582	14,150	100
	12	648	15,400	141

Plan Offering: Plan B Maintenance: D
Per Call 1 Purchase Option: 50%
Warranty: B Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 20%
Upper Limit Percent: 5%
Pilot Test Plan Purchase Option: 60%

SPECIAL FEATURES

ADDITIONAL STORAGE FEATURE (#1301). Provides an additional 2,048 bytes of storage. The user can utilize this to increase the number of custom messages, entries in Financial Institution Table, and as might be necessary for RPQs. To determine the number of additional storage features required, see *IBM 3624 Programmer's Reference Manual and Component Description, GC66-0009*. **Prerequisite:** Storage Expansion Feature (#6501) is required for either: 1) first Add'l Storage Feature (#1301) increment when ordered with Multiline Display (#4750) and SDLC Communications Feature (#6301 or #6302), or 2) third Additional Storage Feature (#1301) increment when ordered with Multiline Display (#4750) and Terminal Loop Feature(#7820). **Maximum:** Two if without Multiline Display (#4750) ... five if with #4750. **Field Installation:** Yes.

DEPOSITORY, LOBBY (#3233). [Models 1 and 11 only] Provides envelope transport mechanism leading from a controlled access slot to deposit receptacle inside the 3624. The depository transport is designed to discourage tampering with previously inserted deposits. Includes a pedestal stand, with lockable rear access door and standard key, and a built-in depository envelope holder. Deposit envelopes may vary in size from 3.5" x 6.0" (88.9mm x 152.4mm) to 4.5" x 9.75" (114.3mm x 247.7mm) and shall be constructed of paper having basic weight of sub 20 through sub 28. Maximum thickness of a deposit envelope and its contents is 0.5" (12.7mm). **Limitation:** Cannot be installed in Pedestal, Lobby (#5510). **Maximum:** One. **Field Installation:** Yes.

DEPOSITORY, THROUGH-THE-WALL (#3243). [Models 2 and 12 only] Provides envelope transport mechanism leading from a controlled access slot in the security enclosure to deposit receptacle inside the 3624. In addition to the controlled access slot in the security enclosure, the depository transport is designed to discourage tampering with previously inserted deposits. Deposit envelopes may vary in size from 3.5" x 6.0" (88.9mm x 152.4mm) to 4.5" x 9.75" (114.3mm x 247.7mm) and shall be constructed of paper having basis weight of sub 20 to sub 28. Maximum thickness of a deposit envelope and its contents is 0.5" (12.7mm). **Prerequisite:** Heavy-Duty Enclosure, Dual Function (#3902) ... see "Accessories." **Limitation:** Cannot be installed with Heavy-Duty Enclosure, Single Function (#3901). **Maximum:** One. **Field Installation:** Yes. **Note:** Field installation requires that Heavy-Duty Enclosure, Dual Function (#3902) has been initially ordered.

DEPOSITORY PRINTER (#3245). Prints sequence number on envelope as it passes through the depository throat. Six numeric digits are printed horizontally at repeated intervals along the envelope. Three digits are set by the customer engineer to identify the unit, and three digits are automatically sequenced when envelope passes print station. The depository ink roll is IBM Part No. 457149. It is the customer's responsibility to purchase and re-

place the ink roll when required. **Prerequisite:** Depository, Lobby (#3233) or Depository, Through-the-Wall (#3243). **Maximum:** One. **Field Installation:** Yes.

DEPOSITORY CARTRIDGE LOCKING FEATURE (#3150). [Models 2 and 12 only] Provides locking mechanism in the depository that prevents removal of the depository cartridge unless it is closed and locked. Operates with Depository Cartridge (#3155) ... see "Accessories" and M 10000 pages for purchase of cartridges. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Depository, Through-the-Wall (#3243). Minimum of one Depository Cartridge (#3155) is required for operation.

EIA INTERFACE (#3701). Provides the appropriate cables and interface logic necessary to attach an external modem for communications attachment to the S/370 or 4300 Processor via SDLC through a 3704/3705 Communications Controller, or the Communications Adapter (#1601) on a 4331 Processor. Non-IBM modems may be attached subject to the Multiple Suppliers System Policy. **Prerequisite:** SDLC Communication Feature (#6301 or #6302). **Limitation:** Cannot be installed with 1200 BPS Integrated Modem (#5500), or Terminal Loop Feature (#7820). **Maximum:** One. **Field Installation:** Yes.

MULTILINE DISPLAY (#4750). Displays up to 240 characters ... six lines of 40 characters each. Characters are presented in predefined 7 x 9 and 7 x 7 dot matrices for upper case alphabetic, special characters, and language-unique characters including the Hebrew alphabet. Additional interactive functions are provided for expanded communications between the user and the attached host. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** 1) The Change key is required if display paging ... see Keyboard under "Specify" or 2) Increased storage storage may be required to support larger size of display and additional interaction function ... see Additional Storage Feature (#1301) and Storage Expansion Feature (#6501).

IBM 1200 BPS INTEGRATED MODEM (#5500). Provides an internal modem for communications attachment to the S/370 processor via SDLC at 1200 bps over non-switched half-duplex or duplex voice grade lines. **Note:** This integrated modem must communicate with another IBM 1200 bps integrated modem. **Specify:** #9651 for 4-wire strapping, or #9652 for 2-wire strapping. **Prerequisite:** SDLC Communications Feature with Clocking (#6301). **Limitation:** Cannot be installed with EIA Interface (#3701), SDLC Communications Feature Without Clocking (#6302), Terminal Loop Feature (#7820), or 1200 BPS Loop Integrated Modem (#8001). **Maximum:** One. **Field Installation:** Yes.

SDLC COMMUNICATIONS FEATURE WITH CLOCKING (#6301). Provides capability to attach to a host system via SDLC, e.g., S/370 or 4300 Processor through a 3704, 3705, or the Communications Adapter (#1601) on a 4331. Required for attachment to communication facilities through the IBM 1200 BPS Integrated Modem (#5500), or through the EIA Interface (#3701) to any 1200 bps external modem which does not have internal clocking. **Prerequisite:** IBM 1200 BPS Integrated Modem (#5500) if no external modem, or EIA Interface (#3701) if external modem. **Limitation:** Cannot be installed with Terminal Loop Feature (#7820), SDLC Communication Feature without Clocking (#6302), or 1200 BPS Loop Integrated Modem (#8001). **Maximum:** One. **Field Installation:** Not recommended for field installation if Terminal Loop Feature (#7820) is installed. SDLC Communications Feature Without Clocking (#6302) can be changed to #6301 in the field. **Transmission:** This feature operates over common carrier communication facilities. For information concerning these facilities, see M 2700 pages.

SDLC COMMUNICATIONS FEATURE WITHOUT CLOCKING (#6302). Provides capability to attach to a host system via SDLC, e.g., S/370 or 4300 Processor through a 3704, 3705, or the Communications Adapter (#1601) on a 4331. Required for attachment to communication facilities through the EIA Interface (#3701) to any external modem which provides internal clocking speeds up to 4800 bps. **Prerequisite:** EIA Interface (#3701). **Limitations:** Cannot be installed with Terminal Loop Feature (#7820), SDLC Communications Feature With Clocking (#6301), IBM 1200 BPS Integrated Modem (#5500), or 1200 BPS Loop Integrated Modem (#8001). **Maximum:** One. **Field Installation:** Not recommended for field installation if Terminal Loop Feature (#7820) is installed. SDLC Communications Feature With Clocking (#6301) can be changed in the field to #6302. **Transmission:** This feature operates over common carrier communication facilities. For information concerning these facilities, see M 2700 pages. **External Modems:** IBM external modems that may be attached are:

3863 Modem mdl 1	2400/1200 bps (non-switched)
3864 Modem mdl 1	4800/2400 bps (non-switched)
3872 Modem mdl 1	2400/1200 bps (non-switched)
3874 Modem mdl 1	4800/2400 bps (non-switched)

Note: 4-wire Switched Network Backup is available on the 3863 mdl 1 and 3864 mdl 1. For

3624 Consumer Transaction Facility (cont'd)

communications capability, product utilization and features see 3863, 3864 and M 2700 pages.

STORAGE EXPANSION FEATURE (#6501). Provides capability to add increments of the Additional Storage Feature (#1301) if Multiline Display (#4750) is installed. Required for either: 1) the first #1301 increment when ordered with #4750 and SDLC Communications Feature (#6301 or #6302), or 2) the third #1301 increment when ordered with #4750 and Terminal Loop Feature (#7820). **Prerequisite:** Multiline Display (#4750). **Maximum:** One. **Field Installation:** Yes.

TERMINAL LOOP FEATURE (#7820). Provides capability to attach to a 3601/3602 loop. Attachment to local loop is directly. Attachment to remote loop can be either directly or via remote subloop through a 3603, a 3604 mdl 2, 3 or 4, a 3614, or another 3624. **Prerequisites:** [1] Available position on the loop. [2] Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601/3602 ... see 3601 or 3602. [3] Attachment to a 3601/3602 local loop directly does not require an additional feature. [4] Attachment to a 3601/3602 remote loop directly requires 1200 BPS Loop Integrated Modem (#8001). [5] Attachment to a 3601/3602 remote loop via remote subloop requires one of the following: 3603 Terminal Attachment Unit mdl 1 or 2 for 1200 bps or mdl 2 for 2400 bps ... 3604 mdl 2, 3 or 4 with Line Feature Base (#4751 or #4752) and appropriate modem ... 3614 with Terminal Loop Feature (#7820) and 1200 BPS Loop Integrated Modem (#8001) ... or another 3624 with Terminal Loop Feature (#7820) and 1200 BPS Loop Integrated Modem (#8001). **Specify:** [1] For attachment to a 3601/3602 local loop specify one of the following loop speeds: #9062 for 1200 bps, #9063 for 2400 bps, or #9064 for 4800 bps. [2] For attachment to 3601/3602 remote loop via subloop through a 3603 mdl 1 or 2 at 1200 bps, #9062 ... [3] For attachment to 3601/3602 remote loop via subloop through 3603 mdl 2 at 2400 bps, #9063 ... [4] For attachment to 3601/3602 remote loop via subloop through 3604, 3614 or another 3624, #9062 for 1200 bps. **Limitations:** [1] Cannot be installed with SDLC Communications Feature (#6301 or #6302), EIA Interface (#3701), or IBM 1200 BPS Integrated Modem (#5500) ... [2] Remote loop speed is 1200 bps maximum when attached directly or via subloop through 3603 mdl 1 or 2, 3604, 3614, or another 3624 ... is 2400 bps maximum via subloop through 3603 mdl 2 ... [3] Loop Integrated Modem (#8001) is not required if the 3624 is attached to a local loop, or via subloop to remote loop through 3603, 3604, 3614 or another 3624. **Maximum:** One. **Field Installation:** Not recommended for field installation if SDLC Communications Feature (#6301 or #6302) is installed.

THIRD TRACK (#7950). Provides for reading data on track two and/or both reading and writing data on track three of magnetic stripe card. Presently conforms to ISO/3554/AD1 Third Track Standard, and proposed Data Content Standard ISO/DIS 4909. Can read tracks two and three independently or in conjunction with each other. **Maximum:** One. **Field Installation:** Not recommended.

TRANSACTION STATEMENT PRINTER (#8201). Prints document showing record of transaction and issues to user through the transaction statement slot. Prints documents for audit use that can be retained in a journal stacker in the 3624. Print feed hopper has a capacity of 2,000 documents. Journal stacker has a capacity of 400 documents. Data is printed on 96-column card stock 2-5/8" x 3-1/4" (66.7mm x 82.6mm) in size. Provides a 57 character set consisting of 56 printable graphics and space (blank). Four lines can be printed with up to 34 characters per line ... maximum of 136 characters on each document. The data to be printed is determined by the host application program. Printing is overlapped with currency issue and user deposit cycles. **Card Limitations:** The 96-column card stock used in the statement printer must not have corner cuts. Detailed disclosure specifications describing 96-column card stock are available from IBM Corporation, Commercial Development Office, Armonk, N.Y. The configurations available from IBM

Maximum: One. **Field Installation:** Yes.

1200 BPS LOOP INTEGRATED MODEM (#8001). An internal modem for attachment to a 3601/3602 remote loop. Operates at 1200 bps over non-switched unconditioned voice-grade lines. **Prerequisite:** Terminal Loop Feature (#7820). **Limitation:** Not required if 3624 is attached to a 3601/3602 remote loop through a 3603, 3604 mdl 2, 3 or 4, 3614, or another 3624 ... or if attached to a 3601/3602 local loop. If there are both a 3604 and a 3624 located at the same remote loop location that does not have a 3603 or 3614, it is recommended that the loop modem (#8001) be located on the 3624, because the 3624 might often be operating while the 3604 is not, e.g., weekends. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MLC			
	#	5 Yr	Purchase	MMMC
Add'l Storage Feature	#1301	\$6	\$142	\$1.00
Depository Cartridge				
Locking Feature	3150	24	840	1.50
Depository, Lobby	3233	80	2,615	7.50
Depository, Thru-the-Wall	3243	67	2,140	7.50
Depository Printer	3245	37	500	15
EIA Interface	3701	17	424	4.00
Multiline Display	4750	46	1,200	9.50
IBM 1200 BPS Intgd Modem	5500	23	668	4.00
SDLC Communictns Feature				
with Clocking	6301	44	1,270	7.00
without Clocking	6302	41	1,060	7.00
Storage Expn Feature	6501	12	420	.50
Terminal Loop Feature	7820	46	1,160	10.00
Third Track	7950	117	2,000	41.00
1200 BPS Loop Intgd Modem	8001	15	334	4.00
Transaction Stmt Printer	8201	141	2,280	23.50

ACCESSORIES: The following items are available on a purchase only basis. See M 10000 pages for additional description, feature codes, prices and order information.

HEAVY-DUTY ENCLOSURE, SINGLE FUNCTION (#3901). [Mdls 2 and 12 only] Required for installation of mdls 2 and 12 with currency dispensing function only (**Note:** The dual function heavy-duty enclosure may also be used with currency dispensing function only, if desired.) Provides a thick steel enclosure for currency dispensing mechanism of through-the-wall models that do not have depository. A single rear access door includes a combination lock. The combination of the combination lock is set by the customer. Dual Lock (#3375) is available as an option, providing a second combination lock on rear access door. Dial Keylock (#3310) is available as an option, providing keylock that prevents turning the combination dial when locked; used for dual control and/or where bank examiner type lock is desired. Penetration-detection grid is provided across the inside front face of enclosure.

HEAVY-DUTY ENCLOSURE, DUAL FUNCTION (#3902). [Mdls 2 and 12 only] Required for installation of mdls 2 and 12 with currency dispensing and depository functions. Can also be used to house currency dispensing function without depository, providing additional lockable storage area. Provides thick steel enclosure for currency dispensing and depository mechanisms. A single rear access door includes a combination lock. The combination of the combination lock is set by the customer. Dual Lock (#3375) is available as an option, providing a second combination lock on the rear access door. Dial Keylock (#3310) is available as an option, providing keylock that prevents turning the combination dial when locked; used for dual control and/or where bank examiner type lock is desired. Penetration-detection grid is provided across the inside front face of enclosure.

BEZEL, THROUGH-THE-WALL (#1490 or #1491). [Mdls 2 and 12 only] Required for installation of mdls 2 and 12. Provides bezel to interface outside wall surface with 3624 enclosure through-the-wall of building or other structure. #1490 -- a recessed bezel that provides a shelf surface. Recommended for walk-up use ... #1491 -- a non-recessed bezel which positions the user guidance area nearer outside wall surface. Recommended for drive-up use.

PEDESTAL, FOR HEAVY-DUTY ENCLOSURES (#4901 or #4902). [Mdls 2 and 12 only] Available for installation of mdls 2 and 12. A mounting stand to locate the 3624 at a height most convenient for user operation ... includes a lockable storage cabinet ... available for single and dual function heavy-duty enclosures in heights appropriate for walk-up or drive-up use. Recommended nominal keyboard heights are 52" (1321mm) for walk-up, 42" (1067mm) for drive-up. #4901 -- for 3624s that use the single function enclosure (#3901) ... #4902 -- for 3624s that use the dual function enclosure (#3902). **Specify:** For keyboard centerline height from mounting surface -- #9701 for 42" (1067mm) ... #9702 for 47" (1194mm) ... or #9703 for 52" (1321mm).

STORAGE CABINET, FOR DUAL FUNCTION HEAVY-DUTY ENCLOSURE (#4903). [Mdls 2 and 12 only] Available for installation of mdls 2 and 12. A lockable storage cabinet for installation of the dual function heavy-duty enclosure (#3902) directly to a mounting surface where a pedestal is not required.

PEDESTAL, LOBBY (#5510). [Mdls 1 and 11 only] A mounting stand for free-standing configuration of lobby model without the depository feature. **Note:** #5510 is not required if customer intends to install a 3624 mdl 1 or 11, without the depository feature, on an alternative mounting surface or stand. #5510 is not required if a 3624 mdl 1 or 11 is installed with a depository feature (#3233) since a pedestal base is included in #3233.



3624 Consumer Transaction Facility (cont'd)

FRONT DRESS PANEL (#3951). [Mdl's 2 and 12 only] Required for installation of mdl's 2 and 12. Provides user guidance area panel covers and logo lamp assembly.

FRONT TRIM BORDER (#3961 or #3962). [Mdl's 2 and 12 only] Required for installation of mdl's 2 and 12. Provides trim border panel around the bezel on the outside of building for outer seal of through-the-wall installation. **#3961** -- includes a built-in depository envelope holder ... **#3962** -- has no envelope holder.

LOGO PANEL (#9401, #9402, #9403). [All Models] Required for installation on all models of the 3624. Provides a panel that can be personalized by the customer (silk-screened, painted, etc.). Can be shipped with the 3624 or prior to the 3624. See "Specify Section" above for specification of appropriate specify code.

CURRENCY CARTRIDGE (#9110). Required for installation of any 3624. Portable container for loading, storing, transporting, and issuing currency or other approved documents ... interchangeable between 3624s. See M 10000 pages for customer responsibilities, recommended number of spare cartridges, and maintenance.

DEPOSITORY CARTRIDGE (#3155). [Mdl's 2 and 12 only] Portable container for receiving and transporting deposits. Required for operation with Depository Cartridge Locking Feature (#3150).

3624 CURRENCY AREA LOCKOFF (#3312). [Models 2 and 12 only] Provides a security panel to enclose the currency area. Enables the document feed mechanism to be locked in the machine. When used with the Depository Cartridge Locking Feature (#3150), it restricts access to the currency area during normal operational servicing of the depository and/or other areas of the 3624. Includes keylock and standard key. Available only when installed with the Heavy Duty Enclosure, Dual Function (#3902).

3624	MDL/Feature	PILOT TEST	
		6 MOS.	3 MOS.
	1	\$3,038	\$1,519
	2	3,350	1,675
	11	3,538	1,769
	12	3,850	1,925
	#1301	55	28
	3233	654	327
	3234	779	390
	3243	535	268
	3244	660	330
	3701	106	53
	4750	300	150
	5500	167	84
	6501	105	53
	6301	318	159
	6302	265	133
	7950	500	250
	7820	290	145
	8001	84	42
	8201	570	285

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**IBM 3631 PLANT COMMUNICATION
CONTROLLER**

Purpose: A programmable controller for attachment of 3640 terminals to S/370 or 4300 processors using appropriate virtual storage system control programs, or an 8100 System using the Distributed Processing Program Executive (DPPX).

S/370 or 4300 Processor attachment is via a 3704/3705 Communications Controller using synchronous data link control (SDLC) transmission protocols over various common carrier or user-owned transmission facilities. Communication is also possible via a Communications Adapter feature on the 4331 Processor (Note: This is not supported by ACF/VTAME).

8100 System attachment is via the 8130, 8140 and/or the 8101 data link using SDLC transmission protocols over various common carrier or user-owned transmission facilities.

Terminal attachment is via directly attached or data link attached loops which utilize synchronous data link control (SDLC) transmission protocols. The loops are user-owned transmission facilities which are constructed from IBM accessories ... see "3630 Loop Accessories" in M 10000 pages.

Model 1A Includes an IBM diskette drive which accommodates an IBM Diskette 1 diskette of 250K byte capacity.

Model 1B Includes an IBM diskette drive which accommodates an IBM Diskette 2 diskette of 500K byte capacity.

Highlights

Controls the functions of a 3630 Plant Communication System. Customers, using SCP programs on virtual storage S/370 or 4300 Processor systems or 8100 Systems, will prepare user-written application programs which direct system operation. The controller can be programmed to operate independently when the S/370 is unavailable. It is capable of controlling terminal functions, executing arithmetic and logic functions, and capturing data from the terminals for later transmission to the S/370. A keylock is provided for locking access to the diskette drive.

The model 1A accommodates IBM Diskette 1 of 250K byte capacity. The Model 1B accommodates IBM Diskettes 1 or 2 having 250K and 500K byte capacities. The diskette provides permanent storage for control code and application programs, plus permanent and temporary storage for user data. Data required to be on the diskette, exclusive of customer data, will often exceed 200K bytes. During normal operation, performance characteristics of the diskette drive dictate that that device be used primarily for infrequent data logging.

IBM and customer code is transmitted to the controller where it is written on a diskette. The diskette may also be used to hold application data in the space not required for control code. At controller start-up, diagnostics, control code and application code are read from the diskette into control and application storage. During system operation, the diskette may be used to access data and code.

Storage included in the controller is used for control code, and application control data and instructions. The amount of storage available for application programming depends on the attached terminal configuration and user environment. Included in the basic machine is 65,536 bytes of application storage. Both control and application storage may be extended in 16,384 byte increments ... see "Special Features."

All 3640 terminals are attached to customer-owned loops. A variety of accessories and wire are available for the construction of the loops ... see "3630 Accessories" in the M 10000 pages. Up to two Loop Adapters may be installed to directly connect one loop each. The Loop Adapters each provide two loop lobes. Each lobe may extend up to 3.2 cable kilometers (2 cable miles). Loops are operated at 9600 bps. A loop, consisting of one lobe, may be connected to a 3842 Loop Control Unit. The 3842 can be connected multipoint or point-to-point on a common carrier or customer-owned transmission facility to an IBM 3863 or 3872 Modem at the 3631 site for operation at 2400 bps. A loop can accommodate a number of loop-terminal connections. See the *IBM 3630 Plant Communication System Description* for additional information.

Communication with a virtual storage host S/370 or 4300 processor is via a 3704, 3705 or Communications Adapter on 4331 Processor using SDLC and SNA protocols. The EIA/CCITT Interface - Host (#3701) and either an external modem or the Line Set Type 1F (#4716) on the 3704/3705 (on 4331, the Local Attachment Interface (#4801) feature) are required for host communication. See M 2700 and M 4331 pages for Communications Adapter features on 4331. Each 3631 operates in half-duplex mode. Duplex communication line operations are possible with multiple 3631s and 3632s attached to the line ... one 3631/3632 transmitting while the other receives.

Communication with an 8100 System is via the 8130, 8140 and/or the 8101 data link using the SDLC protocol. The EIA/CCITT Interface - Host (#3701) on the 3631 is used on an SDLC data link or direct connect facility provided by the 8100. Each 3631 operates in half-duplex mode.

The following IBM external modems can be used:

3863 mdl 1	2400/1200 bps - non-switched
3864 mdl 1	4800/2400 bps - non-switched
3865 mdl 1 or 2	9600/4800 bps - non-switched
3872 mdl 1	2400/1200 bps - non-switched
3874 mdl 1	4800/1200 bps - non-switched

Note: 4-wire Switched Network Backup is available on the 3863 mdl 1, 3864 mdl 1 and 3865 mdl 1 or 2. For communications capabilities, product utilization and features, see 3863, 3864, 3865, 3872, 3874 and M 2700 pages.

Supplies: For customer-owned diskettes

PREREQUISITES

Communication with a virtual storage host S/370 or 4300 processor is via a 3704, 3705 or Communications Adapter on 4331 Processor equipped with appropriate features ... see 3704, 3705 or 4331 pages.

A 3604 Keyboard Display mdl 6 or its equivalent is required as a control station and is directly attached to the controller. Two 10-foot cables will be supplied with the 3631. The magnetic stripe features are not supported.

The 3631 Controller and 3604 control terminal have been designed for operation in physical environments characteristic of office areas. See *IBM 3630 Plant Communication System - Installation Manual - Physical Planning, GA24-3675*.

One host communication feature: #6301, #6302 or #4502 is required ... see "Special Features."

A 3630 Test Loop #9445 is required for installation with the first 3631 at each site ... see "Specify."

Two wrap type Loop Station Connectors are required for each local adapter (#4780).

3631/3632 programming support material must be ordered from PID and installed on the host processor.

Loop Continuity and Relay Testers, Part No. 1657420, should be purchased by the customer for testing his loop wiring. One tester should be available at each physical location of controller(s) loops or remote loop(s) that will require loop cable testing.

Telephone communication should be available at the controller site for communication with the host, remote loops and key locations along loops.

A 3643 Keyboard Display terminal should be located in close physical proximity to 3842 Loop Control Units for remote loop and connected terminal testing.

Bibliography: IBM 3630 Plant Communication System - System Description, GA24-3652 ... IBM 3630 Plant Communication System - Installation Manual - Physical Planning, GA24-3675 ... IBM 3630 Plant Communication System - Loop Installation Manual - Physical Planning, GA24-3676 ... IBM 3630 Plant Communication System: Controller Operating Guide, GA24-3678.

SPECIFY

- Voltage** (115 V AC, 1 phase, 60 Hz, 1.8 meter (6 foot) cable; #9880 for locking plug, or #9881 for non-lock plug. These are usable on 120 V AC systems. **Field Installation:** Not recommended.
- Distribution of Microcode:** One copy of the 3631 or 3632 System Microcode is required for each S/370 attaching a 3631 or 3632. The address for the initial shipment must be supplied as a Supplementary Specification

Specify: #9491 for initial 3630 System ordered for attachment to the S/370 or, #9492 for any additional 3630 system ordered for attachment to the S/370.

For distribution of microcode to the S/370 location specify the media:

#9412	9/800 magnetic tape
#9413	9/1600 magnetic tape
#9414	9/6250 magnetic tape
#9431	80 column card
#9432	96 column card

Shipping address for the 3630 System microcode must be supplied

3631 Plant Communication Controller (cont'd)

This is the address to which the microcode will be automatically sent for the 3630 System (designated #9491). Whenever a 3630 is updated by an EC, the microcode will be sent to the current TPC# address. The TPC# (Teleprocessing Control Number)

- **Loop Accessories and Loop Cable:** 10 Loop Accessory Keys are shipped with the 3631. See M 10000 pages for descriptions, prices and ordering instructions for 3630 System Accessories.
- **3630 Test Loop:** Specify #9445 on the first 3631 or 3632 to be installed at each site. **Field Installation:** Yes.

	Mdl	MRC	MLC 2 Yr	Purchase	MMMC
3631	1A	\$993	\$845	\$26,300	\$224
	1B	1,058	900	28,300	247

Plan Offering: Plan B Purchase Option: 55% Per Call: 1
Machine Group: D Warranty: B Useful Life Category: 2
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Model 1A can be changed to Model 1B in the field. Change from Model 1A to 1B requires replacement of the diskette storage device. Adequate provision must be made for retaining data contained on the diskette by having the customer remove it prior to the start of any conversion.

MODEL UPGRADE PURCHASE PRICE: All replaced parts become the property of IBM ... there are no additional installation charges.

Model 1A to Model 1B\$2,000.

SPECIAL FEATURES

ADDITIONAL STORAGE FEATURE (#1006). Provides an additional 16,384 byte increment of storage for device attachment or application storage. To determine the number and type of storage features required see the configurator in the 3630 Plant Communication System Description. **Specify: #9591** for Additional Device Attachment Control Storage, or **#9592** for Additional Application Storage. **Maximum:** Five ... one with specify #9591, up to four with specify #9592. **Field Installation:** Yes. **Note:** The quantity of feature #1006s must equal the combined quantities of specify #9591 and #9592(s).

HOST COMMUNICATIONS FEATURES

For communication with the host processor, each 3631 must be equipped with EIA/CCITT - Host (#3701) and one of the following SDLC features: #4502, #6301, #6302.

EIA/CCITT INTERFACE - HOST (#3701). Provides the appropriate cables and interface logic necessary to attach an external modem for communication to the host processor through the 3704, 3705 or Communications Adapter on 4331 Processor or for local attachment to the 3704, 3705 or Communications Adapter on 4331 without requiring modems. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** A Communications Feature (#4502, 6301 or 6302).

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#4502). Required for attachment to communication lines through an external modem which provides clocking at speeds up to 9600 bps. **Maximum:** One. **Limitation:** Cannot be installed with #6301 or #6302. **Field Installation:** Yes. **Prerequisite:** EIA/CCITT Interface - Host (#3701).

HOST COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCKING (#6301). Required for attachment to communication lines through any external modem which does not provide clocking for speeds of 600, 1200 and 2400 bps, or for local attachment to the 3704, 3705 or Communications Adapter on 4331 Processor. See Feature #4716 under "Special Features" for the 3704 or 3705, or 4331 pages. **Maximum:** One. **Limitation:** Cannot be installed with #6302 or #4502. **Field Installation:** Yes. **Prerequisite:** EIA/CCITT Interface - Host (#3701).

HOST COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#6302). Required for attachment to communication lines through an external modem which provides clocking at speeds up to 4800 bps. **Maximum:** One. **Limitation:** Cannot be installed with #6301 or #4502. **Field Installation:** Yes. **Prerequisite:** EIA/CCITT Interface - Host (#3701).

TERMINAL ATTACHMENT

The Data Link Adapter (#3211), Loop Adapter (#4780), and EIA/CCITT Interface (#3703) features enable the 3631 Controller to attach 3640 terminals. Data Link terminal attachment capability is provided by selection of the EIA/CCITT Interface - Data Link (#3703) with the Data Link Adapter (#3211). Direct terminal attachment capability is provided by selection of the Loop Adapter (#4780) and the Data Link Adapter (#3211). A maximum of two directly attached loops and two data links for attachment of 3842s may be installed.

The data links are used to provide point-to-point or multipoint facilities for the connection of the 3842 Loop Control Units. The 3842 attaches at the remote ends of the data link where it establishes a remote loop. The 3872 Modem connects the EIA/CCITT Interface - Data Link (#3703) and the data link at the controller. The loop operates at the same speed as the data link.

Customer Responsibilities for Loops: The customer must purchase, install, and maintain loops for terminal attachment. See IBM 3630 Plant Communication System Description for further information. See IBM 3630 Plant Communication System Loop Installation Manual - Physical Planning for further planning and installation information on loop components, loop cable, loop wiring configurations, Continuity and Relay Tester, and maintenance and test procedure. See M 10000 pages for bulk cable and accessories.

DATA LINK ADAPTER (#3211). Provides the control logic to establish SDLC communications for terminal attachment. **Maximum:** Four. **Field Installation:** Yes. **Prerequisite:** Required once for each Loop Adapter (#4780) and once for each EIA/CCITT Interface - Data Link (#3703).

EIA/CCITT INTERFACE - DATA LINK (#3703). Provides an EIA/CCITT interface for attachment of a 3872 Modem for the connection of the 3842. **Maximum:** Two. **Field Installation:** Yes. **Prerequisite:** Data Link Adapter (#3211). **Limitation:** The sum of the bps operating rates for all EIA/CCITT Interfaces (#3701 and #3703) and the Loop Adapters (#4780) may not exceed 28,800 bps.

LOOP ADAPTER (#4780). Allows direct attachment of a loop with one or two loops to the controller operating at a speed of 9600 bps. **Maximum:** Two. **Field Installation:** Yes. **Prerequisite:** Data Link Adapter (#3211), and a wrap type Loop Station Connector in each connected lobe.

	MRC	MLC 2 Yr	Purchase	MMMC
Add'l Storage Feature #1006	\$58	\$49	\$1,170	\$10.00
Data Link Adapter 3211	35	30	1,200	10.50
EIA/CCITT Interface				
Host 3701	12	10	424	4.00
Data Link 3703	12	10	424	4.00
Loop Adapter 4780	31	26	940	17.50
SDLC/Host Communications Feature				
w/o Clkg to 9600 bps 4502	35	30	1,200	10.50
w Clkg to 2400 bps 6301	19	16	710	3.00
w/o Clkg to 4800 bps 6302	12	10	477	2.50

**IBM 3632 PLANT COMMUNICATION
CONTROLLER**

Purpose: A programmable controller for attachment of 3640 terminals to S/370 or 4300 processors using appropriate virtual storage system control programs, or an 8100 System using the Distributed Processing Program Executive (DPPX).

S/370 or 4300 Processor attachment is via a 3704, 3705 or Communications Adapter on 4331 Processor using Synchronous Data Link Control (SDLC) transmission protocols over various common carrier or user-owned transmission facilities. Communication is also possible via a Communications Adapter feature on the 4331 Processor (Note: This is not supported by ACF/VTAME).

8100 System attachment is via the 8130, 8140 and/or the 8101 data link using SDLC transmission protocols over various common carrier or user-owned transmission facilities.

Terminal attachment is via directly attached or data link attached loops. The loops are user-owned transmission facilities which are constructed from IBM accessories ... see "3630 Loop Accessories" in M 10000 pages. The loops are connected via common carrier or user-owned transmission facilities.

Model 1A A programmable controller with a 5 megabyte disk.

Model 1B A programmable controller with a 9.2 megabyte disk.

Highlights: Controls the functions of a 3630 Plant Communication System. Customers, utilizing SCP programs on virtual storage S/370, 4300 Processor or 8100 Systems, will prepare user-written application programs which direct system operation. The controller can be programmed to operate independently when the processor is unavailable. It is capable of controlling terminal functions, executing arithmetic and logic functions, and capturing data from the terminals for later transmission to the processor. Information may be stored on the disk for use in responding to terminal inquiries.

It houses a disk storage device (5 or 9.2 Mb capacity) for storage of user data. This storage device is not removable except by service personnel. A fixed head feature is available which will provide 8 additional heads with access to data on 8 tracks ... see Additional Disk Heads (#1010, 1011) under "Special Features."

Houses a direct access diskette drive which accepts both IBM Diskette 1 and 2 having respectively 250K and 500K byte capacities. The diskette provides permanent storage for control code and application programs, plus permanent and temporary storage for user data. Data required to be on the diskette, exclusive of customer data, will often exceed 200K bytes. During normal operation performance characteristics of the diskette drive dictate that the device be used primarily for infrequent data logging.

IBM and customer code is transmitted to the controller where it is written on a diskette. The diskette may also be used to hold application data in the space not required for the control code. At controller start-up, diagnostics, control code and application code are read from the diskette into control and application storage. During system operation, both the disk and the diskette may be used to access data and code.

Storage included in the controller is used for control code, and application control data and instructions. The amount of storage available for application programming depends on the attached terminal configuration and user environment. Included in the basic machine is 65,536 bytes of application storage. Both control and application storage may be extended in 16 384 byte increments ... see "Special Features."

All 3640 terminals are attached to customer-owned loops. A variety of accessories and wire are available for the construction of the loops ... see "3630 Accessories" in the M 10000 pages. Up to two Loop Adapters may be installed to directly connect one loop each. The Loop Adapters each provide two loop lobes. Each lobe may extend up to 3.2 cable kilometers (2 cable miles). Directly attached loops are operated at 9600 bps. A loop, consisting of one lobe, may be connected to the 3842 Loop Control Unit. The 3842 can be connected multipoint or point-to-point on a common carrier or customer-owned transmission facility to a 3872 Modem at the 3632 site for operation at 2400 bps. A loop can accommodate a number of loop-terminal connections ... see *3630 Plant Communication System Description* for additional information.

Communication with a host S/370 or 4300 processor is via a 3704, 3705 or Communications Adapter on 4331 Processor using SDLC and SNA protocols. The EIA/CCITT Interface - Host (#3701), and either an external modem or the Line Set Type 1F (#4716) on the 3704/3705 (on 4331, the Local Attachment Interface [#4801] feature) are required for host communication. See M 2700 and M 4331 pages for Communications Adapter features on 4331. Each 3632 operates in half-duplex mode. Du-

plex communication line operations are possible with multiple 3631s and 3632s attached to the line ... one 3631/3632 transmitting while the other receives.

Communication with an 8100 System is via the 8130, 8140 and/or the 8101 data link using the SDLC protocol. The EIA/CCITT Interface - Host (#3701) on the 3632 is used on an SDLC data link or the direct connect facility provided by the 8100. Each 3631 operates in half-duplex mode.

The following IBM external modems can be used:

3863 mdl 1	2400/1200 bps - non-switched
3864 mdl 1	4800/2400 bps - non-switched
3865 mdl 1 or 2	9600/4800 bps - non-switched
3872 mdl 1	2400/1200 bps - non-switched
3874 mdl 1	4800/2400 bps - non-switched

Note: 4-wire Switched Network Backup is available on the 3863 mdl 1, 3864 mdl 1 and 3865 mdl 1 or 2. For communications capabilities, product utilization and features, see 3863, 3864, 3865, 3872, 3874 and M 2700 pages.

Supplies: customer-usable diskettes

Prerequisites:

Communications with a virtual storage S/370 or 4300 Processor is via a 3704, 3705 or Communications Adapter on 4331 Processor equipped with appropriate special features ... see 3704/3705 or 4331 pages.

Communications with the 8100 System is via the 8130, 8140 and/or the 8101 data link using the appropriate features ... see 8130, 8140 and 8101. When ordering this machine for installation to an 8100 System, "Terminal Requirements" under 8130, 8140 and 8101 in "Machines" should be reviewed.

A 3604 Keyboard Display mdl 6, or its equivalent, is required as a control station and is directly attached to the controller. Two 10 foot connecting cables will be supplied with the 3632. The magnetic stripe optional features on the 3604 are not supported.

The 3632 Plant Communication Controller and 3604 Keyboard Display mdl 6 have been designed for operation in physical environments characteristic of office areas. See *IBM 3630 Plant Communication System - System Description Manual* for further information.

One host communication feature (#6301, 6302 or 4502) is required ... see "Special Features."

Two wrap type Loop Station Connectors for each Loop Adapter (#4780).

A 3630 Test Loop (#9445) for installation with the first 3632 at each site ... see "Specify."

3631/3632 programming support material must be ordered from PID and installed on the host processor.

Loop Continuity and Relay Testers, P/N 1657420, should be purchased by the customer for testing his loop wiring. One tester should be available at each physical location of controller(s) loops or remote loop(s) that will require loop cable testing.

Telephone communication should be available at the controller site for communication with the host, remote loops and key locations along loops.

A 3643 Keyboard Display terminal should be located in close physical proximity to 3842 Loop Control Units for remote loop and connected terminal testing.

Bibliography: IBM 3630 Plant Communication System - System Description, GA24-3652 ... IBM 3630 Plant communication System - Installation Manual - Physical Planning, GA24-3675 ... IBM 3630 Plant Communication System - Loop Installation Manual - Physical Planning, GA24-3676 ... IBM 3630 Plant Communication System: Controller Operating Guide, GA24-3678.

SPECIFY

- **Voltage** (AC, 1-phase, 60 Hz): 115 V (usable on 120 V) -- #9880 for locking plug, or #9881 for non-lock plug. 208 V -- #9884 for locking plug, or #9885 for non-lock plug. 230 V -- #9886 for locking plug, or #9887 for non-lock plug. **Field Installation:** Not recommended.
- **Distribution of Microcode:** One copy of the 3631 or 3632 System Microcode is required for each S/370 attaching a 3631 or 3632. The address for the initial shipment must be supplied as a Supplementary Specification via AAS as shown below.
Specify #9491 for initial 3630 system ordered for attachment to the S/370, or #9492 for any additional 3630 system ordered for attachment to the S/370.



3632 Plant Communication Controller (cont'd)

For distribution of microcode to the S/370 location specify the media;

#9412	9/800 magnetic tape
#9413	9/1600 magnetic tape
#9414	9/6250 magnetic tape
#9431	80 column card
#9432	96 column card

Shipping address for the 3630 system microcode must be supplied

This is the address to which the microcode will be automatically sent for the 3630 System (designated #9491). Whenever a 3630 is updated by an EC, the microcode will be sent to the current TPC# address. the TPC# (Teleprocessing Control Number)

- **Loop Accessories and Loop Cable:** 10 Loop Accessory Keys are shipped with the 3632. See M 10000 pages for descriptions, prices, and ordering instructions for 3630 System Accessories.

3630 Test Loop: Specify #9445 on the first 3631 or 3632 to be installed at each site. **Field Installation:** Yes.

PRICES	mdl	MRC	MLC 2 Yr	Purchase	MMMC
	1A	\$1,533	\$1,305	\$44,600	\$273
	1B	1,622	1,380	47,600	281

Plan Offering: Plan B Purchase Option: 55% Per Call:1
Machine Group: D Warranty: B Useful Life Category: 2
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Upper Limit percent: 5%

Model Changes: Model 1A can be changed in the field to Model 1B ... requires replacement of the disk storage device. Adequate provision must be made for retaining data contained on the disk and for removal of any proprietary data prior to the start of the conversion. **Limitation:** Field installation of the additional disk heads for Model 1B (#1011) concurrently with a model change from Model 1A to Model 1B requires submission of an RPQ.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges ... all replaced parts become the property of IBM.)

Model 1A to Model 1B \$3,000.

SPECIAL FEATURES

ADDITIONAL STORAGE FEATURE (#1006). Provides an additional 16,384 byte increment of storage for device attachment or application storage. To determine the number and type of storage features required, see the Configurator in the *IBM 3630 Plant Communication System Description Manual*. **Specify: #9591** for additional device attachment control storage, or **#9592** for additional application storage. **Maximum:** #1006 with #9591 specified - 1 ... #1006 with #9592 specified - 4 ... a maximum of five #1006s. **Note:** The quantity of #1006s must equal the combined quantities of specify codes #9591 and #9592. **Field Installation:** Yes.

ADDITIONAL DISK HEADS (#1010 for mdl 1A, #1011 for mdl 1B). Provides eight additional disk heads for the disk file, as specified by model type selected. **Maximum:** One. **Field Installation:** Not recommended.

HOST COMMUNICATION FEATURES ... For communications with the host processor, each 3632 must be equipped with EIA/CCITT interface - Host (#3701) and one of the following Communications features ... #4502, #6301 or #6302.

EIA/CCITT INTERFACE - HOST (#3701). Provides the appropriate cables and interface logic necessary to attach an external modem for communications to the host processor through the 3704/3705 or for local attachment to the 3704/3705 without requiring modems. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Communications Feature (#4502, 6301 or 6302).

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#4502). Required for attachment to communication lines through an external modem which provides clocking at speeds up to 9600 bps. **Maximum:** One. **Limitation:** Cannot be installed with #6301 or #6302. **Field Installation:** Yes. **Prerequisite:** EIA/CCITT Interface - Host (#3701).

HOST COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCKING (#6301). Required for attachment to communication lines through any external modem which does not provide clocking for speeds of 600, 1200 and 2400 bps, or for local attachment to the 3704/3705 ... see Line Set Type 1F (#4716) under "Special Features" for the 3704 or 3705. **Limitation:** Cannot be installed with #6302 or #4502. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** EIA/CCITT Interface - Host (#3701).

HOST COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#6302). Required for attachment to communication lines through an external modem which provides clocking at speeds up to 4800 bps. **Maximum:** One. **Limitation:** Cannot be installed with #6301 or #4502. **Field Installation:** Yes. **Prerequisite:** EIA/CCITT Interface - Host (#3701).

TERMINAL ATTACHMENT: The Data Link Adapter (#3211), Loop Adapter (#4780), and EIA/CCITT Interface (#3703) features enable the 3632 Controller to attach 3640 terminals. Data link terminal attachment capability is provided by selection of the EIA/CCITT Interface - Data Link (#3703) with the Data Link Adapter (#3211). Direct terminal attachment capability is provided by selection of the Loop Adapter (#4780) and the Data Link Adapter (#3211). A maximum of two directly attached loops and two data links for attachment of 3842s may be installed.

The data links are used to provide point-to-point or multi-point facilities for the connection of the 3842 Loop Control Units. The 3842 attaches at the remote ends of the data link where it establishes a remote loop. The 3872 Modem connects the EIA/CCITT Interface - Data Link (#3703) and the data link at the controller. The loop operates at the same speed as the data link.

CUSTOMER RESPONSIBILITIES FOR LOOPS -- The customer must purchase, install and maintain loops for terminal attachment ... see *IBM 3036 Plant Communication System Description Manual* for further information. See *IBM 3630 Plant Communication System Loop Installation Manual - Physical Planning* for further planning and installation information on loop components, loop cable, loop wiring configurations, Continuity and Relay Tester, and maintenance and test procedures. See M 10000 pages for bulk cable and accessories.

DATA LINK ADAPTER (#3211). Provides the control logic to establish SDLC communications for terminal attachment. **Prerequisite:** Required once for each Loop Adapter (#4780) and once for each EIA/CCITT Interface - Data Link (#3703). **Maximum:** Four. **Field Installation:** Yes.

EIA/CCITT INTERFACE - DATA LINK (#3703). Provides an EIA/CCITT interface for attachment of a 3872 Modem for the connection of the 3842. **Field installation:** Yes. **Maximum:** Two. **Prerequisite:** Data Link Adapter (#3211). **Limitation:** The sum of the bps operating rates for all EIA/CCITT Interfaces (#3701 and #3703) and the Loop Adapters (#4780) can not exceed 28,800 bps.

LOOP ADAPTER (#4780). Allows direct attachment of a loop with one or two lobes to the controller operating at a speed of 9600 bps. **Maximum:** Two. **Field Installation:** Yes. **Prerequisite:** Data Link Adapter (#3211), and a wrap type Loop Station Connector in each connected lobe.

Special Feature Prices:	MRC	MLC 2 Yr	Purchase	MMMC
Add'l Storage Feature #1006	\$58	\$49	\$1,170	\$10.00
Add'l Disk Heads				
For Model 1A	1010	32 27	1,080	17.00
For Model 1B	1011	32 27	1,080	17.00
Data Link Adapter	3211	35 30	1,200	10.50
EIA/CCITT Interface				
Host	3701	12 10	424	4.00
Data Link	3703	12 10	424	4.00
Loop Adapter	4780	31 26	940	17.50
SDLC Communications Feature				
w/o clk to 9600 bps	4502	35 30	1,200	10.50
with clk to 2400 bps	6301	19 16	710	3.00
w/o clk to 4800 bps	6302	12 10	477	2.50

IBM 3641 REPORTING TERMINAL

Purpose: The 3641 Reporting Terminal models 1 and 2 are interactive workstations with a wide range of options to meet individual customer requirements for data entry and response.

- Model 1** Has a 22-character alphameric display. Either a 35-key numeric keyboard or 70-key alphameric keyboard feature must be specified. Optional features include a Magnetic Reader Attachment and a Digital Input/Digital Output with 32 input and 8 output points.
- Model 2** Has a 22-character alphameric display. Either a 35-key numeric keyboard or 70-key alphameric keyboard feature must be specified. Optional features include a Magnetic Reader Attachment, a Numeric Punched Hole Badge Reader, an 80-column Punched Card Reader, and Digital Input/Digital Output with 32 input and 8 output points.

HIGHLIGHTS

The 3641 is an interactive workstation terminal that is designed to be used on a table, counter, work bench or mounted via an accessory bracket on a wall or column. Its capability includes:

- An easy-to-read display for input verification of keyed data and alphameric operator messages of up to 22 characters.
- Display of alphameric and special characters.
- Function keys for user-defined transactions.
- Special features for fixed data input include: A 10-column numeric punched hole badge reader, an 80-column card reader, and a magnetic character reader adapter.
- A Digital Input/Output feature for exchange of data between the 3641 and customer devices.
- A removable keyboard overlay and function key mask which can be customized by the customer.

Supplies; 80-column cards ... Punched Hole Badges ... Magnetic Stripe Badges.

These supplies, if required, may be ordered through IBM

PREREQUISITES

1. Either the 35-key Numeric Keyboard (#4652) or the 70-key Alphameric Keyboard (#4653) must be specified on both 3641 Models 1 and 2.
2. A Loop Station Connector on a 3631/3632 or 3842 or 8100 System Loop.
3. The Punched Card/Punched Badge Adapter (#5781) must be specified if either Numeric Punched Hole Badge Reader (#5810) or 80-column Punched Card Reader (#5802) is specified. [Model 2 only]
4. Magnetic Reader Attachment (#4910) must be specified if either the Magnetic Hand Scanner, Magnetic Slot Reader, or *Dual Entry Magnetic Slot Reader* is ordered. See "Special Features."

When ordering this machine for attachment to an 8100 System, "Terminal Requirements" under the appropriate 8130, 8140 or 8101 pages in "Machines" should be reviewed.

Bibliography: 3630 Plant Communication System - System Description, GA24-3652 ... 3641 Reporting Terminal Operating Guide, GA24-3679, or Introduction to 8100 System.

Customer Setup: The 3641 is designated customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibility: The customer is responsible for:

- Unpacking, placement, setup and checkout of the 3641 at time of delivery or when relocating the 3641.
- Removing and packing of the 3641 at time of discontinuance.
- Using and following the problem determination procedures and filling out the trouble report prior to calling for service.
- Relocation of the 3641 (if required) to allow IBM service access.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operations to determine:

- Whether or not continued operation is possible.
- Whether terminal, controller, accessory or media is at fault.

Proper terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement applies to the 3641 terminal.

Maintenance of the 3641 terminals will normally be performed at the installed location.

There is no regularly scheduled IBM preventive maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMMC in prices.

Maintenance courses are offered to the customer for a separate charge.

Physical Environments

The 3641, Models 1 and 2, and accessories may be used in the industrialized work zones of a wide range of business, industrial and commercial establishments.

They can resist:

- Concentrations of certain common, corrosive gases.
- Accumulations of dust, grit, and dirt.
- Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
- Most industrial types of electromagnetic interference associated with terminal operational sites.
- Vibration and shock associated with the shipping, operation, and relocation of the terminal for most types of industries.

For environmental specifications refer to the *IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675*.

SPECIFY

- **Voltage** (120 V AC, 1-phase, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug.
- **Power Cable:** #9986 for 1.8 meter (6 foot) cable, or #9987 for 4.3 meter (14 foot) cable.
- **Loop Connection Cable:** #9976 for 1.8 meter (6 foot) cable, or #9976 for 4.3 meter (14 foot) cable.
- **Color:** #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

	Mdl	MLC 5 Yr	Purchase*	MMMC
3641	1	\$91	\$2,955	\$13.50
	2	107	3,530	15.00

Maintenance: A Per Call: 1 Purchase Option: 55%
Useful Life Category: 2 Warranty: B Upper Limit Percent: 5%
Termination Charge Months: 6 Termination Charge Percent: 20%

Model Changes: Available at time of manufacture only.

SPECIAL FEATURES

DIGITAL INPUT/DIGITAL OUTPUT (#3251). Provides 32 bits of TTL compatible digital input and 8 bits of TTL compatible digital output on the 3641 model 1 and 2. **Maximum:** One. **Field Installation:** Yes.

35-KEY NUMERIC KEYBOARD (#4652). Provides 15 customer-defined function keys, 5 control keys, 10 numeric keys and 5 special character keys. **Limitation:** Cannot be installed with #4653. **Maximum:** One. **Field Installation:** Available at time of manufacture only.

70-KEY ALPHAMERIC KEYBOARD (#4653). Provides 20 customer-defined function keys, 5 control keys, 10 numeric keys, A-Z, and 9 special character keys. **Limitation:** Cannot be installed with #4652. **Maximum:** One. **Field Installation:** Available at time of manufacture only.

MAGNETIC READER ATTACHMENT (#4910). Used to attach a Magnetic Hand Scanner, Magnetic Slot Reader, or *Dual Entry Magnetic Slot Reader* to the 3641 model 1 and 2. **Note:** The three magnetic readers are plug compatible. **Limitation:** Cannot be installed with both #5801 and #5802 on the model 2. **Maximum:** One. **Field Installation:** Yes.

PUNCHED CARD/PUNCHED BADGE ADAPTER (#5781). [Model 2 only] Required if either Numeric Punched Hole Badge Reader (#5801) or 80-Column Punched Card Reader (#5802) is specified. **Maximum:** One. **Field Installation:** Not recommended.

* Pilot Test Plan applies.

**3641 Reporting Terminal (cont'd)**

NUMERIC PUNCHED HOLE BADGE READER (#5801). [Model 2 only] Provides a badge reader which can read up to 10 digits of numeric information. **Maximum:** One. **Field Installation:** Not recommended. **Prerequisite:** Punched Card/Punched Badge Reader Adapter (#5781). **Limitation:** Cannot be installed with both #4910 and #5802.

80-COLUMN PUNCHED CARD READER (#5802). [Model 2 only] Allows the reading of 80-column tab cards. **Limitation:** Cannot be installed with both #4901 and #5801. **Maximum:** One. **Field Installation:** Not recommended. **Prerequisite:** Punched Card/Punched Badge Adapter (#5781).

Special Feature Prices:	MLC			
		5 Yr	Purchase	MMMC
Digital Inpt/Digital Outpt #3251	\$17	\$510	\$3.00	
35-Key Keyboard 4652	8	163	2.50	
70-Key Keyboard 4653	11	288	3.00	
Magnetic Rdr Attachmt 4910	10	318	1.50	
Pnchd Card/Pnchd Badge Adapter 5781	5	136	1.00	
Num Pchd Hole Bdg Rdr 5801	24	829	3.00	
80-Col Punched Card Rdr 5802	28	815	6.00	

Accessories: The following items are available on a purchase only basis. For shipment with machine, order the Feature Number and quantity as shown below at the price listed in the M 10000 pages. See M 10000 for additional information and for ordering

Item	Feature Number	Maximum Qty
Magnetic Hand Scanner	#9440	*
Magnetic Slot Reader	9441	*
Dual Entry Mag Slot Reader	9442	*
Mounting Bracket	9450	1
Magnetic Reader Extension Cable ... for use with Magnetic Hand Scanner or Magnetic Slot Reader		
6 meter	9106	**
12 meter	9107	**

* A maximum of one magnetic reader or scanner may be ordered.

** A maximum of one extension cable may be ordered.



IBM 3642 ENCODER PRINTER

Purpose: A work station printer and magnetic stripe encoder which produces turn around documents. The magnetic stripe on the documents encoded by the 3642 can be read by the Magnetic Hand Scanner and the Magnetic Slot Reader.

Model 1 Has ten print lines and allows hand feed operation.

Model 2 Has ten print lines and allows the automatic feeding of continuous forms as well as hand feed operations.

Model Changes: Available at time of manufacture only.

Highlights

The 3642 is designed to produce magnetic stripe documents at a workstation. Its capability includes:

- Prints and encodes magnetic striped cards and labels.
- Prints 10 lines of up to 70 alphanumeric characters each.
- Encodes alphanumeric data.
- Hand feed or automatic feed documents.
- Large printed-character option.

Automatic Feeding and Bursting: The model 2 automatic feed and burst capability permits unattended operation. It provides a forms burster and a hopper which holds up to 400 continuous forms. A forms stacker which holds up to 400 cut forms is standard on both models. All continuous forms on the model 2 are automatically burst prior to encoding and printing.

The automatic feed and burst capability is designed to burst 99 pound card stock and adhesive backed labels. It is not designed to burst 150 pound tag stock.

Document Speed: The document speed depends upon the data printed and the forms size and will have to be evaluated for each application. The machine speed for a typical document is eight documents per minute.

Document Description: The 3642 contains a printer and magnetic stripe encoder that can print and encode on the following documents.

Document Sizes: Height -- 8.26cm (3.25 in) ... Length -- Min: 12.7cm (5.0 in) ... Length -- Max: 18.733cm (7.375 in).

Document Types 99 pound card stock ... 150 pound white tag stock ... pressure sensitive labels.

Document Thickness: Min. 0.018cm (0.007 in) ... Max: 0.030cm (0.011 in).

See *Forms Design Reference Guide, GA24-3488* for more details on the 3642 forms.

Character Sets: The 48 printed character set consists of 0-9, A-Z, and special characters period (.), single quote ('), plus (+), ampersand (&), dollar sign (\$), asterisk (*), hyphen or minus (-), slash (/), comma (,), percent (%), at sign (@) and number sign (#)

A special (Large Character) 48-character set available at time of manufacture provides 0-9, A-Z, slash(/), minus (-) and decimal (.) and 9 special characters for creating large printed characters ... see "Specify." Also see *3630 Plant Communications System Description* for details.

The large character set has two options ... see "Specify."

Large-character printing on the first 4 lines only - standard printing on the last 6 lines.

Large-character printing on all 10 lines.

Supplies: Magnetic striped forms ... an ink roll (part No. 457380), or equivalent.

These supplies may be ordered through IBM

Prerequisite: A Loop Station Connector on a 3631/3632 or 3842, or 8100 System loop.

When ordering this machine for attachment to an 8100 System, "Terminal Requirements" under the appropriate 8130, 8140 or 8101 pages in "Machines" should be reviewed.

Bibliography:

- 3630 Plant Communication System - System Description, GA24-3652
- 3642 Encoder Printer Operating Guide, GA24-3680
- Forms Design Reference Guide for Printers, GA24-3488
- Introduction to 8100 System.

Customer Setup: The 3642 is designated customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibility: The customer is responsible for:

- Unpacking, placement, setup and checkout of the 3642 at time of delivery or when relocating the 3642.
- Removing and packing of the 3642 at time of discontinuance.
- Using and following the problem determination procedures and filling out the trouble report prior to calling for service.
- Relocation of the 3642 (if required) to allow IBM service access.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operation to determine:

- Whether or not continued operation is possible.
- Whether terminal, loop, controller, accessory, or media is at fault.

Proper terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement applies to the 3642.

Maintenance of the 3642 terminals will normally be performed at the installed location. See

There is no regularly scheduled IBM preventive maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMMC in prices.

Maintenance courses are offered to the customer for a separate charge.

Physical Environments

The 3642 models 1 and 2 may be used in the industrialized work zones of a wide range of business, industrial and commercial establishments.

They can resist:

- Concentrations of certain common, corrosive gases.
- Accumulations of dust, grit, and dirt.
- Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
- Most industrial types of electromagnetic interference associated with terminal operational sites.
- Vibration and shock associated with the shipping, operation, and relocation of the terminal for most types of industries.

For environmental specifications refer to the *IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675*.

SPECIFY

- **Voltage** (120 V AC, 1-phase, 60 Hz) **#9890** for locking plug, or **#9891** for non-lock plug. **Note:** 120 V AC is compatible with existing 115 V systems. **Field Installation:** Not recommended.
- **Power Cable:** **#9986** for 1.8 meter (6 foot) cable, or **#9987** for 4.27 meter (14 foot) cable.
- **Loop Connection Cable:** **#9976** for 1.83 meter (6 foot) cable, or **#9977** for 4.27 meter (14 foot) cable.
- **Character Set Groups:** *Specify one --* **#2956** for standard size character set, **#9401** for Large Character - Lines 1-4, or **#9402** for Large Character - Lines 1-10.
- **Color:** **#9063** for classic blue, **#9064** for charcoal brown, or **#9065** for pebble gray.

Mdl	MLC 5 Yr	Purchase*	MMMC
1	\$191	\$5,775	\$31.50
2	226	6,825	38.00

Maintenance: B Per Call: 1 Purchase Option: 55%
Useful Life Category: 2 Warranty: B Upper Limit Percent: 5%
Termination Charge Months: 6 Termination Charge Percent: 20%

* Pilot Test Plan applies.



IBM 3643 KEYBOARD DISPLAY

Purpose: A combination keyboard and gas panel display terminal for input and output in interactive 3630 Plant Communication System applications, and when attached to an 8100 System.

- Model 2** Displays 240 characters ... six rows of 40 characters. Keyboard consists of alphameric, control, and function keys.
- Model 3** Displays 480 characters ... twelve rows of 40 characters. Keyboard consists of alphameric, control, and function keys.
- Model 4** Displays 1024 characters ... sixteen rows of 64 characters. Keyboard consists of alphameric, control, and function keys.

Model Changes: Available at time of manufacture only.

Highlights

- Gas panel display with buffer.
- Keyboard options to meet input requirements.
- Operates with manufacturing application programs.
- Accesses control functions.

Prerequisites

- Either the Alphameric Keyboard (#4772) or the Expanded Alphameric Keyboard (#4774) must be selected to complete the order. See "Special Features."
- A Loop Station Connector on a 3631/3632 or 3842 loop, or 8100 System loop.
- Magnetic Attachment (#4910) must be ordered if the Magnetic Hand Scanner, Magnetic Slot Reader, or Dual Entry Magnetic Slot Reader is to be attached. See "Special Features."

When ordering this machine for attachment to an 8100 System, the section "Terminal Requirements" in the appropriate 8130, 8140 or 8101 pages in "Machines" should be reviewed.

Bibliography: IBM 3630 Plant Communication System - System Description, GA24-3652 ... IBM 3643 Keyboard Display Operating Guide, GA24-3631 ... Introduction to 8100 System.

Customer Setup: The 3643 is designated customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

- Unpacking, placement, set-up and checkout of the 3643 at time of delivery or when relocating the 3643.
- Removing and packing of the 3643 at time of discontinuance.
- Using and following the problem determination procedures and filling out the trouble report prior to calling for service.
- Relocation of the 3643 (if required) to allow IBM service access.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operations to determine:

- Whether or not continued operation is possible.
- Whether terminal, loop, controller, accessory, or media is at fault.

Proper terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement

applies to the 3643 terminals and accessories.

Maintenance of the 3643 terminals will normally be performed at the installed location.

There is no regularly scheduled IBM preventive maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMMC in "Prices" below.

Maintenance courses are offered to the customer for a separate charge.

Physical Environments: The 3643 mdls 2, 3 and 4 may be used in industrialized work zones of a wide range of business, industrial and commercial establishments. They can resist:

- Concentrations of certain common, corrosive gases.
- Concentrations of dust, grit and dirt.
- Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
- Most industrial types of electromagnetic interference associated with terminal operational sites.
- Vibration and shock associated with shipping, placement, operation and relocation of the terminal for most types of industries.

For environmental specifications refer to the *IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675.*

SPECIFY

- **Voltage** (120 V, AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. **Note:** 120 V AC is compatible with existing 115 V AC systems. **Field Installation:** Not recommended.
- **Power Cable:** #9986 for 1.8 meter (6 foot) cable, or #9987 for 4.3 meter (14 foot) cable.
- **Loop Connection Cable:** #9976 for 1.8 meter (6 foot) cable, or #9977 for 4.3 meter (14 foot) cable.
- **Color:** #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

PRICES:	Mdl	MLC 5 Yr	Purchase††	MMMC
3643	2	\$ 99	\$2,455	\$27.00
	3	133	3,400	33.50
	4	138	3,590	35.50

Maintenance: D Per Call: 1 Purchase Option: 55%
 Useful Life Category: 2 Warranty: B Upper Limit Percent: 5%
 Termination Chg Mnths: 6 Termination Chg Percent: 20

SPECIAL FEATURES

Keyboards -- all keyboards will have a combination of pre-engraved and non-engraved keytops. For the non-engraved function keys each 3643 will be provided with 3 sets of self-adhesive keytop labels. One set will be pre-printed with commonly used function nomenclature and will have a protective plastic coating applied. Also, a set of blank labels will be provided so that the user may create his own labels. A clear plastic overlay set will provide a protective cover for the blank label set.

ALPHAMERIC KEYBOARD (#4772). A 54-key alphameric section pre-engraved as a typewriter keyboard to the left of a function/transaction keypad. The function/transaction keypad consists of 12 engraved and 8 non-engraved keys. **Limitation:** Cannot be installed with Expanded Numeric Keyboard (#4774). **Maximum:** One. **Field Installation:** Available at time of manufacture only.

EXPANDED ALPHAMERIC KEYBOARD (#4774). The same as #4772, except that function/transaction keypad has 20 additional non-engraved keys. **Maximum:** One. **Limitation:** Cannot be installed with #4772. **Field Installation:** Available at time of manufacture only.

MAGNETIC ATTACHMENT (#4910). Permits attachment of a Magnetic Hand Scanner, Magnetic Slot Reader, or Dual Entry Magnetic Slot Reader. **Note:** The Magnetic Hand Scanner and Magnetic Slot Readers are plug compatible. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:		MLC 5 Yr	Purch	MMMC
Alphameric Keyboard	#4772	\$21	\$763	\$1.00
Expnd Alphameric Kybd	4774	26	932	1.50
Magnetic Attachment	4910	10	318	1.50

Accessories: The following items are available on a purchase only basis. For shipment with the machine order the Feature Number and quantity as shown below at the price listed in the M 10000 pages. See M 10000 pages for additional information and for ordering

Item	Feature Number	Maximum Qty
Magnetic Hand Scanner	9440	*
Magnetic Slot Reader	9441	*
Dual Entry Mag Slot Reader	9442	*
Magnetic Reader Extension Cable ... for use with Magnetic Hand Scanner or Magnetic Slot Reader		
6 meter	9106	**
12 meter	9107	**

* A maximum of one magnetic reader or scanner may be ordered.

** A maximum of one extension cable may be ordered.

†† Pilot Test Plan applies.



IBM 3644 AUTOMATIC DATA UNIT

Purpose: The 3644 attaches to the 3631 or 3632 controller, or 8100 system via its loop features to provide system connection to a variety of distributed sensors, actuators, and production and laboratory equipment.

Highlights:

The unit provides:

- Power and housing for Sensor I/O cards.
- Distributed attachment of user equipment.
- Analog and digital attachments.
- Bit serial asynchronous current loop.
- User defined scan controls, data transmission and logic processing.

Limitations: The analog input function requires multiple Sensor I/O cards. If analog input is installed, some card-socket usage restrictions exist. See M 10000 pages for details.

Accessories: See M 10000 pages for descriptions of the Sensor I/O cards.

Prerequisite: A Loop Station Connector on a 3631/3632 or 3842 loop, or 8100 System loop.

When ordering this machine for attachment to an 8100 system, the "Terminal Requirements" listed in the appropriate 8130, 8140 or 8101 pages in "Machines" should be reviewed.

Bibliography: IBM Plant Communication System - System Description, GA24-3652 ... IBM 3644 Automatic Data Unit - Component Description Manual, GA24-3653 ... IBM 3644 Automatic Data Unit - Programming Guide, GA24-5178 ... IBM 3644 Automatic Data Unit Operating Guide, GA24-3682.

Customer Setup: The 3644 is designated customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

- Unpacking, placement, set-up and checkout of the 3644 at time of delivery or when relocating the 3644; this includes the Sensor I/O cards.
- Removing and packing of the 3644 at time of discontinuance.
- Using and following the problem determination procedures of the 3644 and filling out the trouble report prior to calling for service.
- Executing the problem determination procedures for the Sensor I/O cards, determining the failing card, and mailing it to the honoring IBM location.
- Maintenance of the process sensors, actuators, and wiring.
- Determining and stocking spare Sensor I/O cards.
- Creating the parameter tables that direct the operation of the 3644.
- Installation and physical planning for the 3644. IBM assistance in determining the suitability of the industrial environment for the 3644 installation is available.
- Relocation of the 3644 (if required) to allow IBM service access.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operations to determine:

- Whether or not continued operation is possible.
- Whether terminal, loop, controller, sensor I/O cards, or media is at fault.

Proper terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement applies to the 3644 terminals.

Maintenance of the 3644 terminals will normally be performed at the installed location.

Warranty service of the Sensor I/O cards will be performed at the honoring IBM location. See M 10000 pages for details.

There is no regularly scheduled IBM preventative maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMMC in "Prices" below.

Maintenance courses are offered to the customer for a separate charge.

Physical Environments: The 3644 and its Sensor I/O cards have been designed to operate in the industrialized work zones of many types of establishments.

They can resist:

- Concentrations of certain common corrosive gases.
- Accumulations of dust, grit and dirt.
- Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
- Most industrial types of electromagnetic interference associated with terminal operational sites.
- Vibration and shock associated with the shipping operation and relocation of the terminal for most types of industries.

For environmental specifications refer to the IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675.

SPECIFY: [1] Voltage (120 V AC, 1-phase, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug. **Note:** 120 V AC is compatible with existing 115 V AC systems. **Field Installation:** Not recommended.

- [2] Power Cable: #9986 for 1.8 meters (6 foot) cable, or #9987 for 4.3 meters (14 foot) cable.
- [3] Loop Connection Cable: #9976 for 1.8 meters (6 foot) cable, or #9977 for 4.3 meters (14 foot) cable.
- [4] Color: #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.
- [5] Distribution of 3644 Microcode: One copy of the 3644 microcode for machines with feature #4905 and/or one copy of the 3644 microcode for machines without feature #4905 is required at each S/370 or 8100 system location. for the initial shipment must be supplied as a Supplementary

Specify:

- #9491 - for initial 3644 without MIO feature.
- #9492 - for initial 3644 with MIO feature (#4905).
- #9493 - for any additional 3644s.

For distribution of microcode to a S/370 location specify media:

- #9412 - 9/800 magnetic tape
- #9413 - 9/1600 magnetic tape.
- #9414 - 9/6250 magnetic tape.

For distribution of microcode to an 8100 system location specify media:

- #9415 - Diskette 1.

PRICES:	Mdl	MLC 5 Yr	Purchase* MMMC
3644	1	\$174	\$5,240 \$34

Machine Group: D Per Call: 1 Purchase Option: 55%
 Useful Life Category: 2 Warranty: B Upper Limit Percent: 5%
 Termination Chg Mnths: 6 Termination Chg Percent: 20%

SPECIAL FEATURES

MANUAL I/O (#4905). Provides a 22-character display and a 35-key numeric/function keypad. Allows inquiry into customer data and status contained in 3644 storage when online to the 3630 system. When offline, additionally allows modification of customer data locations to effect operator control of 3644 operation.

Special Feature Prices:	MLC 5 Yr	Purchase MMMC
Manual I/O	#4905 \$45	\$1,480 \$6.50

Accessories: The following items are available on a purchase only basis. For shipment with the machine order the Feature Number and quantity as shown below at the price listed in the M 10000

* Pilot Test Plan applies.

3644 Automatic Data Unit (cont'd)

pages. See M 10000 pages for additional information and for ordering by MES.

Item	Feature Number	Maximum Qty
16 Point Isolated DI	#9142	*
16 Point Non-isolated DI	9143	*
16 Point Isolated DO	9151	*
16 Point Non-isolated DO	9144	*
8 Point Reed Relay Mltplx	9145	*
Analog to Digital Converter	9146	*
Current Loop	9141	*
Process Termination Block	9147	**
Socket Cover	9148	**

* A maximum of 8 sensor I/O cards can be ordered. See IBM 3644 Component Description Manual - Appendix C, GA24-3653, for configuration limitations.

** A maximum of 8 process termination blocks and socket covers can be ordered. See IBM 3644 Component Description Manual, GA24-3653.

- Removal and packing of the 3645 at time of discontinuance.
- Using and following the problem determination procedures and and filling out the trouble report prior to calling for service.
- Relocation of the 3645 (if required) to allow IBM service.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operation to determine:

- Whether or not continued operation is possible
- Whether terminal, loop, controller, accessory, or media is at fault.

Proper Terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement applies to the 3645 Printer.

Maintenance of the printer will normally be performed at the installed location.

IBM 3645 PRINTER

Purpose: A receive-only printer for printed output in interactive 3630 Plant Communication System applications.

The 3645 is a 120 cps maximum bi-directional printer.

Note: Actual printer throughput is dependent on system and application characteristics.

Highlights:

The 3645 provides a hard-copy output on a variety of forms to meet plant floor printing requirements. The printer is a bi-directional matrix printer with electronic tabulation and indexing. Line spacing is 6 lines per inch. Up to 4 part cut forms can be used with standard friction feed. For continuous forms, the Forms Tractor (#8700) or the Forms Tractor with Separator Bar (#8701) is recommended. Card stock forms are not recommended.

Two printing feature options are provided:

Character Print - Standard (#1501) provides basic character size printing (approximately .072 inch wide by 0.117 inch high). The printer character dot matrix is four of seven wide by eight high, giving high legibility. The maximum print line is 132 positions. Character spacing is ten to the inch.

Character Print - Large (#1502) provides four character size printing options under program control.

Basic character size (approximately 0.072 inch wide by 0.117 inch high), and approximately two times standard, four times basic size, and eight times standard size.

Intermix of printing sizes on a single line is not permitted.

The 3645 has been designed to operate in most industrial and commercial environments. It attaches to a 3631 or 3632 Plant Communication Controller via a local 9600 bps loop. The 3645 also attaches to a 3842 Loop Control Unit via a 2400 bps loop, or 8100 System Loop.

Two variable width forms tractors are available ... see "Special Features."

Supplies: A black ribbon, Part No. 1136653 or equivalent, is required.

Prerequisites:

- A Loop Station Connector installed on a 3631/3632 or 3842 or 8100 System Loop.
- Either Character Print - Standard (#1501) or Character Print - Large (#1502) must be specified ... see "Special Features."

When ordering this machine for use with an 8100 System, the "Terminal Requirements" on the appropriate 8130, 8140 or 8101 machine page should be reviewed.

Forms Specification: Refer to *Form Design Reference Guide for Printers, GA24-3588* ... use 3767 specifications.

Bibliography: IBM 3630 Plant communication System - System Description, GA24-3652.

Customer Setup: the 3645 is designated customer setup (CSU), thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities The customer is responsible for:

- Unpacking, placement, setup, and checkout of the 3645 at time of delivery, or when relocating the 3645.

There is no regularly scheduled IBM preventive maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMMC in "Prices."

Maintenance courses are offered to the customer for a separate charge.

Physical Environments: The 3645 may be used in industrialized work zones of a wide range of business, industrial, and commercial establishments.

It can resist:

- Concentration of certain common, corrosive gases.
- Accumulations of dust, grit, and dirt.
- Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
- Most industrial types of electromagnetic interference associated with terminal operation sites.
- Vibration and shock associated with shipping, placement, operation, and relocation of the terminal for most types of industries.

For environmental requirements refer to *IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675*.

SPECIFY

- **Voltage** (120 V AC, 1-phase, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug. **Note:** 120 VAC is compatible with existing 115 V AC systems. **Field Installation:** Not recommended.
- **Power Cable:** #9986 for 1.8 meter (6 foot) cable, or #9987 for 4.3 meter (14 foot) cable.
- **Loop Cable:** #9976 for 1.6 meter (6 foot) cable, or #9977 for 4.3 meter (14 foot) cable.
- **Color:** #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

	Mdl	MLC 5 Yr	Purchase††	MMMC
3645	1	\$191	\$4,700	\$44

Machine Group: D Per Call: 1 Purchase Option: 55%
Useful Life Category: 2 Warranty: B Upper Limit Percent: 5%
Termination Chg Months: 6 Termination Chg Percent: 20%

SPECIAL FEATURES

CHARACTER PRINT - STANDARD (#1501). Provides dot matrix character size approximately 0.072 inch wide by 0.117 inch high at 10 characters per inch. **Limitation:** Cannot be installed with Character Print-Large Feature (#1502). **Maximum:** One. **Field Installation:** Yes.

CHARACTER PRINT - LARGE (#1502). Provides four character size printing options under program control. Standard - approximately 0.072 inch wide by 0.117 inch high at 10 characters per inch, and approximately two times standard size, four times standard size, and eight times standard size. Intermix of printing sizes on a single line is not permitted. **Limitation:** Cannot be installed with Character Print - Standard (#1501). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Variable Width Forms Tractor (#8700) or Variable Width Forms Tractor with Separator (#8701).

VARIABLE WIDTH FORMS TRACTOR (#8700). A forms feeding

†† Pilot Test Plan applies.

3645 Printer (cont'd)

device for continuous edge-punched fan-fold forms. Up to 6 parts (total thickness - 46mm (0.018 inch) may be used. Five and six part continuous forms should be tried on an individual basis for acceptable feeding, registration, and print quality. Overall forms width from 76mm to 381mm (3 to 15 inches can be fed. End of forms detection is provided. **Maximum:** One. **Field Installation:** Yes. **Note:** If this feature is ordered color must be specified: #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

VARIABLE WIDTH FORMS TRACTOR WITH SEPARATOR (#8701). Forms feeding device for continuous edge punched fan-fold forms. A separator bar permits tearing off continuous forms at the perforation to within 40mm (1.5 inches) of the top printing line without misalignment of subsequent forms. Forms should have perforated carrier strips on both sides. Up to 4 part continuous forms to a total thickness 0.3mm (0.012 inch) may be used. Forms without perforated carrier strips and/or greater than 4 parts are not recommended. Form widths from 127mm to 378mm (5 to 14-7/8 inches) can be used. End of forms detection is provided. **Maximum:** One. **Field Installation:** Yes. **Note:** If this feature is ordered color must be specified: #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

Special Feature Prices:	MLC			
	5 Yr	Purchase	MMMC	
Character Print-Standard #1501	\$15	\$400	\$3	
Character Print-Large 1502	30	900	4	
Variable Wdh Forms Trctr 8700	5	160	1	
Variable Wdh Forms Trctr with Separator Bar 8701	6	170	1	

IBM 3646 SCANNER CONTROL UNIT

Purpose: The 3646 allows attachment of Magnetic Hand Scanners or Magnetic Slot Readers for rapid, accurate data collection.

The standard 3646 can attach up to two magnetic readers, Magnetic Hand Scanners or Magnetic Slot Readers. Two additional magnetic readers can be attached via the optional Magnetic Reader Attachment (#6351). Each magnetic reader can be addressed for independent operation.

Highlights: The 3646 is a compact terminal designed to bring magnetic scanning capability to the work station. Its capabilities include:

- Free standing on a table, work bench, etc.
- Wall or column mounted via accessory brackets.
- Up to 4 magnetic readers.
- Readers can be Magnetic Hand Scanners or Magnetic Slot Readers in any combination.

Supplies: Magnetic Stripe Badges ... these supplies, if required, may be ordered through IBM

Prerequisites: A Loop Station Connector on a 3631/3632, 3842 or 8100 loop ... a Magnetic Hand Scanner or Magnetic Slot Reader ... see #6351 under "Special Features."

When ordering this machine for attachment to an 8100 system, "Terminal Requirements" on the appropriate 8130, 8140 or 8101 pages in the "Machines" section should be reviewed.

Bibliography: IBM 3630 Plant Communication System - System Description, GA24-3652 ... IBM 3646 Scanner Control Unit Operating Guide, GA24-3683.

Customer Setup The 3646 is designated customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

Unpacking, placement, set-up, and checkout of the 3646 at time of delivery or when relocating the 3646. A Magnetic Hand Scanner or Magnetic Slot Reader is required for checkout.

Removing and packing of the 3646 at time of discontinuance.

Using and following the problem determination procedures and filling out the trouble report prior to calling for service.

Relocation of the 3646 (if required) to allow IBM service access.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operation to determine:

Whether or not continued operation is possible.

Whether terminal, loop, controller, accessory, or media is at fault.

Proper terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement as described in the General Information section of the sales manual applies to the 3646 terminals.

Maintenance of the 3646 terminals will normally be performed at the installed location.

For maintenance of 3646 accessories, refer to M 10000 pages.

There is no regularly scheduled IBM preventive maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMMC in "Prices" below.

Maintenance courses are offered to the customer for a separate charge.

Physical Environment: The 3646 and accessories may be used in the industrialized work zones of a wide range of business and commercial establishments.

They can resist:

Concentrations of certain common corrosive gases.

Accumulations of dust, grit and dirt.

Temperature and relative humidity extremes that are common to terminal operational sites for most industries.

Most industrial types of electromagnetic interference associated with terminal operational sites.

Vibration and shock associated with the shipping, operation and relocation of the terminal for most types of industries.

For environmental specifications, refer to the IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675.

SPECIFY: [1] Voltage (120 V AC, 1-phase, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug. **Note:** 120 V AC is compatible with existing 115 V AC systems. **Field Installation:** Not recommended.

[2] Power Cable: #9986 for 1.83 meter (6 foot) cable, or 9987 for 4.27 meter (4 foot) cable.

[3] Loop Connection Cable: #9976 for 1.83 meter (6 foot) cable, or #9977 for 4.27 meter (14 foot) cable.

[4] Color: #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

PRICES:	MLC		
	5 Yr	Purchase††	MMMC
3646	1	\$78	\$2,555 \$11

Machine Group: A Per Call: 1 Purchase Option: 55%
Useful Life Category: 2 Warranty: B Upper Limit Percent: 5%
Termination Chg Mnths: 6 Termination Chg Percent: 20%

SPECIAL FEATURES

MAGNETIC READER ATTACHMENT (#6351). For attachment of two additional Magnetic Hand Scanners, Magnetic Slot Readers, or Dual Entry Magnetic Slot Readers. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MLC		
	5 Yr	Purch	MMMC
Magnetic Reader Attach #6351	\$19	\$630	\$2.50

Accessories: The following items are available on a purchase only basis. For shipment with the machine order the Feature Number and quantity as shown below at the price listed in the M 10000 pages. See M 10000 pages for additional information and for ordering

Item	Feature Number	Maximum Qty
Magnetic Hand Scanner	#9440	*
Magnetic Slot Reader	9441	*
Dual Entry Mag Slot Reader	9442	*
Mounting Bracket	9450	1
Magnetic Reader Extension Cable ... for use with Magnetic Hand Scanner or Magnetic Slot Reader		
6 meter	9106	**
12 meter	9107	**

* A maximum of 4 magnetic readers or scanners may be ordered.

** A maximum of 4 extension cables may be ordered.

†† Pilot Test Plan applies.



IBM 3647 TIME AND ATTENDANCE TERMINAL

Purpose: A data entry terminal designed for attendance and other data entry labor reporting applications.

Highlights

The 3647 is designed for attendance, labor reporting and other data entry applications. The basic 3647 has a magnetic scanner adapter and a four digit display which can be used for time of day. Two optional features are available:

- Function Switch ... a six-position rotary switch that is customer definable.
- Control Feature ... provides control signals to allow door openings, audible alarms, etc.

An optional magnetic slot reader mounting bracket accessory provides attachment for a slot reader. This mounting bracket is firmly attached to the 3647 via a keylock. The slot reader cable is coiled within the bracket. See "Accessories" below.

The 3647 can be table or wall mounted. An optional wall mounting bracket accessory is available. See "Accessories" below.

The 3647 provides:

- Time of Day Clock -- the initial time is set under program control and can be set for a 12 or 24 hour clock with time displayed in hours and minutes, or hours and hundredths of hours.
- Input Buffer -- an input buffer mode of operation can be selected to store multiple input messages. This provides a high walk-by rate and allows input when the controller, loop, or data link is inoperative. A no-buffer mode of operation can also be selected to permit interactive processing on each input message.
- Invalid Document Code -- an invalid document code option can be selected which allows input messages to be checked for the presence of a non-numeric character. Input without this character is rejected by the 3647.
- Time Stamping -- a time stamping option can be selected which sends the displayed time of day with each input message transmitted to the controller.

Prerequisites: A loop station connector installed on a 3631 or 3632 Plant Communication Controller or an 8100 Information System loop. For magnetic stripe reading a Magnetic Slot Reader, Dual Entry Magnetic Slot Reader, or a Magnetic Hand Scanner is required ... see "Accessories" below.

Customer Set-up: The 3647 is designated Customer Set-up (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibility: The customer is responsible for:

- Unpacking, placement, set-up and checkout of the 3647 at time of delivery or when relocating the 3647.
- Removing and packing of the 3647 at time of discontinuance.
- Using and following the problem determination procedures and filling out the trouble report prior to calling for service.
- Relocation of the 3647 (if required) to allow IBM service access.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operations to determine:

- Whether or not continued operation is possible.
- Whether terminal, loop, controller, accessory, or media is at fault.

Proper terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement applies to the 3647, however there is no regularly scheduled IBM preventive maintenance.

Maintenance of the 3647 will normally be performed at the installed location.

If purchased, the terminals are eligible for Maintenance Agreement service immediately following expiration of the warranty period.

Maintenance courses are offered to the customer for a separate charge.

Physical Environments

The 3647 may be used in industrialized work areas of a wide range of business, industrial and commercial establishments.

It can resist:

- Concentrations of certain common, corrosive gases.
- Accumulations of dust, grit and dirt.
- Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
- Most industrial types of electromagnetic interference associated with terminal operational sites.
- Vibration and shock associated with shipping, placement, operation and relocation of the terminal for most types of industries.

For environmental specifications, refer to the *IBM 3630 Installation Manual-Physical Planning, GA24-3675.*

Bibliography: IBM 3630 Plant Communication System-System Description, GA24-3652 ... IBM 3647 Time and Attendance Terminal - Operating Guide (SRL No. available March, 1980) ... Introduction to 8100 System, GA27-2875.

Supplies: Magnetic striped badges and documents. These supplies may be ordered through IBM

SPECIFY

- **Voltage** (120 V AC, 1-phase, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug. **Note:** 120 V AC is consistent with existing 115 V AC systems. **Field Installation:** Not recommended.
- **Power Cable:** #9986 for 1.8 meter (6 foot) cable, or #9987 for 4.3 meter (14 foot) cable.
- **Loop Cable:** #9976 for 1.8 meter (6 foot) cable, or #9977 for 4.3 meter (14 foot) cable.
- **Color:** #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

	Mdl	MLC 5 yr	Purchase††	MMMC/ AMMCR
3647	1	\$84	\$2,725	\$12.50

Plan Offering: Plan D Maintenance: A Per Call: 1
Purchase Option: 55% Warranty: B Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 20%
Upper Limit Percent: 5% Initial Period Maint. Svc: 3 mos.

SPECIAL FEATURES

CONTROL FEATURE (#1501). Provides one point of TTL compatible input, one point of TTL compatible output, and two TTL compatible control signals. **Maximum:** One. **Field Installation:** Available at time of manufacture only.

FUNCTION SWITCH (#3950). Provides a 6 position rotary switch which can be set by the operator. Five switch settings each transmit a unique function code when a magnetic stripe is scanned. One switch setting is set to "null". The meaning of the switch position is left to the customer and space is provided for a customer printed definition label near the switch. **Maximum:** One. **Field Installation:** Available at time of manufacture only.

	MLC 5 YR	Purchase	MMMC/ AMMCR
Control Feature	#1501	\$4	\$100
Function Switch	3950	6	225 .50

ACCESSORIES: The following items are available on a purchase only basis. For shipment with the machine order the Feature Number below and the quantity required at the prices listed in the M 10000 pages. See M10000 pages for additional information and for field installation.

Item	Feature No.	Maximum Qty
Magnetic Hand Scanner	9440	*
Magnetic Slot Reader	#9441	*
Dual Entry Mag Slot Reader	9442	*
Mag Slot Rdr Mtg Bracket	9445	1
Wall Mounting Bracket	9450	1
Magnetic Extension Cable		
6 Meter	9106	**
12 Meter	9107	**

* A maximum of 1 magnetic slot reader or scanner may be ordered. ** A maximum of 1 extension cable may be ordered.

†† Pilot Test Plan applies. PTP Purchase Option Percent, 70%



IBM 3651 STORE CONTROLLER MODELS - PROGRAMMABLE STORE SYSTEM

Purpose: The control units for a 3650 Programmable Store System; through standard retail functions tailored by the customer to the customer's own requirements, and/or customer supplied supermarket application programming, the 3651 controls the operation of the 3650 Programmable Store System and its related terminals and provides for communications with an appropriate S/370 virtual storage processor.

Model A25 5 megabyte integral disk storage. Limited features and processing capability.* Supported by Programmable Store System Host Support only. Attaches 3275 mdl 3, 3653 mdl 1 and 1P, and 3663 mdl 1P, 2 and 3P terminals.

Model B25 Same as model A25 except has 9.2 megabyte integral disk storage.

Model A75 5 megabyte integral disk storage. Many features, full processing capability.* Supported by Programmable Store System Host Support only. Attaches 3275 mdl 3, 3653 mdl 1 and 1P, 3657 mdl 1, 3784 mdl 1, and 3663 mdl 1P, 2 and 3P terminals.

Model B75 Same as model A75 except has 9.3 megabyte integral disk storage.

Model C75 Same as model A75 except has 18.6 megabyte integral disk storage. The model C75 is physically larger than the model A75 or B75.

Model D75 Same as model A75 except has 27.9 megabyte integral disk storage. The model D75 is the same physical size as the model C75.

* NOTE: The 3651 mdl A25 and B25 Store Controllers provide a lower entry system for those users who do not require the capacity and internal processing capability of the 3651 mdl A75, B75, C75, and D75. The effect of the different internal processing capability upon overall system performance is dependent upon the total system configuration and workload.

Highlights: The 3651 is a modular, programmable unit that provides the link between its attached terminals and the host data processing center. The 3651 is normally used to collect data from the various parts of the system, perform edit, logic, and arithmetic operations on that data and then log and/or forward it to its ultimate destination within the overall system - terminal or data processing center. The 3651 mdl 75 can also communicate with another model 75. Application functions for retail operations via 3653 mdl 1 or 3653 mdl 1P terminals functioning as 3653 mdl 1 terminals are provided as standard. All other applications are performed by customer supplied application programming. In models A25, B25, A75, B75, C75 and D75, customer supplied supermarket and/or retail application programs may be used along with or instead of the standard retail operations.

Standard features include the following:

Loop Adapter:

- Model 25 - Provides for attachment of one in-store local loop.
- Model 75 - Provides for attachment of one in-store local loop and one additional loop which may be specified as local or remote (see Figure 1).

Controller Storage: The basic 3651 contains storage optionally expandable via special features (see Special Features below). System configuration as well as user programs determine if additional storage increments are required.

	Basic Storage	Maximum Storage
Model 25	61,440 bytes	77,824 bytes
Model 75	61,440 bytes	126,976 bytes

Integral Disk Storage -- the Integral Disk Storage is used for storage of selected controller functions, user written application programs, system configuration data, data logging and data sets (files).

	Model A25 (5MB)	Model B25 (9.2MB)	Model C75 (18.6MB)	Model D75 (27.9MB)
Bytes per Track	15,360	15,360	15,360	15,360
Tracks per Cylinder	2	2	2	2
Bytes per Cylinder	30,720	30,720	30,720	30,720
Cylinders per IDS	167	301	602	903
Storage Capacity:				
Moveable Head	5,130,240	9,246,720	18,493,440	27,740,160
Fixed Head (Mdl 75 only)	122,880	122,880	245,760	368,640

Host Communications Adapter -- provides for transmission to and from a properly equipped S/370. The basic transmission rate is 2400 bps over switched or non-switched networks with 4800 bps as a specify option. This adapter interfaces to appropriate IBM modems. With the appropriate features available on model 75 only the Host Communications Adapter can communicate with another 3650 Programmable Store System or locally attach a 3704 or 3705 ... see "Communications Facilities" below and M 2700 pages.

To communicate with another 3650 system or local attachment to 3704 or 3705, see Special Features below.

Audible Alarm -- activated when predetermined events require operator attention or intervention for system operation. A contact closure to which the customer can attach his remote alarm is available as an option with 3669 Attachment (see 3669 Attachment in Special Features below).

Controller Storage Save (Model 75 only) -- critical areas of controller storage are automatically written on the integral disk unit when power is turned off or a power failure is detected.

Terminal Devices: The terminals which are identified above under the different models of the 3651 are attached to the 3651 via Local/Remote Loop Adapter. A maximum of 191 terminals can be addressed by the 3651. However, the number of terminals which can be supported depends upon traffic volumes, desired response times, applications to be performed, and the model of the 3651.

One 3784 Line Printer mdl 1 can be attached to the 3651 model 75 control unit.

Communications Facilities: The Host Communications Adapter (mdl 25 and 75), Auxiliary Communications Adapter (#6185 - mdl 75 only) and 3669 Attachment (#8069 - mdl 75 only) permit operation at the speeds indicated, over the facilities shown below, when using the appropriate modem. For information concerning the facilities, see M 2700 pages. The alphameric communications facility references below correspond to those shown on the charts on those pages.

- At 2400 bps ... on facility C5, C5M, D4, D4M, D4SB or X1M
- At 4800 bps ... on facility C6, C6M, D5, D5M, D5SB or X2M

NOTE: Neither the auxiliary communications adapter or the 3669 attachment can operate at 4800 bps.

PREREQUISITES: At the host location, a virtual storage S/370 Processor with properly equipped 3704 or 3705 (or ICA for BSC communications) ... see M 2700, 3704, 3705 pages.

SPECIFY: [1] Voltage (AC, 1-phase, 60 Hz): Locking plug -- #9884 for 208 V or #9886 for 230 V. Non-lock plug -- #9885 for 208 V or #9887 for 230 V.

[2] Modem Attachment Host Communications Adapter: One IBM modem can be attached to this adapter on the 3651. The 3651 provides a cable and interface for connection of IBM modems at transmission rates of 2400 bps or 4800 bps for communications with the S/370. If switched network is selected, auto answer capability is standard. If leased operation is selected, dial back-up is provided on a manual dial basis using the IBM 3872 or 3874 Modem with appropriate special features. 4-wire Switched Network Backup is available with the 3863 mdl 1 and 3864 mdl 1.

Specify Code	Speed (bps)	IBM Modem
#9120	2400	3872 3863
#9121	2400 (2)	3872 3863
#9122	2400 (3)	3872 3863
#9124	4800 (2)	3874 3864
#9125	4800 (3)	3874 3864
#9126	4800	3874 3864

NOTES:

- For communications capabilities, product description and special features, see 3863, 3864, 3872, 3874 and M 2700 pages.
- (2) Point-to-point network.
- (3) Multipoint network.

[3] System Attachment: identify the host processor(s) for the 3650 Retail Store System by specifying the following codes:

Processor	Code	Processor	Code
3115	#9589	3148	#9591
3125	9586	3155 II	9583
3135, 3135-3	9581	3158	9587
3138	9590	3165 II	9584
3145, 3145-3	9582	3168	9588
3033	9592		

[4] Controller Designation: Specify #9491 on the first 3651 mdl 25 or 75 to be used with a host system location requiring 3650 Programmable Store System Host Support. Specify #9492 on each additional 3651 mdl 25 or 75 in the network. Specification of #9491 will result in controller data (DTR) being sent to host

3651 Store Controller Models - Programmable Store System (cont'd)

location. When #9491 is specified, additional information must be specified as follows:

- 1) Specify one of the following to indicate magnetic tape density (media) used at the host system location. The tape media is available under DOS/VS, OS/VS1 and OS/VS2 only.

- #9412 - 9-track 800 bpi.
- #9413 - 9-track 1600 bpi.
- #9414 - 9-track 6250 bpi.

If magnetic tape is not used at the host system, specify one of the following media which are available under DOS/VS only.

- #9421 - 2316 Disk Pack.
- #9422 - 3336 Disk Pack Mdl 1
- #9423 - 3336 Disk Pack Mdl II
- #9424 - 3348 Data Module

The 3651 controller data will be sent via the specified media to the IBM Programming Systems Representative at the host system location for installation. If disk media is required, the IBM disk will be returned to the plant location after installation of the controller data.

- [5] Specify the following: #9504 - for 3650 BSC or SDLC Programmable Store Systems host support under DOS/VS VTAM or BTAM, OS/VS1 VTAM or BTAM, and OS/VS2 VTAM or BTAM. NOTE: The corresponding release of 3650 PSS Host Support must be ordered See SCP pages of the sales manual.

- [6] Store Loop Polarity Tester: Order Store Loop Polarity Tester Part No. 1859559, for site of store loop wiring ... one is furnished at each site at no charge. NOTE: The customer must provide (purchase, install and maintain) all necessary 3650 communications lines within the store. (Bulk Loop Cable is available from IBM. See M10000 pages.)

- [7] Second Loop Adapter (Model 75 only): Specify #9442 to designate the second loop adapter as local or specify #9552 to designate the second loop adapter as remote. (See Figure 1 below.) NOTE: #9552 is not allowed with 3669 Attachment (#8069).

- [8] Maintenance Documentation: Specify #9450 for 3653 maintenance documentation and/or #9451 for 3663 maintenance documentation.

PRICES: Mdl	MAC/MRC	ETP/MLC 2 yr	Purchase	MMMC
3651 A25	\$ 746	\$ 635	\$19,000	\$205
B25	864	735	22,000	215
A75	872	742	26,500	225
B75	959	816	29,680	235
C75	1,469	1,250	47,960	335
D75	1,880	1,600	58,340	454

Plan Offering: Plan B Purchase Option: 55% Machine Group: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: The following model changes can be made in the field:

From	To	From	To
A25	B25*, A75*, B75*	A75	B75*
B25	B75*	A60	A75, B75*
A50	A75, B75*	B60	B75
B50	B75	C75	D75

On purchased model 50 to model 75 changes either Local Loop Adapter, Additional (#4882 with specify code #9442 or #9443) or Remote Loop Adapter (#6111 with specify code #9552 or #9553) is a prerequisite on the model 50.

* These model changes require the replacement of the integral disk storage. Adequate provision must be made for retaining data contained on the replaced disk storage at the host location so it can be transmitted to the new disk storage.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges) Note 2.

From Model A25 to Model B25	....	\$ 3,000**	
From Model A25 to Model A75	....	\$ 7,500**	
From Model A25 to Model B75	....	\$10,680**	
From Model B25 to Model B75	....	\$ 7,680**	
From Model A50 to Model A75	....	\$ 2,585**	Note 1
From Model A50 to Model B75	....	\$ 6,285**	Note 1
From Model B50 to Model B75	....	\$ 2,585**	
From Model A75 to Model B75	....	\$ 3,180**	
From Model A60 to Model A75	....	\$ 4,100**	
From Model A60 to Model B75	....	\$ 7,800**	Note 1
From Model B60 to Model B75	....	\$ 4,100**	
From Model C75 to Model D75	....	\$10,380**	

** Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model change involves the removal of parts which become the property of IBM."

Note 1 Customers who elect to purchase the 3651 mdl A50 or B50 with Storage Increment Type I (#1550) and/or second Additional Loop (#4882, #4890 or #6111) or the 3651 mdl A60 or B60 with Storage Increment (#7680) should consider the model A75 or B75 initially as field conversions to the model A75 or B75 require the replacement of these features.

SPECIAL FEATURES

CONTROL STORAGE FEATURES -- the amount of be ordered is dependent upon the number and type of terminals attached to the system as well as system configuration and user programs.

For available

storage configurations, see Table A below.

STORAGE INCREMENT - TYPE II (#1564). [Mdl A75, B75, C75, D75 only] Each #1564 provides the 3651 with an additional 16,384 positions of storage. **Maximum:** Three (see Table A). **Field Installation:** Yes. **Prerequisites:** The 3651 must be equipped with Storage Expansion Feature (#1570) and First Storage Increment (#1571).

STORAGE EXPANSION FEATURE (#1570). Provides the capability of expanding storage beyond 61,440 bytes. **Maximum:** One. **Field Installation:** Yes. **Note:** First Storage Increment (#1571), or First Storage Increment (#1571) and Storage Increment - Type II (#1564) are required to provide the appropriate additional positions of storage (see Table A).

FIRST STORAGE INCREMENT (#1571). Provides the 3651 with the first 16,384 additional positions of storage. See Table A. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Storage Expansion Feature (#1570).

TABLE A

Storage Configuration	Feature Distribution
Total Storage	First Storage Increment (#1570) / Storage Increment Type II (#1564)
(A) 61,440	0 / 0
(B) 77,824	1 / 0
(C) 94,208	1 / 1
(D) 110,592	1 / 2
(E) 126,976	1 / 3

IML-WRITE ADAPTER (#4633). Provides the 3651 with the ability to write an IML (Initial Machine Load) tape on a user provided tape cassette recorder to be read by a Point of Sale terminal equipped with the IML-Read Adapter (#4632) feature. **Maximum:** One. **Field Installation:** Yes.

LOCAL LOOP ADAPTER, ADDITIONAL (#4882). [Mdl A75, B75, C75, D75 only] Provides an additional Local Loop Adapter as the third loop on the 3651. The actual number of terminals that can be attached will depend upon the program capacity and time requirements of the 3651 to service the loops as well as the communications link to the S/370 ... see "Terminal Devices" above. **Specify:** See Figure 1. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Not available on the 3651 if 9600 bps Loop Adapter (#4890) or Remote Loop Adapter (#6111) is installed.

9600 BPS LOOP ADAPTER (#4890). [Mdl A75, B75, C75, D75 only] Provides a 9600 bps Local Loop Adapter as the third loop. The feature provides for the attachment of 3275 Display Station



3651 Store Controller Models - Programmable Store System (cont'd)

mdl 3s with 9600 bps Transmission Speed (#7825) feature installed. The actual number of 3275 Display Station mdl 3s installed will depend upon program capacity and time requirements of the 3651 to service the loops and the communications link to the S/370 ... see "Terminal Devices" above. **Limitations:** Not available if Local Loop Adapter, Add'l (#4882) or Remote Loop Adapter (#6111) is installed. Only 3275 Display Station mdl 3s with 9600 bps Transmission Speed (#7825) can be attached to this Loop Adapter. **Specify:** See Figure 1. **Maximum:** One. **Field Installation:** Yes.

REMOTE LOOP ADAPTER (#6111). [Mdl A75, B75, C75, D75 only] Provides a Remote Loop Adapter as the third loop on the 3651 for online service for up to twelve remote sites per Remote Loop Adapter. The feature provides an interface to an IBM 3872 Modem on site which via leased line connects to a 3659 Remote Communications Unit at each remote site. This allows for the extension of the loop to up to (1) three remote locations, with a 3659 mdl 1 at each site, (2) twelve remote locations, with a 3659 mdl 2 (multipoint) at each site, (see "Terminal Devices" above). The 3651 treats the remote loop as if it were a local loop. **Limitations:** Not available if Local Loop Adapter, Add'l (#4882) or 9600 BPS Loop Adapter (#4890) is installed. **Specify:** See Figure 1. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** One IBM 3872 Modem with Point-to-point (#6101 or #6102) feature per Remote Loop Adapter at 3651 site and a 3659 Remote Communications Unit at each remote site. When more than one remote site is attached using 3659 mdl 1, a half-duplex 2-wire terminated, non-switched voice grade line is required between the 3651 and the first remote site between successive remote sites, and from the last remote site back to the 4-wire terminated, non-switched voice grade line is required. When using the 3659 mdl 2 for more than one remote site, 4-wire duplex multipoint service is required. The 3659 mdl 2 requires that the 3872 be a basic control station (no special features) or equipped with Second Modem (#6302).

AUXILIARY COMMUNICATIONS ADAPTER (#6185). [Mdl A75, B75, C75, D75 only] Provides a separate 2400 bps communications interface which can operate independently of the Host Communications Adapter. It can be used for either one of the following but not both:

- a. 3651-75 to 3651-75 communications.
- b. Communications with another 3650 system via a 3669 Store Communications Unit.

Maximum: One. **Field Installation:** Yes. **Limitations:** Only one Auxiliary Communications Adapter (#6185 or #6188) allowed per 3651-75, not allowed with 3669 Attachment (#8069) with Specify #9200 for Host Communications Adapter.

Prerequisites:

- a. For 3651-75 to 3651 communications
 - 1. A 3872.
 - 2. Another 3651-75 similarly equipped.
- b. For backup with another 3650 system
 - 1. 3669 Attachment (#8069) with specify #9210.
 - 2. A 3669 Store Communications Unit.

AUXILIARY COMMUNICATIONS ADAPTER SYNCHRONOUS CLOCK (#6188). [Mdl A75, B75, C75, D75 only] Provides a 2400 bps communications interface which operates independently from the Host Communications Adapter to allow direct communications with another 3651-75 with the same feature without the use of modems. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Only one Auxiliary Communications Adapter (#6185 or #6188) allowed per 3651-75, not allowed with 3669 Attachment (#8069). **Prerequisite:** Another 3651-75 with #6188.

SYNCHRONOUS CLOCK - HOST (#7708). [Mdl A75, B75, C75, D75 only] Provides clocking from the Host Communications Adapter allowing the direct attachment to a local 3704 or 3705 at 2400 bps. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** The 3704 or 3705 must be equipped with Line Set, Type 1F (#4716). **Note:** A 6 meter (20 foot) external cable is provided which connects to the 3704/3705 cable.

3669 ATTACHMENT (#8069). [Mdl A75, B75, C75, D75 only] Provides the capability to attach one 3669 Store Communications Unit, which allows communications over switched networks at 2400 bps with another 3650 system, and alternately with a S/370 host processor. This feature can be provided for use with either the Host Communications Adapter or the Auxiliary Communications Adapter (#6185), but not with both. **Limitation:** When used with Auxiliary Communications Adapter (#6185), it cannot communicate with a host processor. **Specify:** (1) #9200 for use with Host Communications Adapter, #9210 for use with Auxiliary Communications Adapter (#6185) ... (2) #9220 if local audible alarm is desired, #9230 if contact closure is desired when operator attention is required. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** (1) Local Loop Adapter, specify #9442 ... (2) a 3669 Store Communications Unit.

3784 ADAPTER (#8154). [Mdl A75, B75, C75, D75 only] Provides the capability to directly attach one 3784 Line Printer mdl 1 to the 3651 controller. The 3784 mdl 1 must be located within 15

feet of the controller. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Specify feature #9716 must be specified on the 3784 mdl 1 for attachment of the 3784 to the 3651 mdl A75 and B75 and #9717 for attachment to the 3651 mdl C75 or D75.

Special Feature Prices:	MAC/ MRC	ETP/ MLC		Purchase	MMMC
		2 yr			
Stor Increment Type II	#1564	\$ 58	\$ 49	\$1,170	\$10.00
Stor Expansion Feature	1570	39	33	1,100	5.50
1st Storage Increment	1571	58	49	1,170	10.00
IML-Write Adapter	4633	12	10	450	1.50
Local Loop Adptr, Add'l	4882	43	37	1,515	2.00
9600 bps Loop Adapter	4890	87	74	3,020	4.00
Remote Loop Adapter	6111	43	37	1,515	2.00
Aux. Comm. Adapter	6185	43	37	1,515	2.00
Aux. Comm. Adapter -					
Synchronous Clock	6188	43	37	1,515	2.00
Synch Clock-Host	7708	15	13	572	.50
3669 Attachment	8069	7	6	250	1.50
3784 Adapter	8154	88	75	3,075	5.00

FIGURE 1

Loop Adapter Position*	Loop Adapter	Special Feature	Specify
2	Add'l Local		#9442
	Remote		#9552
3	Add'l Local	#4882	
	Remote	#6111	
	9600 bps	#4890	

* Loop Adapter position 1 is occupied by the standard Local Loop Adapter. Loop Adapter position 2 is standard and must be specified as Local (#9442) or Remote (#9552). If Loop Adapter position 2 is specified as remote, see Remote Loop Adapter (#6111) for prerequisites which will apply. For Loop Adapter position 3, either an Add'l Local (#4882) or Remote (#6111) or 9600 bps (#4890) Loop Adapter may be ordered.

IBM 3651 STORE CONTROLLER MODELS A50 and B50

Purpose: Through its standard functions, tailored by the customer to the customer's own requirements, the 3651 controls the operation of the 3650 Retail Store System and its related terminals and provides for communications with an appropriate S/370 or 4300 virtual storage processor.

Model A50 5 megabyte integral disk storage

Model B50 9.3 megabyte integral disk storage

Highlights: The 3651 is a modular, programmable unit that provides the link between point-of-sale (3653), receiving-marking (3275 mdl 3 and 3657), management (via 3275 mdl 3), and the host data processing center. The 3651 collects data from the various parts of the retail system, performs edit, logic, and arithmetic operations on that data and then logs and/or forwards it to its ultimate destination within the overall system-terminal or data processing center. The 3651 also communicates with its attached terminals on an interactive basis and processes inquiries against its files.

Standard features include the following:

Local Loop Adapter -- provides for the attachment of one in-store loop.

Controller Storage -- the basic 3651 contains storage optionally expandable via special features to 106,496 bytes (see Special Features below). System configuration as well as user programs determine if additional storage increments are required. Operation with many user programs will require the additional storage increments.

Integral Disk Storage -- the Integral Disk Storage is used for storage of selected controller functions, user written application programs, system configuration data, data logging and data sets (files).

	Model A50 (5 MB)	Model B50 (9.3 MB)
Bytes per Track	15,360	15,360
Tracks per Cylinder	2	2
Bytes per Cylinder	30,720	30,720
Cylinders per IDS	167	301
Storage Capacity		
Moveable Head	5,130,240	9,246,720
Fixed Head	122,880	122,880

Host Communications Adapter -- provides for transmission to and from a properly equipped S/370 or 4300 Processor. The basic transmission rate is 2400 bps over non-switched or switched networks with 4800 bps as a specify option. This adapter interfaces to appropriate IBM modems ... see "Communications Facilities" below and M 2700 pages.

For local attachment to 3704, 3705 or Communications Adapter on 4331 Processor, see Special Features below.

Audible Alarm -- activated when predetermined events require operator attention or intervention for system operation.

Controller Storage Save -- critical areas of controller storage are automatically written on two areas of the integral disk unit when power is turned off or a power failure is detected.

Terminal Devices: The following terminals are attached to the 3651 Store Controller via Local/Remote Loop Adapter -- 3653 Point of Sale Terminal, 3275 mdl 3 Display Station, and the 3657 Ticket Unit. Local Loop adapter number one can address 63 terminals and the other two Loop adapters (local or remote) can each address 64 terminals. However, the number of terminals which can be supported on each loop depends upon traffic volumes, desired response times, and applications to be performed.

One 3784 Line Printer mdl 1 may be attached to the 3651 controller unit.

Communications Facilities: The communications adapter permits operation at the speeds indicated, over the facilities shown below, when using the appropriate modem. For information concerning the facilities, see M 2700 pages. The alphanumeric communications facility references below correspond to those shown on the charts on those pages.

At 2400 bps ... on facility C5, C5M, D4, D4M, D4SB or X1M

At 4800 bps ... on facility C6, C6M, D5, D5M or X2M

PREREQUISITES: A 3704 or 3705 in 2701, 2703 Emulation Mode for BSC systems and in NCP/VS mode for SDLC systems (with appropriate features ... see M 3704 and 3705 pages) attached to any virtual storage S/370 or 4300 Processor. Also attaches via a Communications Adapter feature on the 4331 Processor ... see M 4331 pages for details.

SPECIFY: [1] Voltage (AC, 1-phase, 60 Hz): Locking plug -- #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9885 for 208 V, or #9887 for 230 V.

[2] **Modem Attachment Host Communications Adapter:** One IBM modem can be attached to this adapter on the 3651. The 3651 provides a cable and interface for connection of IBM modems at transmission rates of 2400 or 4800 bps for communications with the S/370 or 4300 Processor. If switched network is selected, auto-answer capability is standard. If leased point-to-point operation is selected, dial back-up is provided on a manual dial basis using the IBM 3863, 3864 or 3872 Modem with appropriate special features.

Specify Code	Speed (bps)	IBM Modem
#9120	2400	3872 3863
#9121	2400 (2)	3872 3863
#9122	2400 (3)	3872 3863
#9124	4800 (2)	3874 3864
#9125	4800 (3)	3874 3864
#9126	4800	3874 3864

Notes: (1) For communications capabilities, product description and special features, see 3863, 3864, 3872, 3874 and M 2700 pages.

(2) Point-to-point network.

(3) Multipoint network.

[3] **System Attachment:** identify the host processor(s) for the 3650 Retail Store System by specifying the following codes:

Processor	Code	Processor	Code
3115	#9589	3148	#9591
3125	9586	3155 II	9583
3135, 3135-3	9581	3158	9587
3138	9590	3165 II	9584
3145, 3145-3	9582	3168	9588
3033	9592	4331	9606
		4341	9607

[4] **Controller Designation:** Specify #9491 on the first 3651 to be used with a host system location requiring BSC RSS/Host support and on the first 3651 requiring SNA RSS/Host support and specify #9492 on each additional 3651 in the network. **NOTE:** #9491 may be specified twice if both BSC and SNA RSS/Host support is required in the network.

When #9491 is specified, additional information must be specified as follows:

1) Specify one of the following to indicate magnetic tape density (media) used at the host system location. The tape media is available under DOS/VS, OS/VS1 and OS/VS2 only.

- #9412 -- 9-track 800 bpi
- #9413 -- 9-track 1600 bpi
- #9414 -- 9-track 6250 bpi

If magnetic tape is not used at the host system, specify one of the following media which are available under DOS/VS only.

- #9421 -- 2316 Disk Pack
- #9422 -- 3336 Disk Pack Mdl I
- #9423 -- 3336 Disk Pack Mdl II
- #9424 -- 3348 Data Module

The 3651 controller data will be sent via the specified media to the IBM Programming Systems Representative at the host system location for installation. If disk media is required, the IBM disk will be returned to the plant location after installation of the controller data.

[5] Specify one of the following:

#9501 -- for 3650 BSC Retail Store System requiring Release 1 RSS/HOST Support. **NOTE:** Shipments of 3650 Systems requiring Release 1 Host Support under DOS/VS BTAM and OS/VS1 BTAM terminate in December, 1975.

#9502 -- for 3650 SNA Retail Store System requiring Release 2 or 3 RSS/Host Support under DOS/VS VTAM, OS/VS1 VTAM and OS/VS2 VTAM. Controllers specified with #9502 have a maximum of 57,344 positions of storage. Shipments of 3651 controllers specified as #9502 will terminate in March, 1976 to new customers and in July, 1976 to existing customers.

#9503 -- for 3650 SNA Retail Store Systems requiring Re-

**3651 Store Controller Models A50 and B50 (cont'd)**

lease 3 RSS/Host Support under DOS/VS VTAM, OS/VS1 VTAM and OS/VS2 VTAM. All controllers shipped to new customers after March, 1976 will require RSS/Host Release 3 and should be specified with #9503. **NOTE:** #9503 is a prerequisite for feature codes #1559, #1560 and #1564.

Note: The corresponding release of 3650 RSS Host Support must be ordered from PID. See SCP pages of the sales manual.

[6] Store Loop Polarity Tester: Order Store Loop Polarity Tester, Part No. 1859559, for site of store loop wiring ... one is furnished at each site at no charge. **NOTE:** The customer must provide (purchase, install and maintain) all necessary 3650 communications lines within the store. (Bulk Loop Cable is available from IBM. See M 10000 pages.)

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3651	A50	\$ 872	\$ 742	\$29,500	\$225
	B50	959	816	32,680	235

Plan Offering: Plan B Purchase Option: 55% Machine Group: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: %

Model Changes: Model changes between the models A50 or B50 and the model A60 or B60 are not recommended for field installation. 3651 features cannot be interchanged between models A50 or B50 and model A60 or B60. Model changes between model A50 and B50 can be made in the field. This change requires the replacement of the integral disk storage. Adequate provision must be made for retaining the data contained on the replaced disk storage.

Model changes between the A50 or B50 and the A75 or B75 can be made in the field. See the 3651 model A75 and B75 machine pages. Customers who elect to purchase the 3651 mdl A50 or B50 and Storage Increment Type 1 (#1559) should consider the model A75 or B75 initially as field conversions to the model A75 or B75 require the replacement of this feature.

On purchased model 50 to model 75 changes either Local Loop Adapter, Additional (#4882 with specify code #9442 or #9443) or Remote Loop Adapter (#6111 with specify code #9552 or #9553) is a prerequisite on the model 50.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model A50 to Model B50 \$3,180*

* Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this model change involves the removal of parts which become the property of IBM."

SPECIAL FEATURES

Control Storage Features: The amount to be ordered is dependent upon the number and type of terminals attached to the system as well as system configuration and user programs.

For available

storage configurations, see Table A below.

STORAGE EXPANSION (#1560). Contains 16,384 positions of storage to provide the capability of expanding storage beyond 57,344 positions to a maximum of 106,496 positions. **Maximum:** One. **Field Installation:** Yes. (See Table A) **Prerequisite:** Specify Feature Code #9503.

STORAGE INCREMENT (#1561). Each #1561 provides the 3651 with an additional 8,192 positions of storage. **Maximum:** Two. **Field Installation:** Yes. **Limitation:** Cannot be installed with #1559, #1560, #1564 or #9503. (#1561 not available after July, 1976)

STORAGE INCREMENT - TYPE I (#1559). #1559 provides the 3651 with an additional 8,192 positions of storage. **Maximum:** One. **Field Installation:** Yes. (See Table A) **Prerequisite:** Specify Feature Code #9503.

STORAGE INCREMENT - TYPE II (#1564). Each #1564 provides the 3651 with an additional 16,384 positions of storage. **Maximum:** Three. **Field Installation:** Yes. (See Table A) **Prerequisite:** Specify Feature Code #9503.

TABLE A

	Storage Configuration		Feature Distribution	
	Total Storage	Storage Increment - Type I (8,192 Pos.)	Storage Increment - Type II (16,384 Pos.)	Storage Expansion (Including 16,384 Pos.)
(A)	40,960	0	0	0
(B)	49,152	1	0	0
(C)	57,344	0	1	0
(D)	65,536	1	0	1
(E)	73,728	0	1	1
(F)	81,920	1	1	1
(G)	90,112	0	2	1
(H)	98,304	1	2	1
(I)	106,496	0	3	1

Notes: 1. Field installation of Storage Increment - Type I is only recommended in changing from configurations A, E and G. Storage Increment - Type II is not used in configuration A, B and D.

Customers who elect to purchase Storage Increment Type I and later order additional storage should consider purchase of Storage Increment Type II initially because some field upgrades of storage may require replacement of initial feature and installation of new feature.

2. Field upgrade from A to B and B to C is allowed via Storage Increment (#1561) through July 30, 1976; However, purchase customers should be advised that Storage Increment (#1561) cannot be used in configurations above 57,344 positions.

IML-WRITE ADAPTER (#4633). Provides the 3651 with the ability to write an IML (Initial Machine Load) tape on a user provided tape cassette recorder (refer to IBM 3650 Retail Store System Introduction Manual, GA27-3075), to be read by a Point of Sale terminal equipped with the IML-Read Adapter (#4632) feature. **Maximum:** One. **Field Installation:** Yes.

LOCAL LOOP ADAPTER, ADDITIONAL (#4882). This feature provides a second or third Local Loop Adapter on the 3651. Up to a maximum of 64 terminals can be attached to each additional Loop. The actual number of terminals will depend upon the program capacity and time requirements of the 3651 to service the Loops as well as the communications link to the S/370 or 4300 Processor ... see "Terminal Devices" above. **Limitation:** Cannot exceed a total of three Loop adapters (local or remote) per 3651. **Specify:** See Figure 1. **Maximum:** Two. **Field Installation:** Yes.

9600 BPS LOOP ADAPTER (#4890). Provides a 9600 bps local Loop Adapter. Available in lieu of a second or third Local Loop Adapter. The feature provides for the attachment of 3275 mdl 3 Display Stations with 9600 bps Transmission Speed (#7825) feature installed. The actual number of 3275 Display Station mdl 3s installed will depend upon program capacity and time requirements of the 3651 to service the Loops and the communications link to the S/370 or 4300 Processor ... see "Terminal Devices" above. **Limitations:** Cannot exceed a total of three Loop adapters (local or remote) per 3651. Only 3275 Display Station mdl 3s with 9600 bps Transmission Speed (#7825) can be attached to this Loop adapter. **Specify:** See Figure 1. **Maximum:** One. **Field Installation:** Yes.

REMOTE LOOP ADAPTER (#6111). Provides online service for up to twelve remote sites per Remote Loop Adapter. Available in lieu of a second or third Local Loop Adapter. The feature provides an interface to an IBM 3872 Modem on site which via leased line connects to a 3659 Remote Communications Unit at each remote site. This allows for the extension of the Loop to up to (1) three remote locations, with a 3659 mdl 1 at each site, (2) twelve remote locations, with a 3659 mdl 2 (multipoint) at each site, with a total of 64 terminals per Loop (see "Terminal Devices" above). The 3651 treats the remote Loop as if it were a local Loop. **Limitation:** Cannot exceed a total of three Loop adapters (local or remote) per 3651. **Specify:** See Figure 1. **Maximum:** Two. **Field Installation:** Yes. **Prerequisites:** One IBM 3872 Modem with Point-to-Point (#6101 or #6102) feature per Remote Loop Adapter at 3651 site and a 3659 Remote Communications Unit at each remote site. When more than one remote site is attached using 3659 mdl 1, a half-duplex 2-wire terminated, non-switched voice grade line is required between the 3651 and the first remote site, between successive remote sites, and from the last remote site back to the 3651. When only one remote site is to be attached, a duplex, 4-wire terminated non-switched voice grade line is required. When using the 3659 mdl 2 for more than one remote site, 4-wire duplex multipoint service is required. The 3659 mdl 2 requires that the 3872 be a basic control station (no special features) or equipped with Second Modem (#6302).



3651 Store Controller Models A50 and B50 (cont'd)
SYNCHRONOUS CLOCK (#7708). Provides clocking from the Host Communications Adapter allowing for direct attachment to a local 3704, 3705 or Communications Adapter on 4331 Processor at 2400 bps. **Maximum:** One; **Field Installation:** Yes. **Prerequisite:** The 3704 or 3705 must be equipped with Line Set, Type 1F (#4716); 4331 must be equipped with Local Attachment Interface (#4801) and prerequisites. **Note:** A 20' (6 meters) external cable is provided which connects to the 3704, 3705 or 4331 cable.

3784 ADAPTER (#8154). Provides the capability to directly attach one 3784 Line Printer mdl 1 to the 3651 controller. The 3784 mdl 1 must be located within 15 feet of the controller. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Specify feature #9716 must be specified on the 3784 mdl 1 for attachment of the 3784 to the 3651. Minimum storage required on the 3651 is 48K. **Note:** For attachment of the 3784 line printer, the controller must have EC 349850 applied and operating under RSS/Host Support Release 3. New 3651 controllers must have #9503 specified.

Special Feature Prices:		ETP/ MAC/ MRC		Purchase	MMMC
			2 yr		
Storage Expansion	#1560	\$ 96	\$ 82	\$2,270	\$15.50
Storage Increment	1561	32	27	637	5.00
Storage Incrmnt-Type I	1559	32	27	637	5.00
Storage Incrmnt-Type II	1564	58	49	1,170	10.00
IML-Write Adapter	4633	12	10	450	1.50
Local Loop Adptr, Add'l	4882	43	37	1,515	2.00
9600 bps Loop Adapter	4890	87	74	3,020	4.00
Remote Loop Adapter	6111	43	37	1,515	2.00
Synchronous Clock	7708	15	13	572	.50
3784 Adapter	8154	88	75	3,075	5.00

Figure 1

Loop Adapter Position *	Loop Adapter	Special Feature	Specify
2	Add'l Local	#4882	#9442
	Remote	#6111	#9552
	9600 bps	#4890	#9662
3	Add'l Local	#4882	#9443
	Remote	#6111	#9553
	9600 bps	#4890	#9663

* Loop Adapter Position 1 is occupied by the standard Local Loop Adapter. For Loop Adapter Position 2 and 3, either an Add'l Local (#4882) or Remote (#6111) or 9600 bps (#4890) Loop Adapter may be ordered. For each one ordered, also specify the applicable #9XXX code from the chart above. The 9600 bps Loop Adapter (#4890) may be ordered only once.

IBM 3651 STORE CONTROLLER - SUPERMARKET

Purpose: The control unit for a 3660 Supermarket System. Controls all functions of the 3663 Supermarket Terminals. A 3669 adapter is included, which allows communications at 2400 bps over appropriate communications facilities with a properly equipped S/370 or 4300 Processor. For backup purposes, the control unit, through the 3669 Store Communications Unit, can also communicate with and control 3663 Supermarket Terminals in one other preassigned location. See "Communications Facilities" and "Prerequisites."

Model A60 5 megabytes of integral disk storage

Model B60 9.3 megabytes of integral disk storage

Highlights: Up to twenty-four 3663 Supermarket Terminal stations can be attached to a 3651 mdl A60 or B60 in one store. Each 3663 mdl 1 or each 3663 mdl 2 counts as 1 out of the 24. In addition, for backup purposes, a 3651 mdl A60 or B60 can control all the 3663 Supermarket Terminals that are normally controlled by the other preassigned 3651 mdl A60 or B60 (normally at another location).

The 3651 mdl A60 or B60 (using the 3663 Supermarket Terminal) supports the following functions, in most combinations:

Customer Checkout

- Automatic pricing through code lookup in a master price file.
- Automatic handling of multiple priced items.
- Automatic handling of mix and match group pricing.
- Automatic distribution of net sales by department (up to 54).
- Automatic application of transaction discounts.
- Automatic computation of sales taxes with automatic handling of taxable and non-taxable items.
- Provision for tax exempt transactions.
- Automatic control of maximum value of food stamps that should be accepted.
- Check authorization facilities (positive or negative) through lookup against a check authorization record.
- Computation of change and trading stamps due.

All functions can be controlled to inhibit initiation by unauthorized personnel.

Store Support

- Preparation of the following account reports
 - store summary.
 - individual cashier performance and tender reconciliation.
 - store office tender reconciliation.
 - sales by department (up to 54).
 - distribution of miscellaneous income and distributions by account.
- Current inquiries for department sales, cashier performance and cash position, and store cash position.
- Inquiries and changes to master price records and operator authorization control records.
- Setting time and date for the internal clock.
- Customer checkout training mode.
- Printing miscellaneous messages received previously from the host S/370 or 4300 Processor.
- Entry of miscellaneous messages for subsequent retrieval by the host S/370 or 4300 Processor.
- Reporting of items returned by customers which are returned to stock.
- Updating the system with data received from the host S/370 or 4300 Processor.
- Shelf Label Preparation

The above functions are compatible with variable length reconciliation periods, e.g., daily or weekly, and they are compatible with 24 hour store operation. All functions are individually controlled to inhibit initiation by unauthorized personnel.

Data Accumulation

The 3651 mdl A60 or B60 accumulates the following by-product data for subsequent retrieval by the host S/370 or 4300 Processor: item movement totals, all accounting and performance totals used in store reports, totals of taxes and taxable sales, productivity totals for each terminal station in 15 minute increments, check authorization data requested, and individual logged entries covering coupons received, exception events, and security sensitive events.

Host S/370 or 4300 Processor Transmission

The 3651 mdl A60 or B60 can transmit to the host, upon receiving a request, all of the data shown under "Data Accumulation," and other data, or records in the 3651. The 3651 will clear out data or records upon request by the host. The 3651 can receive



3651 Store Controller - Supermarket (cont'd)

records, record changes, commands or other pertinent data from the host. See "Programming Support" section of sales manual for description of host, programming support and requirements.

Communications Facilities: For in-store operation, two store loops provide the communications linkage to the 3663 Supermarket Terminals. See Installation Manual - Physical Planning (GA27-3079) for the 3660 System and the 3660 Supermarket System "Systems" pages for further information.

The communications adapter permits operation at 2400 bps over communications common carrier facility type C5 for out-of-store communications. For information concerning that facility, see M 2700 pages.

PREREQUISITES:

- A 3669 Store Communications Unit mdl 1 must be attached.
- A 3663 Supermarket Terminal mdl 1 must be attached.
- Any virtual storage S/370 or 4300 Processor ... (3158 or 3168 VTAM only). For minimum configuration requirements, refer to Host S/370 or 4300 Processor System Programming pages. One of the following must be utilized - a 3704, 3705 or Communications Adapter on 4331 Processor equipped with appropriate features. For S/370 mdl 115, 125, 135, 135-3 or 138, this may be an ICA equipped with the proper BSC and switched network features. The modem that is used by the 3704, 3705 or Communications Adapter on 4331 Processor must be either a 3872 or equivalent or an IBM 2400 bps Integrated Modem with switched network features.

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug - #9884 for 208 V, or #9886 for 230 V. Non-lock plug - #9885 for 208 V, or #9887 for 230 V.

[2] Communications: #9071 for Binary Synchronous Communications, or #9072 for Synchronous Data Link Control Communications.

[3] Controller Designation: Specify #9491 on the first 3651 to be used with a host system location and specify #9492 on each additional 3651 in the network.

When #9491 is specified, additional information must be specified as follows:

- 1) Specify one of the following to indicate magnetic tape density (media) used at the host system location. This tape media is available under DOS/VS, OS/VS1 and OS/VS2 only.
 - #9412 -- 9-track 800 bpi.
 - #9413 -- 9-track 1600 bpi.
 - #9414 -- 9-track 6250 bpi.
- If magnetic tape is not used at the host system specify one of the following media which is available under DOS/VS only.
- #9421 -- 2316 Disk Pack.
 - #9422 -- 3336 Disk Pack Mdl I.
 - #9423 -- 3336 Disk Pack Mdl II.
 - #9424 -- 3348 Data Module.

The 3651 controller data will be sent via the specified media

If disk media is required, the IBM disk will be returned to the plant location after installation of the controller data.

[4] Cable: A 10' cable to the 3669 is provided as standard. If a longer cable is required, specify #9021, indicating length as a quantity of 20, 30 or 40.

[5] Store Loop Polarity Tester: Order Store Loop Polarity Tester, Part No. 1859559, Order Department. One is furnished at no charge to each 3660 site for testing store loop wiring.

[6] Additional DAA Cable: Specify #9101 if second DAA cable is required in configuration (for using switched 3872 modem to reload controller from host while system is being backed up from another store).

PRICES: Mdl		MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3651	A60	\$ 841	\$ 716	\$29,500	\$178
	B60	928	790	32,680	188

Plan Offering: Plan B Purchase Option: 55% Machine Group: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes -- between the A50 or B50 and the model A60 or B60 are not recommended for field installation. 3651 features cannot be interchanged between model 60 and a model 50 or 75. Model changes can be made in the field from model A60 to B60, A75 and B75; from B60 to B75. Changes from A to B models require the replacement of the integral disk storage. Adequate provision must be made for retaining the data on the replaced disk storage. All replaced parts become the property of IBM.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model A60 to Model B60	.....	\$3,180*
From Model A60 to Model A75	.....	\$4,100*
From Model A60 to Model B75	.....	\$7,800*
From Model B60 to Model B75	.....	\$4,100*

* Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model change involves the removal of parts which become the property of IBM."

SPECIAL FEATURES

STORAGE INCREMENT (#7680). Provides the 3651 with 8,192 bytes of additional control storage. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Storage Increment	#7680	\$ 32	\$ 27	\$ 637 \$ 5

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3653 POINT OF SALE TERMINAL

Purpose: An intelligent input/output terminal for the 3650 Programmable or Retail Store System to provide retail point-of-sale data collection, credit authorization, and inquiry functions. Self-contained intelligence allows the 3653 to continue most sales functions when disconnected from the 3650 system after a parameter initialization from either the Store Controller or magnetic wand reader.

Model 1 Not customer programmable. Attaches to 3651 mdl A25, B25, A50, B50, A75, B75, C75 and D75.

Model 1P Customer programmable. Optionally will function as a model 1 (non-customer programmable). Attaches to 3651 mdl A25, B25, A50, B50, A75, B75, C75 and D75. When attached to model A50 or B50 it can function as a model 1 only.

Basic storage is 36K bytes. This may be increased to 60K bytes through installation of Storage Increment features.

Highlights: A solid state, unitized packaged unit. It features data entry via the magnetic wand reader feature and a 10 numeric-key, 19 function-key keyboard ... step-by-step display of operator instructions ... printing of data in response to an inquiry ... display of numeric data as it is being key entered ... transmission of data to a 3651 for logging, over a unique transmission line capable of handling large volumes of short messages from many terminals ... a cash drawer with removable till.

Keyboard -- a ten-key numeric pad and nineteen function keys provide entry for variable source data. Types of transactions are indicated through the numeric pad, as well as data fields. Once a field has been entered, the depression of a function key causes one or more of the following functions to happen: editing for minimum and maximum field length, modulo check, price look-up, credit authorization, printing, transmission to the 3651 Store Controller, change in guidance or error feedback.

Printer -- a three station printer which produces a cash receipt or salescheck as well as a journal for each transaction.

Display -- an eight-digit numeric display plus "\$", ".", and "-" with five backlit captions shows numeric data as it is being keyed, extended prices, status codes for credit referrals, subtotals, totals, amount due, change, and refund amounts.

Operator Guidance -- step-by-step instructions are provided to the operator for each transaction by twenty backlit messages. Additional guidance is provided by the type of transactions shown on the numeric keys.

Status Indicators -- advise the operator that the terminal is ready for use, waiting for a response to an inquiry or transmission to the 3651, off-line from its 3651, or that the journal roll take-up spool is full.

PREREQUISITE: The 3650 system controller is a 3651 Store Controller Model 25, 50 or 75 ... see 3651 model 25, 50 or 75 for details.

Customer Responsibilities: [1] See 3650 in "Systems" for general description of customer responsibilities ... [2] The following statement is to be included in proposals:

"It is agreed that IBM will have no responsibility to provide warranty or maintenance service on an IBM 3653 Point of Sale Terminal when cash is contained in the unit. It shall be the purchaser's (customer's) responsibility to remove, control, and replace cash so that IBM can fulfill its warranty and maintenance obligations.

The exception to the above shall be when a failure occurs in the cash drawer and it cannot be opened prior to CE maintenance. In those cases the customer shall assign one of his personnel to assume responsibility for removal of the cash once the drawer has been opened."

Environment: See 3650 Programmable or Retail Store System in "Systems."

Maintenance: Installation of 3653s in the immediate sales area may preclude the acceptability of on-line repair due to the public scrutiny and loss of the selling location for customer service. In these cases, the customer should remove the failing terminal to a repair facility located within the store for subsequent repair. At this location the CE will repair and test the terminal on-line via a customer provided store loop termination.

Supplies: A black ribbon cartridge, IBM Part No. 1136970 or equivalent, should be used for machines installed prior to June, 1975. Machines installed after this date and those machines previously installed that are changed to the new ribbon drive mechanism should use IBM Part No. 1136660 or equivalent.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Journal Lock: #9322 if lock is desired on access cover to journal take-up roll, journal tape supply, and cash receipt tape supply. For additional or replacement locks and keys, see M 10000 pages.

[3] Till Cover with Lock: #9770 if top cover for cash drawer till is desired. For additional tills and covers and additional or replacement cash drawer locks and keys, see M 10000 pages.

[4] Till with Movable Bill Dividers: #9799 if movable bill dividers are desired. Otherwise, a till with fixed bill dividers will be supplied.

[5] Cash Drawer Lock: The 3653 is equipped with a cash drawer lock. A group of 25 unique lock numbers has been reserved to allow a customer to specify identical lock types on all terminals. This allows all cash drawers to be opened with the same key. If this is desired, specify one of the following types on the 3653 order:

#9101	#9106	#9111	#9116	#9121
9102	9107	9112	9117	9122
9103	9108	9113	9118	9123
9104	9109	9114	9119	9124
9105	9110	9115	9120	9125

If none is specified, a lock will be selected at random from a larger group of lock types, each 3653 will be shipped with two cash drawer keys. For additional or replacement keys, refer to M 10000 pages.

[6] Fractional Quantity Key: #9188 if the Fractional Quantity Selectable Function is chosen. Provides a key on the 3653 Keyboard with appropriate nomenclature.

PRICES:	Mdl	ATP/ MLC 5 yr	Purchase	MMMC
3653	1	\$ 124	\$3,790**	\$ 17
	1P	137	4,090**	20

Warranty: B Purchase Option: 55% Maintenance: D
Useful Life Category: 2 Per Call: 1
Termination Charge Months: 6 Termination Charge Percent: 20%
Upper Limit Percent: 5%

Model Changes: Model changes from model 1 to model 1P can be made in the field. All replaced parts of the base model become the property of IBM. The Functional Expansion Features (#4222, 4223 and 4224) cannot be interchanged between the 3653 mdl 1 and the 3653 mdl 1P and would remain with the customer if a model change is made.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From model 1 to model 1P \$ 425

SPECIAL FEATURES

FUNCTIONAL EXPANSION (#4222). [Mdl 1 only] Provides the 3653 with the capability to support additional functions.

Limitations: Not available for shipment after 3/25/77. #4222 is mutually exclusive with #4223 and #4224. **Maximum:** One. **Field Installation:** Yes. (Feature prices are based on plant installation. field installation of this feature requires the submission of an RPQ.)

FUNCTIONAL EXPANSION INCREMENT - TYPE I (#4223). [Mdl 1 only] Provides the 3653 with the capability to support additional functions. The capability provided by this feature is equal to that provided by Functional Expansion (#4222) ... see Note 1 below. **Limitations:** The third Type I Increment (#4223) cannot be installed on a 3653 with Functional Expansion Increment - Type II (#4224). #4223 is mutually exclusive with #4222 ... see Note 2 below for allowable configurations. **Maximum:** Three. **Field Installation:** Yes.

FUNCTIONAL EXPANSION INCREMENT - TYPE II (#4224). [Mdl 1 only] Provides the 3653 with the capability to support additional functions. The capability provided by this feature is twice that provided by Functional Expansion Increment - Type I (#4223) ... see Note 1. **Limitations:** Cannot be installed on 3653 with third Functional Expansion Increment - Type I (#4223). #4224 is mutually exclusive with #4222 ... see Note 2 below for allowable configurations. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** The 3653 must have two Functional Expansion Increment - Type I (#4223) installed.

STORAGE INCREMENT (#4225). [Mdl 1P only] Provides an additional 8,176 bytes of storage. **Maximum:** Three. **Field Installation:** Yes.

IML-READ ADAPTER (#4632). Provides a means to initialize

** Pilot Test applies: PTP Option Percent: 70%



3653 Point of Sale Terminal (cont'd)

3653 terminals when a 3651 Store Controller mdl A25, B25, A50, B50, A75, B75, C75 or D75 is unavailable or unable to provide the IML (Initial Machine Load). An adapter is provided for attaching an external tape cassette recorder and reading data previously recorded at a 3651 equipped with the IML-Write Adapter (#4633).
Maximum: One. **Field Installation:** Yes.

MAGNETIC WAND READER (#4944). A hand operated wand used to read single track delta distance encoded magnetic merchandise tickets, credit cards, and employee badges. The small light-weight wand attached via a four foot long, flexible cord, allows encoded merchandise tickets to be read without removing them from the merchandise. See Notes 3 and 4. **Maximum:** One. **Field Installation:** Yes.

MODIFIABLE KEYBOARD (#4990). Provides an alternate keyboard designed to aid in faster keying and in customizing to a user's requirements. Provides up to 16 department motor keys. **Maximum:** One. **Field Installation:** Not recommended.

Notes:

- (1) Order Confirmation of allowable or maximum combination of additional functions to be used with Functional Expansion Increments must be obtained
- (2) The table below defines Plant Installable configurations and the maximum allowable field upgrades of #4223 and #4224.

		Number of Functional Expansion Increments							
If Plant Installed Configuration is:	Type I (#4223)	0	0	1	1	2	2	2	3
	Type II (#4224)	0	0	0	0	0	0	1	0
Is Field Upgrade Possible?		Yes	Yes	Yes	Yes	Yes	Yes	No	*
Maximum Upgrade Above Plant Installed Configuration Allowable is:	Type I (#4223)	2	3*	1	.2*	1*	0	0	0
	Type II (#4224)	1	0	1	0	0	1	0	1*

* Customers who elect to purchase the third #4223 and anticipate later ordering #4224 should consider purchase of #4224 initially because field upgrade requires the replacement of the third #4223.

- (3) The minimum encoding specifications that must be met by suppliers of credit cards, merchandise tickets and employee badges will be furnished upon request.
- (4) See "Program Loading at Power-On Time" below for other use of wand.

Special Feature Prices:		ATP/ MLC 5 yr	Purchase	MMMC
For Mdl 1 Only				
Functional Expansion	#4222	\$ 3	\$ 72**	\$.50
Functional Expansion Increment				
- Type I	4223	3	72**	.50
- Type II	4224	6	142**	1.00
For Mdl 1P Only				
Storage Increment	4225	4	113	.50
For Mdl 1 and 1P				
IML-Read Adapter	4632	11	300**	2.00
Magnetic Wand Reader	4944	11	371**	2.00
Modifiable Keyboard	4990	4	90**	1.00

Program Loading at Power On Time

With IBM 3650 Retail Store System Release I

3651 Available: The IML and Parameter Initialization are loaded from the 3651 Store Controller.

3651 Unavailable: The IML must be obtained from a back-up 3651 Store Controller. Parameter Initialization is accomplished by wand using magnetically encoded tickets with the Magnetic Wand Reader (#4944) at each 3653.

With IBM Retail Store System Release II and Release III.

3651 Available: The IML, selectable functions (see Product Announcement 274-20, May 3, 1974) and Parameter Initialization are loaded from the 3651 Store Controller.

3651 Unavailable: The IML, selectable functions and Parameter Initialization requires one 3653 with the IML-Read Adapter (#4632) feature on each local loop and at each remote location.

With IBM 3650 Programmable Store System

3651 Available: The IML is loaded from the 3651 Store Controller.

3651 Unavailable: The IML requires one 3653 with the IML Read Adapter (#4632) feature on each local loop and at each remote location.

** Pilot Test applies: PTP Option Percent: 70%



3657 TICKET UNIT

Purpose: Magnetic Merchandise Ticket Input/Output Unit for the 3650 Programmable or Retail Store System.

Highlights: The 3657 is an on-line, high speed batch ticket encoder that can also perform batch ticket reading. Tickets are one inch high and contain a magnetic stripe 1/4 inch wide that runs the length of the ticket. The 3657 encodes this stripe with machine readable data which is read by the 3657 or by a wand reader available on the 3653 Point of Sale Terminal. Tickets also contain 2 lines of human readable data.

Two general types of tickets are used:

Label -- 1" x 1" self-adhering paper stock with a protective backing. The 1" x 1" label dimension applies to label and backing. The label when detached is approximately 0.940" x 0.940".

Tag -- 1" x 2" and 1" x 3" heavy-duty paper stock attached to merchandise by hanging or stapling.

Input -- 1", 2" or 3" roll stock or 2" individual tags.

Batch Reading -- Individual 2" tickets can be read from a cartridge. Tickets are fed from a removable cartridge and if successfully read directed to a ticket bin. Tickets that are unsuccessfully read are stacked into an identical cartridge. For additional or replacement cartridges, see M 10000 pages.

Output -- 1", 2" or 3" roll, strip or 2" individual tags.

Rated Speed -- Speed is dependent on length of ticket, number of header tickets, output method selected and competing traffic on the Loop.

Header tickets are print-only tickets which may be interspersed in the ticket output stream for batch or purchase order identification. Header tickets are not considered as merchandise identifiers.

Tickets per Minute

Ticket Size	Approximate Speed
1" Roll	500
2" Roll	250
3" Roll	167
2" Individual	130 (both make mode and read mode)

Printing -- The two lines of human readable data are printed with two identical eight wire matrix print heads. Characters are 0.117 inch high spaced 12 characters per inch. A 64 character set oriented to the retail industry is provided. Uses a cassette ribbon replaceable by the customer

Ticket Data Content

Ticket Size	No. Characters	
	Encode	Print
1"	19	22
2"	40	42
3"	60	64

Maximum: The maximum number of 3657s that can be attached to a 3651 depends on the number of positions available and the traffic volumes and response times required.

PREREQUISITE: An available Loop position.

Supplies: Merchandise tickets may be purchased from the IBM

SPECIFY: Voltage (AC, 1-phase, 3-wire, 60 Hz): #9901 for 115 V.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
	3657	1	\$ 685	\$ 583	\$23,850 \$75.50

Plan Offering: Plan B Purchase Option: 55% Maintenance: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

3659 REMOTE COMMUNICATIONS UNIT

Purpose: The IBM 3659 is a 2400 bps signal converter, used to provide store loop capability to establishments that are remotely located from the 3651 Store Controller mdl 50. The 3659 is used at each remote location to interface to common carrier provided voiceband private line (non-switched) channels for data transmission and to the store loop for Programmable or Retail Store System operations.

Model 1 Point-to-point remote communications unit.

Model 2 Multipoint remote communications unit.

Model Changes: At time of manufacture only.

Highlights: If a single remote site is served, the 3659 mdl 1 operation is duplex over a four-wire duplex line connecting the store to the 3651. If two or three remote sites are served, the 3659 mdl 1 operation is duplex over two-wire half-duplex lines connecting the stores to the 3651 in a serial manner. The use of the 3659 mdl 2 can provide service to up to twelve remote sites using a 4-wire duplex multipoint configuration.

Data Rate -- 2400 bps.

Equalization -- manually adjusted by an operator.

Problem Determination Aids: Included in each 3659 Remote Communications Unit are the following problem determination aids accessible to the operator:

- The unit may be wrap tested independently of the attached telecommunication line and store loop.
- The unit may be line tested (with telecommunication lines) and the modem at the 3651 or the adjacent 3659(s) independent of the store loop.

Communications Facilities

Common Carrier Non-switched Facilities -- Voiceband private line (non-switched) channel type 3002 (or equivalent).

Privately Owned Communications Facilities -- Equivalent to above.

Attachment to Communications Line -- Via one cable provided by the 3659 and a second cable to interface to the store loop.

Related Equipment -- The 3659 mdl 1 communicates with 3659 mdl 1s at other remote sites and/or an IBM 3872 Modem with #6101 or #6102 which is connected to the first or second Remote Loop Adapter special feature on the 3651 Store Controller Model 50. The IBM 3872 in this application may require an RPQ. See M 3872 page, this section.

The 3659 mdl 2 communicates with an IBM 3872 Modem without any special features or with #6302 only in a multipoint configuration. The 3872 is the control station modem in the multipoint network.

Customer Responsibilities: [1] The customer must provide (purchase, install, and maintain) all the necessary 3650 communications lines within the store. (Bulk Loop Cable is available from IBM. See M 10000 pages.) ... [2] See the M 2700 pages. The customer is responsible for the following ... obtaining assurance from the local common carrier that the telephone service provided will comply with the facilities described in the Bell System Technical Reference, "Data Communications Using Voiceband Private Line Channels", PUB 41004, Oct 1973, for a 3002 channel. Inform the common carrier that the speed of the operation will be 2400 bps.

PREREQUISITE: See "Teleprocessing Systems" in the GI section of the sales manual.

SPECIFY: Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
	3659	1	\$112	\$ 95	\$4,295 \$19.50
		2	200	170	7,670 29.50

Plan Offering: Plan B Purchase Option: 55% Maintenance: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%



3661 STORE CONTROLLER

Purpose: The control unit for a 3660 Supermarket Key-Entry System controls all functions of the 3663 Supermarket Terminals and provides for communications with the appropriate Host System. See "Communications Facilities" and "Prerequisites."

Model 1 A controller that houses a direct access diskette drive with a one-sided removable diskette.

Model 2 A controller with a diskette drive which accommodates a one or a two-sided removable diskette.

Highlights: Up to twelve (optionally eighteen) 3663 Supermarket Terminal Stations may be included in a 3660 Supermarket Key Entry System. One 3663 mdl 2 must be attached to the 3661 via local attachment (standard), and a second, or third 3663 mdl 2 may be attached locally to the 3661 via the optional 3663 Mdl 2 Local Attach Feature. All other 3663 Terminal Stations in the system, up to 11, or optionally up to 17, depending upon the number of locally attached stations, are attached via a store loop.

The 3661 with the 3663 Supermarket Terminals provides the following functions:

Customer Checkout

- Automatic pricing through code look-up in a master price file for up to 250 items standard and up to 1275 items with Additional Storage Feature (#1222).
- Automatic handling of multiple priced items in master file.
- Automatic handling of mix and match group pricing for items in the master price file.
- Automatic distribution of net sales by department.
- Automatic application of transaction discounts.
- Automatic computation of sales taxes with automatic handling of taxable and non-taxable items.
- Automatic control of maximum value of food stamps that should be accepted.
- Check verification facilities (negative with reason code) through look-up against a check verification record.
- Computation of change and trading stamps due.

All functions can be controlled to inhibit initiation by unauthorized personnel.

Store Support

- Preparation of the following accounting reports:
 - Store Summary
 - Individual cashier performance and tender reconciliation
 - Store office tender reconciliation
 - Sales by department (up to 9)
 - Distribution of miscellaneous income and disbursements by account.
- Current inquiries for department sales, cashier performance and cash position, and store cash position.
- Maintenance of master price file, check verification file, and operator authorization file.
- Productivity totals for each terminal station and store totals in 60 minute increments.
- Setting time and date for the internal clock.
- Customer checkout training mode.
- Printing miscellaneous messages received previously from the host.
- Entry of miscellaneous messages for subsequent retrieval by the host.
- Reporting of items returned by customers which are returned to stock.
- Updating the system with data received from the host.
- Shelf Label Preparation

Most store support functions may be performed concurrent with customer checkout. All functions are individually controlled to inhibit initiation by unauthorized personnel.

Data Accumulation

The 3661 accumulates the following by-product data for subsequent retrieval by the host. Item movement totals, all accounting and performance totals used in store reports, totals of taxes and taxable sales, productivity totals for each terminal station in sixty minute increments, exception events, and security sensitive events.

Host S/370 or 4300 Processor Transmission

The 3661 can transmit to the host, upon receiving a request, all of the data shown under "Data Accumulation" and other data or records in the 3661. The 3661 will clear out data or records upon request of the host. The 3661 can receive records, record changes, commands or other pertinent data from the host. See "Programming Support" section of the sales manual for description of host, programming support, and requirements. Host communications cannot be performed concurrent with customer checkout or store support procedures.

Communications Facilities: For in-store operation, a store loop provides the communications link to the 3663 supermarket terminals. See Installation Manual - Physical Planning, GA27-3079, for further information.

The communications adapter permits operation at the speed indicated over the facility shown below when using the appropriate modem. For information concerning the facility, see M 2700 pages.

1200 bps ... on facility C4.

PREREQUISITES:

- One 3663 Supermarket Terminal mdl 2 must be locally attached.
- A properly equipped S/370 or 4300 Processor must be available. The S/370 or 4300 Processor must contain a virtual storage processor. For minimum configuration requirements refer to S/370 or 4300 System Programming pages. In addition, either a 3704 or 3705 or an ICA must be used on a S/370 mdl 115, 125, 135, 135-3 or 138, or a Communications Adapter (#1601) feature on the 4331. 1200 bps external modems may be used with 3704, 3705, and ICA on S/370 mdl 115, 125, 135, 135-3 or 138, or a Communications Adapter (#1601) feature on the 4331. 1200 bps internal modems may be used with 3704, 3705, and ICA on S/370 mdl 115 or 125, or a Communications Adapter (#1601) feature on the 4331. For required features, see M 2700 pages.
- IBM has not tested the 3660 Supermarket Key-Entry System on non-virtual IBM systems. If a customer elects to establish communications with other than a virtual host system, the customer must understand that IBM does not assume responsibility for the resolution of any programming problems resulting from this system configuration.
- Communications Features -- one of the following arrangements must be used ... (1) Communications Feature with Clocking (#1482), EIA Interface (#3701), and an external modem operating at 1200 bps, or ... (2) Communications Feature with Clocking (#1482), 1200 bps Integrated Modem - Switched (#5501), and a Data Coupler.

SPECIFY: [1] Voltage (115 VAC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Communications: #9075 for Binary Synchronous Communications, or #9076 for Synchronous Data Link Control.

[3] System Attachment: identify the host processor(s) for the 3660 Supermarket Key-Entry System by specifying the following codes:

Processor	Code	Processor	Code
3115	#9589	3148	#9591
3125	9586	3155 II	9583
3135,3135-3	9581	3158	9587
3138	9590	3165 II	9584
3145,3145-3	9582	3168	9588
		3033	9592
		4331	9606
		4341	9607

[4] Modem Cable (external modem): A 10' cable to the modem is standard. If a longer cable is required, specify #9442 as a quantity of 20', 30', 40' or 50'.

[5] Store Loop Polarity Tester: Order Store Loop Polarity Tester, IBM Part No. 1859559.

One is furnished at no charge to each 3660 site for testing store loop wiring.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3661	1	423	\$ 360	\$12,620	\$ 92
	2	488	415	14,620	110

Plan Offering: Plan B Purchase Option: 55% Maintenance: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%



3661 Store Controller (cont'd)

Model Changes: Model 1 may be changed to a model 2. **Field Installation:** Yes. A model change requires the replacement of the diskette storage device. Adequate provision must be made for retaining data contained on the diskette by having the user remove it prior to the start of any conversion.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model 1 to Model 2 \$2,000*

* Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model change involves removal of parts which become the property of IBM."

SPECIAL FEATURES

ADDITIONAL STORAGE FEATURE (#1222). Provides an additional 8,192 bytes of storage. The user can utilize this either to increase the system's capacity for terminal stations from 12 to 18, or to increase the system's capacity for items from 250 to 1,275. **Maximum:** Two. **Limitation:** If two of these features are installed, the user cannot utilize both of them for the same purpose. **Field Installation:** Yes.

COMMUNICATIONS FEATURE WITH CLOCKING (#1482). Required for attachment to communications facilities through the 1200 bps Integrated Modem (#5501) or any external modem which does not have internal clocking. **Maximum:** One. **Field Installation:** Yes.

EIA INTERFACE (#3701). Provides the interface logic necessary to attach an external modem for communications to the host processor. Non-IBM modems may be attached subject to the Multiple Suppliers policy. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with 1200 bps Integrated Modem-Switched (#5501). **Prerequisites:** (1) External Modem Cable (#9442); for cable length specify quantity of 10, 20, 30, 40 or 50 feet ... (2) Communications Feature with Clocking (#1482).

1200 BPS INTEGRATED MODEM - SWITCHED (#5501). Provides the point-to-Point operation over switched network facilities using manual originate/auto answer for establishing connection. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with EIA Interface (#3701). **Prerequisites:** Communications Feature with Clocking (#1482). User must provide a Data Coupler type CBS or equivalent.

SCALE ADAPTER (#6672). Allows attachment of an electronic scale (Toledo 8210 with display or equivalent) for use with a locally attached 3663 mdl 2. Specify #9576 if scale will be used with first 3663 mdl 2, or #9577 if it will be used with second 3663 mdl 2, or #9578 if it will be used with the third 3663 mdl 2. **Maximum:** Three. **Note:** See customer responsibilities under 3660 in "Systems" pages. **Field Installation:** Yes.

3663 MDL 2 LOCAL ATTACH FEATURE (#8110). Provides for the local attachment of a second 3663 mdl 2. **Maximum:** One. **Field Installation:** Yes. **Note:** The first 3663 mdl 2 attachment is provided in the basic 3661.

LOCAL ATTACHMENT FEATURE FOR THIRD 3663 MDL 2 (#8111). Provides for the third local attachment of a 3663 mdl 2 terminal station. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** 3663 Mdl 2 Local Attach Feature (#8110).

Special Feature Prices:		ETP/ MAC/ MLC		Purchase	MMMC
		MRC	2 yr		
Add'l Storage Feature	#1222	\$ 32	\$ 27	\$ 637	\$5.00
Comm Fea w Clocking	1482	19	16	710	3.00
EIA Interface	3701	12	10	424	4.00
1200 bps Intgrtd Modem	5501	25	21	840	6.50
Scale Adapter	6672	6	5	143	.50
3663 Mdl 2 Local Attach	8110	11	9	292	3.00
Local Attachment Feature for 3rd 3663 mdl 2	8111	14	12	365	4.00

**3663 SUPERMARKET TERMINAL**

Purpose: In conjunction with the IBM 3651 mdl A25, B25, A60, B60, A75, B75, C75, D75 Store Controller, or the IBM 3661 Store Controller, the 3663 Supermarket Terminal provides the input and output facilities necessary to process transactions in a supermarket environment. It replaces and extends the function of mechanical supermarket registers.

Model 1 Station and Control — one printer, display, keyboard, cash drawer and control segment for operating one checkstand. **LIMITATION:** Not available in conjunction with the 3651 Store Controller mdl A25, B25, A75, B75, C75 or D75.

Model 1P Station and Control — one printer, display, keyboard, cash drawer, and customer programmable control segment for operating one checkstand. **LIMITATION:** Not available in conjunction with the 3651 Store Controller mdl A60 or B60 - Supermarket, or with the 3661 Store Controller.

Model 2 Station Only — one printer, display, keyboard, and cash drawer that attaches to a 3663 mdl 1, 1P, 3 or 3P, or to the 3661 Store Controller, for operating additional checkstands. One 3663 mdl 2 must be attached to the 3661, a second and a third 3663 mdl 2 may be attached via #8110 and #8111 respectively. (#8110 is a prerequisite for #8111.)

Model 3 Control Segment Only — a control segment for controlling one, or optionally up to three, 3663 mdl 2s. **Limitation:** Not available in conjunction with the 3651 Store Controller mdl A25, B25, A60, B60, A75, B75, C75 or D75. **NOTE:** The first 3663 mdl 2 attachment is provided in the basic 3663 mdl 3. **Prerequisite:** One 3663 mdl 2 must be attached to the 3663 mdl 3.

Model 3P Control Segment Only — a customer programmable control segment for controlling one, or optionally up to three, 3663 mdl 2s. **LIMITATIONS:** Not available in conjunction with the 3651 Store Controller mdl A60 or B60 - Supermarket, or with the 3661 Store Controller. **NOTE:** The first 3663 mdl 2 attachment is provided in the basic 3663 mdl 3P. **PREREQUISITE:** One 3663 mdl 2 must be attached to the 3663 mdl 3P.

Highlights: Has a storage area for each station into which keyed (or scanned if the 3666 or 3667 Checkout Scanner is attached) data is entered prior to being transmitted to the IBM 3651 Store Controller mdl A25, B25, A60, B60, A75, B75, C75 or D75 or the IBM 3661 Store Controller. Checks for code accuracy, sequence control, field length, and correct number of fields. Another storage area for each station is used for receiving a previously entered message after being processed at the 3651 mdl A25, B25, A60, B60, A75, B75, C75 or D75 or the 3661. Upon receiving messages, data is edited and transferred to the printer and display.

With the appropriate special adapter features, the 3663 can attach non-IBM coin and trading stamp dispensers, non-IBM front end scales, and IBM 3666 or 3667 Checkout Scanners. In addition, a Document Insert feature can be added to the printer to allow "franking" (printing special data) on checks.

Keyboard: Have a ten-key numeric pad plus function keys. In part these include department keys, special item modification keys (for price, quantity and weight entries), tender payment keys, coupon entry keys, and other related supermarket required keys. See the IBM 3660 Supermarket System Introduction Manual GA27-3076 or the IBM 3650 Programmable Store System Introduction Manual, GA27-3163 for details.

Printer: Has two tape print locations as standard. Using a horizontal radial printing technique, the first tape printed is the customer receipt. The second tape is for summary journal data. An optional Document Insert feature position may be added. Alphanumeric printing is accomplished with a dot matrix print head. Printing in each position is up to 30 characters. Customer receipt tape printing is at 80 lines per minute. Summary journal tape printing is at 50 lines per minute. Document Insert printing is at 35 lines per minute. Shelf labels can be printed at 3-4 labels per minute, depending upon the size of the label.

Cash Drawer: Has a removable and lockable till with five spring-weighted bill compartments and five coin compartments. A 3-position lock controls power to the station and manually opens the drawer regardless of power status. The key is removable in any position. No terminal function can be initiated with the drawer open.

Display: A variable character display panel allows displaying an alphameric message of up to 22 characters in length. Characters are .4 inches high and variable in width.

Communications: Provided over two 2-wire customer provided loops called store loops. Messages from the 3651 mdl A25, B25, A60, B60, A75, B75, C75 or D75 or the 3661 are monitored by the 3663 Supermarket Terminal for terminal destination. A pluggable address scheme is provided for terminal numbering. See Installation Manual - Physical Planning, GA27-3079, for the 3660 Supermarket System and Installation Manual - Physical Planning, GA27-3167 for the 3650 Programmable Store System.

Packaging: The standard station can be specified fully integrated (all I/O segments under a single cover) or integrated with a remote display. An optional special feature with a specify code will provide a distributed station (I/O segments separately covered to allow location flexibility).

PREREQUISITES:

With 3651 Store Controller mdl A25, B25, A75, B75, C75 or D75: (1) An available store loop position ... (2) For attachment of a 3663 mdl 2 to the store loop, a 3663 mdl 1P with a Model 2 Attachment feature is a prerequisite, unless the 3663 mdl 2 is attached to a 3663 mdl 3P. For attachment of a 3663 mdl 2 to a 3663 mdl 3P, a Model 2 Attachment Feature (#4900) is a prerequisite if it is the second 3663 mdl 2 attached to the 3663 mdl 3P ... a 3rd Model 2 Attachment Feature (#4901) is a prerequisite if it is the third 3663 mdl 2 attached to the 3663 mdl 3P. **NOTE:** The first 3663 mdl 2 attachment is provided in the basic 3663 mdl 3P.

With 3651 Store Controller mdl A60 or B60: (1) A 3669 Store Communications Unit and an available store loop position ... (2) a 3663 mdl 1 with a Model 2 Attachment (#4900) feature is prerequisite for each 3663 mdl 2 to be added to a store loop.

With 3661 Store Controller: (1) An available local attachment on the 3661 or a store loop position. (**NOTE:** One 3663 mdl 2 must be attached to the 3661 via the standard local attachment ... one or two additional 3663 mdl 2s can be locally attached via optional Local Attachment Features) ... (2) For attachment of a 3663 mdl 2 to the store loop a 3663 mdl 1 with a Model 2 Attachment Feature is a prerequisite, unless the 3663 mdl 2 is attached to a 3663 mdl 3. For attachment of a 3663 mdl 2 to a 3663 mdl 3, a Model 2 Attachment Feature (#4900) is a prerequisite if it is the second 3663 mdl 2 attached to the 3663 mdl 3 ... a 3rd Model 2 Attachment Feature (#4901) is a prerequisite if it is the third 3663 mdl 2 attached to the 3663 mdl 3. **NOTE:** The first 3663 mdl 2 attachment is provided in the basic 3663 mdl 3.

Customer Responsibilities: See 3650 and 3660 in "Systems" section of sales manual. The following statement is to be included in proposals:

"It is agreed that IBM is relieved of responsibility for loss of funds contained in, dispensed by or associated with any machine under an IBM Agreement after its delivery to the customer. It is also agreed that IBM will have no responsibility to provide warranty or maintenance service on any such machine when such machine contains funds. It shall be the customer's responsibility to remove, control, and replace or reload funds so that IBM can fulfill its warranty and maintenance obligations.

The exception to the above shall be when a failure occurs in the cash drawer of any machine under the Agreement, and it cannot be opened prior to maintenance by IBM. In those cases, the customer shall assign one of its personnel to assume responsibility for removal of the funds once the drawer has been opened."

Maintenance: Agreement for IBM to install and maintain the 3663 must be reviewed

Supplies: A black ribbon, IBM Part No. 1136970 or equivalent, should be used for machines installed prior to June, 1975. Machines installed after this date and those machines previously installed that are changed to the new ribbon drive mechanism should use IBM Part No. 1136660 or equivalent.

See SRL manual "3660 Supermarket System Introduction" GA27-3076 for roll paper and Document Insert forms specifications.

SPECIFY: [1] Voltage (115 VAC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Packaging: #9547 for fully integrated; #9549 for integrated but with remote display. Specify #9548 for distributed; special feature Distributed Station (#3425) is a prerequisite. Specify one specify code for each 3663 mdl 1 or mdl 1P and one for each 3663 mdl 2; if #9548, feature code #3425 for each 3663 mdl 1, mdl 1P and mdl 2 also. Specify codes need not be the same for all 3663s in a store. Changes in packaging of installed terminals are not permitted in the field.

[3] Cabling: refer to the Installation Manual - Physical Planning (GA27-3079) for the 3660 Supermarket System and Installation Manual - Physical Planning, GA27-3167 for the 3650 Programmable Store System.



3663 Supermarket Terminal (cont'd)

[4] TARE Key: #9737 for providing a keytop that has the word "TARE" on it to replace the lower blank key on the 3663. Do not specify if Optional Keyboard (specify code #9488) is ordered. Delete this specify on existing orders pending if Optional Keyboard (specify code #9488) is to be added. NOTE: The use of tare capability is mandatory in the State of California.

[5] Keytop Arrangement: Specify #9353 for a reversed keypad (top row -- 7, 8, 9; middle row -- 4, 5, 6; bottom row -- 1, 2, 3). **Limitation:** In the 3660 Supermarket Scanning and Key Entry Systems, if installed on one 3663 mdl 1 or 2, it must be installed on all 3663 mdl 1s and 2s in the store. Do not specify if Optional Keyboard (specify code #9488) is ordered. Delete this specify on existing orders pending if Optional Keyboard (specify code #9488) is to be added. **Field Installation:** Not recommended.

[6] Cash Drawer Locks: A separate group of 25 lock numbers has been set aside to allow a customer to use the same key in multiple terminals. If this is desired, specify one of the following locks on the 3663 order.

#9101	#9106	#9111	#9116	#9121
9102	9107	9112	9117	9122
9103	9108	9113	9118	9123
9104	9109	9114	9119	9124
9105	9110	9115	9120	9125

If this option is not specified, a lock will be randomly selected from another, larger, group of unique lock numbers.

[7] Till Option: Specify #9799 for shipment of a till with adjustable bill dividers. If this option is not selected, an assembled till with fixed bill dividers will be shipped.

[8] Keyboard Type: One keyboard type must be specified for each 3663 mdl 1, 1P and 2. Specify code #9020 will provide the Regular Keyboard with the ten-key pad positioned on the left. This keyboard may have up to nine department keys. **LIMITATION:** In the 3660 Supermarket Scanning and Key Entry System, if installed on more than one 3663 in the local or backup store, all key assignments must be the same. Not compatible with Optional Keyboard (#9488). In the 3650 Programmable Store System, all 3663 mdl 2 terminals attached to the same 3663 mdl 3P must have the same type of keyboard and the same key assignments -- paired mdl 1P and 2 terminals must have the same type of keyboard and the same key assignments. **Field Installation:** Not recommended.

Specify code #9488 will provide the Optional Keyboard with the ten-key pad positioned in the center. The left to right dimension is 16-1/2" in the distributed version, special feature code #3425, (no change in the size of the integrated version). An expanded keytop shipping group is included to provide variety in colors, heights and sizes of blank keytops. Also, a means is provided to allow placing single or double sized keys in many locations. **LIMITATIONS:** In the 3660 Supermarket Scanning and Key Entry Systems, this keyboard must be installed on all 3663s in a store and is not compatible with the Regular Keyboard (#9020). All key assignments must be the same. In the 3650 Programmable Store System, all 3663 mdl 2 terminals attached to the same 3663 mdl 3P must have the same type keyboard and the same key assignments -- paired mdl 1P and 2 terminals must have the same type of keyboard and the same key assignments. **Field Installation:** Not recommended. **Customer Responsibilities:** See 3650 Programmable Store System and 3660 Supermarket System in "Systems" pages. **Prerequisites:** In the 3660 Scanning System, special feature #3880 is required on all 3663 mdl 1s in the store if any of the following features are installed in the same store:

Coin Dispenser Adapters -- #1811, 1812, 1821, 1822
Stamp Dispenser Adapters -- #7311, 7312, 7321, 7322

PRICES:	Mdl	ATP/ MLC 5 yr	Purchase*	MMMC
3663	1	\$ 191	\$5,990	\$28.50
	1P	204	6,450	31.50
	2	92	2,600	19.00
	3	89	2,580	15.00
	3P	98	2,980	18.50

Plan Offering: Plan B Warranty: B Machine Group: D
Purchase Option: 55% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 6 Termination Charge Percent: 20%
Upper Limit Percent: 5%

Model Changes: Not recommended for field installation except from model 1 to 1P and from model 3 to 3P. All replaced parts become the property of IBM.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model 1 to Model 1P \$700**
From Model 3 to Model 3P \$700**

** Customer price quotations and order acknowledgement letters for purchase must state: "Installation of this model change involves the removal of parts which become the property of IBM."

SPECIAL FEATURES

The following features are for the model 1, 1P and 2 unless otherwise noted.

DISTRIBUTED STATION (#3425). Provides distributed packaging; all I/O segments separately covered to allow location flexibility. **Field Installation:** Not recommended. **Prerequisites:** Specify code #9548 on 3663 mdl 1, mdl 1P or mdl 2. **Maximum:** one per 3663 mdl 1, 1P or 2

DOCUMENT INSERT (#3451). Provides a third location on the printer for printing on an inserted form (refer to 3660 Supermarket Systems Introduction SRL for details on forms). **Maximum:** One on each 3663 mdl 1, 1P or 2. **Limitation:** In the 3660 Supermarket Scanning and Key Entry Systems, if this feature is desired for a model 1 on the store loop, it must be installed on the attached model 2 (if any), and vice versa. In the 3660 Supermarket Scanning and Key Entry Systems, if this feature is desired for a model 2 attached to a model 3, it must also be installed on all other model 2s attached to that model 3. **Field Installation:** Not recommended.

JOURNAL LOCK (#4660). Provides a locking internal security cover for the summary journal take-up spool. **Maximum:** One. **Field Installation:** Yes.

NUMERIC KEY PAD LOCK (#5330). Provides a lock to prevent any depression of the numeric keys or delimiter key when an error condition has been detected. **Maximum:** One. **Field Installation:** Not recommended.

RECEIPT STATION HALF SPACE (#6226). Vertical spacing in the receipt station is modified to provide half normal vertical spacing, i.e., 10 vertical spaces per inch. The spacing may be manually switched to normal (5 lines per inch). This feature also detects end of label and start of label as well as "End of Forms." Depending upon label size, approximately 3-4 labels per minute can be printed. **Limitations:** Only one printer per Control Segment can be used when printing shelf labels. 3663s attached locally to the 3661 cannot install this feature. **Maximum:** One per 3663. **Field Installation:** Yes.

The following features are for the models 1, 1P, 3 and 3P unless otherwise noted.

STORAGE EXPANSION FEATURE (#1580). [Mdl 1P and 3P only] Provides the capability of installing storage increments 4 through 9. **Maximum:** One. **Field Installation:** Yes.

CHECKOUT SCANNER ADAPTER (#1761). [Mdl 1 only] Allows attachment of an IBM 3666 or 3667 Checkout Scanner for operation with the 3663 mdl 1 to which it is attached. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed when 3663 is attached to the 3661 Store Controller. Cannot be installed on a 3663 if #1763 is installed. *Cannot be installed on mdl 1P, however, if this feature was previously installed on a model which converts to a mdl 1P, it may remain after the conversion. NOTE: This feature is to be used only in 3660 systems at an EC level prior to 349962. For 3660 systems at EC 349962 or later and for Programmable Store Systems use feature code #1763.*

2ND CHECKOUT SCANNER ADAPTER (#1762). [Mdl 1 only] Allows attachment of a 3666 or 3667 Checkout Scanner for operation with an attached 3663 mdl 2. **Maximum:** One. **Field Installation:** Yes, starting July, 1975. **Limitation:** Cannot be installed when 3663 is attached to the 3661 Store Controller. **Prerequisites:** #1761, #4900 and the 3663 mdl 2.

CHECKOUT SCANNER ADAPTER TYPE 2 (#1763). [Mdl 1 or 1P only] Allows attachment of an IBM 3666 or 3667 Checkout Scanner for operation with the 3663 mdl 1 or 1P to which it is attached. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed when the 3663 is attached to the 3661 Store Controller. Cannot be installed when #1761 is attached. Can only be attached to the 3663 mdl 1 or 1P.

2ND CHECKOUT SCANNER ADAPTER TYPE 2 (#1764). [Mdl 1 or 1P only] Allows attachment of an IBM 3666 or 3667 Checkout Scanner for operation with an attached 3663 mdl 2. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed when the 3663 is attached to the 3661 Store Controller. Can only be attached to a 3663 mdl 1 or 1P. **Prerequisites:** #1763, #4900 and the 3663 mdl 2.

COIN DISPENSER ADAPTER TYPE 1 (#1811). Allows attachment of a 12 column Coin Dispenser (Anker RG11SOA or equivalent). **Specify:** #9061 if Coin Dispenser will be used for the station portion of a 3663 mdl 1 or 1P or for the first 3663 mdl 2 attached to a 3663 mdl 3 or 3P, or #9062 if it will be used for a 3663 mdl

* Pilot Test applies: PTP Option Percent, 70%.



3663 Supermarket Terminal (cont'd)

2 attached to a 3663 mdl 1 or 1P or for the second 3663 mdl 2 attached to a 3663 mdl 3 or 3P. For the third 3663 mdl 2 attached to a 3663 mdl 3 or 3P, specify #9062 in conjunction with a second Coin Dispenser Adapter Type 1 (#1811) and a Third Model 2 Attachment (#4901) as prerequisites. **Maximum:** One on mdl 1 or 1P ... two on mdl 3 or 3P. **Limitation:** Not available if coin Dispenser Adapter Type 2 (#1821) is installed. **Field Installation:** Yes.

2ND COIN DISPENSER ADAPTER TYPE 1(#1812). Allows attachment of a second 12 column Coin Dispenser (Anker RG11SOA or equivalent). **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** #1811.

COIN DISPENSER ADAPTER TYPE 2 (# 1821). Allows attachment of an 8 column Coin Dispenser (NCR 410 or equivalent). **Specify: #9063** if Coin Dispenser will be used for the station portion of a 3663 mdl 1 or 1P or for the first 3663 mdl 2 attached to a 3663 mdl 3 or 3P, or **#9064** if it will be used for a 3663 mdl 2 attached to a 3663 mdl 1 or 1P or for the second 3663 mdl 2 attached to a 3663 mdl 3 or 3P. For the third 3663 mdl 2 attached to a 3663 mdl 3 or 3P, specify #9064 in conjunction with a second Coin Dispenser Adapter Type 2 (#1821) and a Third Model 2 Attachment (#4901) as prerequisites. **Maximum:** One on mdl 1 or 1P ... two on mdl 3 or 3P. **Limitation:** Not available if Coin Dispenser Adapter Type 1 (#1811) is installed. **Field Installation:** Yes.

2ND COIN DISPENSER ADAPTER TYPE 2 (#1822). Allows attachment of a second 8 column Coin Dispenser (NCR 410 or equivalent). **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** #1821.

STORAGE INCREMENT (#3880). Provides 2,048 additional positions of storage. All replaced parts become the property of IBM. **Limitation:** If this feature is required on one 3663 mdl 1 or mdl 3, it must be installed on all mdl 1s and 3s in the store. **Maximum:** One on 3663 mdl 1 and mdl 3; nine on mdl 1P and mdl 3P. **Field Installation:** Yes. **Prerequisite:** Installation of more than 3 Storage Increments (mdl 1P and 3P only) requires one Storage Expansion Feature (#1580).

IML-READ ADAPTER (#4634). (Mdl 1P and 3P only) Provides a means to initialize 3663 terminals when a 3651 Store Controller mdl A25, B25, A75, B75, C75 or D75 is unavailable or unable to provide the IML (Initial Machine Load). An adapter is provided for attaching an external tape cassette recorder (refer to IBM 3650 Retail Store System Introduction Manual, GA27-3075) and reading data previously recorded at a 3651 equipped with the IML-Write Adapter (#4633). **Maximum:** One. **Field Installation:** Yes.

MODEL 2 ATTACHMENT (#4900). Allows attachment of one 3663 mdl 2 to a 3663 mdl 1 or 1P, or allows attachment of the second 3663 mdl 2 to a 3663 mdl 3 or 3P. **Maximum:** On mdl 1 or 1P, one ... on mdl 3 or 3P, one. **Field Installation:** Yes. **Note:** The basic 3663 mdl 3 or 3P provides for attachment of the first 3663 mdl 2 as a standard feature.

SCALE ADAPTER (#6671). Allows attachment of an electronic scale (Toledo 8210 with display or equivalent). **Specify: #9561** if Scale will be used for the station portion of a 3663 mdl 1 or 1P or for the first 3663 mdl 2 attached to a 3663 mdl 3 or 3P, or **#9562** if it will be used for a 3663 mdl 2 attached to a 3663 mdl 1 or 1P or for the second 3663 mdl 2 attached to a 3663 mdl 3 or 3P, or **#9563** if it will be used for the third 3663 mdl 2 attached to a 3663 mdl 3 or 3P. **Maximum:** Two on mdl 1 or 1P ... three on mdl 3 or 3P. **Note:** See Customer Responsibilities under 3650 and 3660 in "Systems: pages. **Field Installation:** Yes. **Prerequisite:** For the mdl 1P and 3P the 3650 Programmable Store System Point of Sale Application/Supermarket Environment Program Product (5748-D21) is a mandatory requirement in all states conforming to the National Bureau of Standards Handbook #44 for Weights and Measures.

STAMP DISPENSER ADAPTER TYPE 1 (#7311). [Mdl 1 only] Allows attachment of a Stamp Dispenser (Anker TVC 715 or equivalent). **Specify: #9571** Stamp Dispenser will be used with model 1, or **#9572** if it will be used with an attached model 2. **Maximum:** One. **Limitation:** Not available if Stamp Dispenser Adapter Type 2 (#7321) is installed. Not available on 3663 mdl 3. **Field Installation:** Yes.

2ND STAMP DISPENSER ADAPTER TYPE 1 (#7312). [Mdl 1 only] Allows attachment of a second Stamp Dispenser (Anker TVC 715 or equivalent). **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** #7311, #4900 and the 3663 mdl 2.

STAMP DISPENSER ADAPTER TYPE 2 (#7321). [Mdl 1 only] Allows attachment of a Stamp Dispenser (NCR 414 or equivalent). **Specify: #9573** if Stamp Dispenser will be used with model 1, or **#9574** if it will be used with an attached model 2. **Maximum:** One. **Limitation:** Not available if Stamp Dispenser Adapter Type 1 (#7311) is installed. Not available on 3663 mdl 3. **Field Installation:** Yes.

2ND STAMP DISPENSER ADAPTER TYPE 2 (#7322). [Mdl 1

only] Allows attachment of a second Stamp Dispenser (NCR 414 or equivalent). **Maximum:** One. **Limitation:** Not available on 3663 mdl 3. **Field Installation:** Yes. **Prerequisites:** #7321, #4900 and the 3663 mdl 2.

STANDALONE INITIAL MACHINE LOAD (#7555). [Mdl 1 and 3 only] Allows a user-provided tape cassette to be attached to a 3663 Supermarket Terminal mdl 1 or mdl 3 to provide IML capability if required when the 3663 is operating in standalone mode. **Maximum:** One. **Limitation:** The IML feature on a 3663 mdl 1 cannot be used to IML a 3663 mdl 3; therefore when there is a mixture of mdl 1s and mdl 3s, the feature should be installed on a mdl 3 instead of a mdl 1. **Field Installation:** Yes. **Prerequisite:** A 3661 Store Controller. **Note:** One IML feature will support all terminals on the store loop. User-provided tape cassette must meet requirements defined in the IBM 3660 Supermarket Systems, Key Entry System Introduction, GA27-3111.

The following feature is for the 3663 mdls 3 and 3P only

3RD MODEL 2 ATTACHMENT (#4901). Allows attachment of the third 3663 mdl 2 to a 3663 mdl 3 or 3P. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** #4900 on 3663 mdl 3 or 3P.

Special Feature Prices:	ATP/ MLC	5 yr	Purchase*	MMMC
For Model 1 Only				
Ckout Scanner Adapter	1761	\$66	\$2,210	\$5.50
2nd Ckout Scanner Adapter	1762	19	600	2.50
Stamp Disp Adptr Type 1	#7311	22	690	3.00
2nd Stamp Dist Adptr Type 1	7312	NC	NC	NC
Stamp Disp Adptr Type 2	7321	24	755	3.00
2nd Stamp Disp Adptr Type 2	7322	NC	NC	NC
For Model 1 and 1P Only				
Ckout Scanner Adptr Type 2	1763	66	2,210	5.50
2nd Ckout Scanner Adptr Ty 2	1764	19	600	2.50
For Model 1, 1P and 2 Only				
Distributed Station	#3425	\$ 4	160	NC
Document Insert	3451	6	171	1.00
Journal Lock	4660	1	25	NC
Numeric Key Pad	5330	2	75	NC
Receipt Station Half Space	6226	23	600	5.00
For Model 1 and 3 Only				
Standalone Initial Mach Load	7555	17	450	3.50
For Model 1P and 3P Only				
Storage Exp. Feature	1580	8	200	1.50
IML-Read Adapter	4634	11	300	2.00
For Model 1, 1P, 3 and 3P Only				
Coin Dispenser Adptr Type 1	1811	20	640	2.50
2nd Coin Dispen Adptr Type 1	1812	NC	NC	NC
Coin Dispenser Adptr Type 2	1821	20	640	2.50
2nd Coin Dispen Adptr Type 2	1822	NC	NC	NC
Storage Increment	3880†	6	142	1.00
Model 2 Attachment	4900	12	292	3.00
Scale Adapter	6671	4	143	.50
For Model 3 and 3P Only				
3rd Model 2 Attachment	4901	16	365	4.00

* Pilot Test applies: PTP Option Percent: 70%.

† Customer price quotations and customer order acknowledgement letters for most state: "Installation of this feature involves removal of parts which become the property of IBM."



IBM 3666 CHECKOUT SCANNER

Purpose: Fixed head optical reader for the 3650 Programmable Store System and 3660 Supermarket System.

Highlights: Reads the regular (Version "A") and the zero suppression (Version "E") industry standard Universal Product Code (UPC) symbols on manually fed supermarket items placed symbol down on the scanner window ... when used with the 3650 Programmable Store System, can also read industry standard European Article Numbering (EAN-13) symbols (when used with the 3650 Programmable Store System, interpretation of all symbols is done by the user application program) ... item velocity meets the industry's Symbol Standardization Subcommittee requirement for up to 100 inches per second ... packaged as the front end of a total checkstand design ... one 3666 can operate with one 3663 mdl 1, mdl 1P or mdl 2 Supermarket Terminal. The 3666 is 38 inches (96.5 cm) high. The 3666 contains a laser system which complies with the safety standards of the United States Department of Health, Education, and Welfare (Performance Standard, Laser Products, August 2, 1976 - Class 1, 21 CF-R Subchapter J) only when properly attached to an IBM 3663 mdl 1 or 1P with features #1761, #1762 or #1763, #1764 or equivalent.

PREREQUISITES: If the 3666 is to operate with a 3663 mdl 1 or mdl 1P, the 3663 mdl 1 or mdl 1P requires Checkout Scanner Adapter (#1761) or Checkout Scanner Adapter Type 2 (#1763). If the 3666 is to operate with a 3663 mdl 2, the 3663 mdl 1 or mdl 1P to which that 3663 mdl 2 is attached requires either Checkout Scanner Adapter Type 2 (#1763) and 2nd Checkout Scanner Adapter Type 2 (#1764), or Checkout Scanner Adapter (#1761) and 2nd Checkout Scanner Adapter (#1762).

Customer Responsibility: Refer to Installation Manual - Physical Planning, GA27-3079, for the 3660 Supermarket System for correct ambient light intensity requirement. A number of states presently have, and others are considering the adoption of, regulations governing the use of laser products. Users should determine the extent of regulation in their state. New York state currently requires an attachment to the checkstand. This user-supplied feature must be in place prior to installation of the 3666. Details are available from the N. Y. State Department of Labor, Division of Safety and Health, Two World Trade Center, New York, N. Y. 10047.

Supplies: A window, Part No. 5563123, will need to be ordered to replace the existing window periodically as it becomes excessively scratched. See M 10000 pages for ordering instructions.

For copies of the UPC Symbol Specification and the UPC Guidelines Manual, write to:

Distribution Codes, Inc.
401 Wythe Street
Alexandria, Virginia 22314

For copies of the General Specifications for the Article Symbol Marking (EAN) write to:

Secrétaire General E. A. N.
Rue de la Chancellerie 14 - 1000, Bruxelles

SPECIFY: [1] Cable Requirements: See the 3663 Supermarket Terminal "Machines" pages.

[2] Packaging: If machine is to be installed in N. Y. State, specify #9550 for additional labeling to meet current regulations. If machine is to be installed in the State of Texas, specify #9551 for additional labeling to meet current requirements.

PRICES:	Mdl	ATP/ MLC 5 yr	Purchase*	MMMM
	3666	1	\$ 147	\$ 3,560 37.50

Warranty: B Purchase Option: 55% Machine Group: D
Useful Life Category: 2 Per Call: 1
Termination Charge Months: 6 Termination Charge Percent: 20%
Upper Limit Percent: 5%

* Pilot Test applies: PTP Option Percent: 70%

IBM 3667 CHECKOUT SCANNER

Purpose: Fixed head optical reader for the 3650 Programmable Store System and 3660 Supermarket System. The 3667 is 28 inches (71.1 cm) high and it is particularly adaptable to:

- Checker unload mode of checkout
- Seated checker operation

Highlights: Reads the regular (Version "A") and the zero suppression (Version "E") industry standard Universal Product Code (UPC) symbols on manually fed supermarket items placed symbol down on the scanner window ... when used with the 3650 Programmable Store System, can also read industry standard European Article Numbering (EAN-13) symbols (when used with the 3650 Programmable Store System, interpretation of all symbols is done by the user application program) ... item velocity meets the industry's Symbol Standardization Subcommittee requirement for up to 100 inches per second ... packaged as the front end of a total checkstand design ... one 3667 can operate with one 3663 Supermarket Terminal mdl 1, mdl 1P or mdl 2. The 3667 contains a laser system which complies with the safety standards of the United States Department of Health, Education, and Welfare (Performance Standard for Laser Products, August 2, 1976 - Class 1, 21 CFR Subchapter J) only when properly attached to an IBM 3663 mdl 1 or mdl 1P with feature #1761, #1762 or #1763, #1764 or equivalent.

Prerequisites: If the 3667 is to operate with a 3663 mdl 1 or mdl 1P, the 3663 mdl 1 or mdl 1P requires Checkout Scanner Adapter (#1761) or Checkout Scanner Adapter Type 2 (#1763). If the 3667 is to operate with a 3663 mdl 2, the 3663 mdl 1 or mdl 1P to which that 3663 mdl 2 is attached requires either Checkout Scanner Adapter Type 2 (#1763) and 2nd Checkout Scanner Adapter Type 2 (#1764), or Checkout Scanner Adapter (#1761) and 2nd Checkout Scanner Adapter (#1762).

Customer Responsibility: Refer to Installation Manual - Physical Planning, GA27-3079, for the 3660 Supermarket System for correct ambient light intensity requirement. A number of states presently have, and others are considering the adoption of, regulations governing the use of laser products. Users should determine the extent of regulation in their state. New York state currently requires an attachment to the checkstand. This user-supplied feature must be in place prior to installation of the 3667. Details are available from the N. Y. State Department of Labor, Division of Safety and Health, Two World Trade Center, New York, N. Y. 10047.

The 3667 Scanner must be mechanically restrained in its final mounted position. During maintenance, the 3667 can be tipped forward by a downward force in the extended components drawer. The customer must provide this restraint. Unless the 3667 is restrained from tipping by the geometry of the checkstand, an IBM provided Safety Clip or Safety Bracket must be ordered for each 3667. It is the responsibility of the customer to locate and install the restraining hardware. (see Specify Item [4].)

Supplies: A window, IBM Part No. 5563123, will need to be ordered to replace the existing window periodically as it becomes excessively scratched. See M 10000 pages for ordering instructions.

For copies of the UPC Symbol Specification and the UPC Guidelines, write to:

Distribution Codes, Inc.
401 Wythe Street
Alexandria, Virginia 22314

For copies of the General Specifications for the Article Symbol Marking (EAN) write to:

Secrétaire General E. A. N.
Rue de la Chancellerie 14 - 1000, Bruxelles

Specify: [1] Cable Requirements: See the M 3663 pages.

[2] Packaging: If the machine is to be installed in N. Y. State, specify #9550 for additional labeling to meet current regulations. If the machine is to be installed in the State of Texas, specify #9551 for additional labeling to meet current regulations.

[3] Scan Direction: Specify #9604 for Normal Scan Direction. This is typically used for Over the Counter (OTC) operation, sometimes referred to as checker unload. Specify #9605 for Optional Scan Direction. This is typically used for Over the End (OTE) operation, sometimes referred to as customer unload. See IBM 3650 Programmable Store System Installation Manual - Physical Planning, GA27-3167, or IBM 3660 Supermarket Systems Installation Manual - Physical Planning, GA27-3079, for illustration of scan direction options.

[4] See 3660 System Installation Manual - Physical Planning, GA27-3079 to determine the type of restraining hardware desired. Order one of the following for each 3667 to be installed:



3667 Checkout Scanner (cont'd)

- 1) Safety Clip -- for each 3667 order one B/M 5194716 to secure one rear 3667 leg to the customers' stationary horizontal mounting surface, or
- 2) Safety Bracket - for each 3667 order one B/M 5194758 to secure the 3667 lower rear cabinet extension to the customers' stationary checkstand surface.

Order the Safety Clip or Safety Bracket
This is a no charge item to the customer

PRICES:	Mdl	ATP/ MLC 5 yr	Purchase*	MMMC
3667	1	\$ 147	\$3,560	\$37.50

Warranty: B Purchase Option: 55% Machine Group: D
 Useful Life Category: 2 Per Call: 1
 Termination Charge Months: 6 Termination Charge Percent: 20%
 Upper Limit Percent: 5%

IBM 3669 STORE COMMUNICATIONS UNIT

Purpose: To provide communications for the 3650 Programmable Store System and 3660 Supermarket System over common carrier network facilities between a 3651 Store Controller mdl A60, B60, A75, B75, C75 or D75 and:

- 1) The host S/370 or 4300 Processor via an IBM 3872 Modem or equivalent or IBM 2400 bps Integrated Modem of an IBM 3704 or 3705 Communications Controller with switched line features, or a Communications Adapter (#1601) feature on the 4331.
- 2) The store loops of another predesignated store location via another 3669 at that location, to provide backup operation for that store in case its 3651 Store Controller mdl A60, B60, A75, B75, C75 or D75 is inoperative.
- 3) The 3651 Store Controller mdl A60, B60, A75, B75, C75 or D75 in the predesignated store via the 3669 in that store for the purpose of data reconciliation when the backup operation is terminated. If both Store Controllers are 3650 mdl 75, communication can also be performed for purposes other than backup data reconciliation.

The 3669 is designed to operate at 2400 bps over a switched telephone network. This unit is equipped with an Automatic Answering facility but requires manual dialing. The connection to the telephone network is made through a CBS type data access arrangement which must be ordered from the telephone company.

Highlights: The 3669 is a stand-alone synchronous signal converter designed to connect either an IBM 3651 Store Controller mdl A60, B60, A75, B75, C75 or D75 or two store loops to the common carrier communications network. A switch provides the controls for connecting the 3669 to the 3651 mdl A60, B60, A75, B75, C75 or D75 controller or to the store loops. Diagnostic test functions are normally under control of the 3651 mdl A60, B60, A75, B75, C75 or D75 during initial power on. An additional switch setting allows the performance of a manual diagnostic test. Auto answer is included as a standard feature.

Attachment: One cable is provided to attach to a CBS Data Access Arrangement line. One cable is provided to interface to the store loop.

PREREQUISITES: [1] A 3650 Programmable Store System or a 3660 Supermarket System (equipped with an IBM 3651 Store Controller mdl A60, B60, A75, B75, C75 or D75) ... [2] A switched line communications facility with Type CBS Data Access Arrangement ... [3] A store loop equipped with at least one IBM 3663 Supermarket Terminal mdl 1 or mdl 1P ... [4] Communications with any virtual storage S/370 or 4300 processor (3033, 3033 MP, 3158 MP, 3168, 3168 MP VTAM only, 4331, 4341) (165 II BTAM only) via the 3704 or 3705 or an ICA (BTAM only) on a S/370 mdl 115, 125, 135, 135-3, or 138, or a Communications Adapter (#1601) feature on the 4331.

Customer Responsibilities: [1] See M 2700 pages of sales manual ... [2] Customer is responsible for obtaining, installing, and testing the store loops. See Installation Manual - Physical Planning (GA27-3079) for the 3660 Supermarket System.

Specify: Voltage (AC, 1-phase, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. For non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3669	1	\$ 137	\$ 117	\$ 4,770	\$27.50

Plan Offering: Plan B Warranty: B Machine Group: D
 Purchase Option: 55% Useful Life Category: 2 Per Call: 1
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%

* Pilot Test Plan applies: PTP Option Percent: 70%



IBM 3683 POINT OF SALE TERMINAL

Purpose: A user programmable input/output terminal for the IBM 3680 Programmable Store System which provides the point of sale transaction, data collection, credit authorization, price look-up and other inquiry and data entry functions. The self contained programmable segment allows the 3683 to continue most sales functions when disconnected from the 3684 Point of Sale - Control Unit, and after receiving a program load from the 3684.

Highlights: A modular input/output unit with features that provide for an integrated or distributed terminal. It features data entry by keyboard or from a Magnetic or OEM OCR Wand, and data output via an 8 digit numeric display; 32 indicators for operator guidance and machine status conditions; and printing of data under program control. The minimum configuration must include a base unit plus a Keyboard and a Display ... see "Prerequisites." The 3684 mdl 2 is capable of transmitting or receiving data with several 3683s over a 2400 bps loop.

Base Unit: Provides (1) the base electronic storage and intelligence and an audible alarm; and (2) a matrix printer with cash receipt station. Basic storage is 32K bytes. This can be increased to 56K bytes by Storage Increment features. An Audible Alarm, activated when predetermined events require operator attention or intervention for system operation, is also part of the base unit.

Printer: A matrix, bi-directional printer which prints a 38 character print line at 15 characters per 25.4mm (1 inch) spacing. Vertical line spacing is 6.3 lines per 25.4mm (1 inch) at a rate of 20 lines per second. It uses an easily replaceable cartridge ribbon. In addition to the standard character sets, an all-points addressable capability allows (by customer programming) printing of customer logo and special graphics. Additional print stations can be ordered as special features. The cash receipt station will accept 88.9mm (3-1/2 inch) diameter roll paper, 69.85mm (2-3/4 inches) wide.

PREREQUISITES: 1) A 3684 Point of Sale - Control Unit mdl 2 provides the control segment for the 3683. See 3684 Machines pages for details. 2) A Keyboard (#4921, #4922 or #4923) and a Display (#3331 or #3332) must be ordered for each 3683.

Customer Responsibilities: 1) See 3680 Programmable Store System in "Systems" for general description of customer responsibilities. 2) The following statement is to be included in proposals:

"It is agreed that IBM will have no responsibility to provide warranty or maintenance service on an IBM 3683 Point of Sale Terminal when cash is contained in the unit. It shall be the purchaser's (customer's) responsibility to remove, control, and replace cash so that IBM can fulfill its warranty and maintenance obligations.

The exception to the above shall be when a failure occurs in the cash drawer and it cannot be opened prior to CE maintenance. In those cases the customer shall assign one of his personnel to assume responsibility for removal of the cash once the drawer has opened."

Customer Set-Up: The 3683 will be shipped with customer set-up instructions. The customer is responsible for:

- unpacking, placement, set up and check out of the 3683 at time of delivery, or when relocating the 3683.
- relocation of the 3683 (if required) to allow IBM service access.
- using and following the 3683 Problem Determination Procedures.

Environment: See 3680 Programmable Store System in "Systems."

Maintenance: 3683s located in the immediate sales area may preclude the customer acceptability of online repair due to the public scrutiny and loss of the selling location for customer service. In these cases, the customer should remove the failing unit to a repair facility located within the store for subsequent repair. At this location the CE will repair and test the unit.

Supplies: [1] A black ribbon cartridge, IBM Part No. 7034640 or equivalent, is required. [2] Roll paper 88.9mm (3.5 inch) diameter, 69.85mm (2.75 inch) wide is required for the Cash Receipt and Journal print stations.

SPECIFY: [1] Voltage (120V AC, 1-phase, 3-wire, 60Hz); #9890 for locking plug, or #9891 for non-lock plug. If the standard 2.8 meter (9 foot) power cable is not desired, specify #9511 for 1.8 meter (6 foot) cable. NOTE: 120V is compatible with existing 115V systems.

PRICES:	Mdl	MLC 5 yr	Purchase	MMM/ AMMCR
3683	1	\$ 81	\$2,655**	\$10.50

Plan Offering: Plan D Purchase Option: 55% Maintenance: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 6 Termination Charge Percent: 20%
Initial Period of Maintenance Service: 3 months
Upper Limit Percent: 5%

SPECIAL FEATURES

KEYBOARDS. GENERAL: All keyboards have customer legendable keybuttons except for 11 keybuttons which have molded legends. All single and double function keys are under customer program control. Double keys may be moved, added, or deleted by the user. Several colors and sizes of decal sheets with common legends will be shipped with the 3683. See accessories section M10000 for released keybuttons that may be ordered for any unique customer requirement. **Maximum:** One Keyboard (#4921, #4922 or #4923). **Field Installation:** Yes.

35 KEY MODIFIABLE KEYBOARD (#4921): A 35 key keyboard that includes:

- 5 Legended system control keys.
- 19 Unlegended function keys.
- 11 Keys with dual legends on each keybutton, "numeric" and "transaction type", in the data entry arrangement.

48 KEY MODIFIABLE KEYBOARD (data entry) (#4922): A 48 key keyboard that includes:

- 5 Legended system control keys.
- 32 Unlegended function keys.
- 11 Keys with dual legends on each keybutton, "numeric" and "transaction type", in the data entry arrangement.

48 KEY MODIFIABLE KEYBOARD (adding machine) (#4923): A 48 key keyboard that includes:

- 5 Legended system control keys.
- 32 Unlegended function keys.
- 11 Keys with round numeric legended keybuttons in the adding machine arrangement.

DISTRIBUTED KEYBOARD ATTACHMENT (#3240). Provides for locating the keyboard up to 3.6 meters (12 feet) from the 3683 base. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Keyboard - #4921, #4922 or #4923.

DISPLAY-ONE SIDED (#3331). An operator display and guidance unit consisting of a 8-digit numeric display and 32 indicators for operator guidance and machine status. The display is used to display numeric input or output data such as item number, totals, amount due, etc. The 32 indicator lights point to labels that describe machine status or guidance. The unit will be shipped with the indicators labeled. However, the customer may relabel all but five indicators and, under customer program control, define their use. A legend sheet with a variety of legends will be shipped with each machine. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be ordered with Display-Two Sided (#3332).

DISPLAY-TWO SIDED (#3332). An operator and customer display guidance unit which contains all the functions of Display-One Sided (#3331) plus an 8-digit numeric display with 6 indicators on the back of the unit for customer viewing. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be ordered with Display-One Sided (#3331) or Display-Customer Remote (#3333).

DISPLAY-CUSTOMER REMOTE (#3333). A customer display and status indicator unit that is connected to the 3683 by a 3.6 meter (12 foot) cable. The unit consists of an 8-digit numeric display and 12 indicators (6 are shipped with labels and 6 without). All are relegendable. The display and indicators are under customer program control. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be ordered with Display-Two Sided (#3332). **Prerequisite:** Display-One Sided (#3331).

DISTRIBUTED DISPLAY ATTACHMENT (#3335). Provides for distributing Display-One Sided (#3331) or Display-Two Sided (#3332) up to 3.6 meters (12 feet) from the 3683 base. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Display-One Sided (#3331) or Display-Two Sided (#3332).

CASH DRAWER-INTEGRATED-FIRST (#1571). Provides a cash drawer with housing and removable till that is integrated with the 3683 base unit. The cash drawer has a media slot that will accommodate approximately a 25mm (1 inch) stack of documents. Opening the cash drawer is under program control. A cash drawer lock is provided. See note below for special ordering instructions for lock and removable bill dividers. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Only one additional cash drawer may be ordered -- either Cash Drawer-Integrated-Second (#1573), Cash Drawer-Distributed (#1575), or OEM Cash Drawer Attachment (#1577).

** Pilot Test Plan available. Purchase Pilot Option: 70%



3683 Point of Sale Terminal (cont'd)

CASH DRAWER-INTEGRATED-SECOND (#1573). Provides a second integrated cash drawer with housing and removable till and is installed directly below Cash Drawer-Integrated-First (#1571). Functionally equivalent to Cash Drawer-Integrated-First (#1571). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Cash Drawer-Integrated-First (#1571).

CASH DRAWER-DISTRIBUTED (#1575). Provides a distributed cash drawer with housing and removable till that can be located up to 3.6 meters (12 feet) from the 3683 base. Functionally equivalent to Cash Drawer-Integrated-First (#1571). **Maximum:** Two if no other cash drawer is ordered. One if Cash Drawer-Integrated-First (#1571) or OEM Cash Drawer Attachment (#1577) is ordered. **Field Installation:** Yes.

OEM CASH DRAWER ATTACHMENT (#1577). Provides an IBM defined interface with cable and plug for attaching an OEM Cash Drawer. **Maximum:** Two if no IBM Cash Drawer is ordered. One if a Cash Drawer-Distributed-First (#1571) or Cash Drawer-Distributed (#1575) is ordered. **Field Installation:** Yes. **Limitation:** An attached OEM Cash Drawer must meet the IBM defined interface.

Notes:

- 1) For cash drawer tills and covers, see M10000 pages.
- 2) Specify #9799 for each IBM cash drawer ordered (#1571, #1573 or #1575) if a till with movable bill dividers is desired.
- 3) Cash Drawer Lock: Each IBM cash drawer (#1571, #1573 or #1575) is equipped with a lock. A group of 25 unique lock numbers has been reserved to allow a customer to specify identical lock types on all terminals. This allows all cash drawers to be opened with the same key. If this is desired, specify one of the following features on the cash drawer order:

#9101	#9106	#9111	#9116	#9121
9102	9107	9112	9117	9122
9103	9108	9113	9118	9123
9104	9109	9114	9119	9124
9105	9110	9115	9120	9125

If none is specified, a lock will be selected at random from a larger group of lock types. Each cash drawer will be shipped with two cash drawer keys.

JOURNAL PRINTER (#4695). Provides a journal print station with a journal roll take-up mechanism. Print line length is 38 characters at 15 characters per 25.4mm (1 inch) spacing. Vertical line spacing is 6.3 lines per 25.4mm (1 inch) at a rate of 20 lines per second. The all-points addressable characteristics of the printer permit the customer to highlight exceptions through special graphics designed and controlled by user programming. A 12.7mm (1/2") signature window is provided. The journal station will accept 88.9mm (3-1/2") diameter roll paper, 69.85mm (2-3/4") wide. **Maximum:** One. **Field Installation:** Yes.

JOURNAL LOCK (#4690). Provides a special lock and security cover over the printed journal. See Note below for special lock selections. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Journal Printer (#4695).

MANAGER KEYLOCK (#4905). Provides a keylock mounted on the keyboard that allows customer programming to interrogate the position of the keylock when the key is operated. Possible uses include the enforcement of a manager override to a restricted security function. See Note below for special lock selection. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Keyboard - #4921, #4922, or #4923.

Note: Two groups of 10 unique specify numbers have been reserved to allow a customer to order a specific journal lock or manager keylock for each terminal. (The 3683 and 3684 use the same journal lock numbers, therefore all terminals within a store could have the same lock if desired.) If the same lock is desired on the journal and manager keylock specify the respective locks with the same value in the last digit. That is, if #9203 and #9303 are specified, the same lock (#9203) will be installed at both locations.

Journal Lock		Manager Keylock	
#9201	#9206	#9301	#9306
9202	9207	9302	9307
9203	9208	9303	9308
9204	9209	9304	9309
9205	9210	9305	9310

If none is specified, a lock will be selected at random from a larger group of lock types. Each lock feature will be shipped with two keys. For additional or replacement keys, refer to M10000 pages.

VALIDATION PRINTER (#8725). Provides a flat bed document validation station for printing on inserted forms. Prints 38 characters per line at 15 characters per 25.4mm (1 inch). Vertical line spacing is 6.3 lines per 25.4mm (1 inch) at a rate of 20 lines per second. The all-points addressable characteristics of the printer allow logos, special graphics and highlighting to be designed and printed by user programming. **Maximum:** One. **Field Installation:** Yes.

STORAGE INCREMENTS:

NOTE: When storage is upgraded by field installation, the new Storage Increment feature displaces the old. Removed parts belong to the customer.

STORAGE INCREMENT-8K (#7710). Provides an additional 8,192 bytes of storage. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Storage Increment-16K (#7720) or Storage Increment-24K (#7730).

STORAGE INCREMENT-16K (#7720). Provides an additional 16,384 bytes of storage. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Storage Increment-8K (#7710) or 24K (#7730). **Note:** If Storage Increment-8K (#7710) is installed, it must be removed to install this feature.

STORAGE INCREMENT-24K (#7730). Provides an additional 24,576 bytes of storage. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Storage Increment-8K (#7710) or 16K (#7720). **Note:** If storage Increment-8 (#7710) or 16K (#7720) is installed, it must be removed to install this feature.

TOTALS RETENTION (#8010). Provides an additional 240 bytes of customer programmable storage that is powered by its own battery to protect loss of information such as totals, transaction number, terminal address, etc. When power is turned off or power interruptions occur, an early warning status condition will be given to the program when the battery needs replacing. Replacement batteries are to be provided, installed, and removed by the customer. IBM will replace the battery if requested by the customer on a time and material basis. (See M10000 pages for battery life characteristics and types of batteries required for replacement.) **Maximum:** One. **Field Installation:** Yes.

STORAGE RETENTION (#7785). Provides an internal battery and charger to power storage during a power interruption. All data and programs are protected so that a transaction in process when power was interrupted will continue when primary power is restored. The duration of storage retention depends on the charged state of the battery. When fully charged, storage will be retained for approximately 12 minutes. The number of times the battery is discharged greatly affects battery life, therefore facilities are provided to allow the customer, through programming, to deactivate the battery for scheduled power off conditions such as store closing. Replacement batteries are to be provided, installed, and removed by the customer. IBM will replace the battery if requested by the customer on a time and material basis. Replacement batteries may be ordered through IBM (see M10000 pages) or through other sources that meet the supply battery specifications as defined by IBM. **Maximum:** One. **Field Installation:** Yes.

EXPANSION FEATURE (#3880). Provides facilities to accommodate additional features that cannot be installed on the base unit. This feature is a prerequisite to install any of the following:
-- IML Read Adapter (#4633)
-- Magnetic Wand Reader (#4945)
-- OCR Wand Adapter (#5422)
Maximum: One. **Field Installation:** Yes.

IML READ ADAPTER (#4633). Provides a means to initialize 3683 terminals when a 3684 mdl 2 is unavailable or unable to provide the IML (Initial Machine Load). An adapter is provided for attaching an external user provided tape cassette recorder and reading data previously recorded at a 3684 mdl 2 with the IML-Write Adapter (#4634). (Refer to "IBM 3680 Programmable Store System Introduction Manual", [SRL No. to be furnished at a later date] for cassette recorder interface requirement.) **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Expansion Feature (#3880).

MAGNETIC WAND READER (#4945). A hand operated wand used to read single track delta distance encoded magnetic merchandise tickets, credit cards, employee badges, etc. The small light-weight wand attached via a 1.2 meter (4 foot) long flexible cord, allows encoded merchandise tickets to be read without removing them from the merchandise. See Note below. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with OCR Wand Adapter (#5422). **Prerequisite:** Expansion Feature (#3880).

NOTE -- The minimum encoding specifications that must be met by suppliers of credit cards, merchandise tickets and employee badges will be furnished upon request.

OCR WAND ADAPTER (#5422). Provides an adapter to support the attachment of an OEM OCR Wand (Recognition Products, Inc., OCR Wand or equivalent that meets the OCR Wand Interface

3683 Point of Sale Terminal (cont'd)

Specifications dated 10/17/75 to the 3653 Point of Sale Terminal). This feature provides a 1.83 meter (6 foot) cable with an ITT-Cannon DBC-25S type connector to attach the OEM OCR Wand unit. **Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with Magnetic Wand Reader (#4945). Prerequisite: Expansion Feature (#3880).**

Special Feature Prices:	MLC 5 yr	Purchase	AMMCR/ MMMC
35 Key-modifiable Keybd #4921	\$ 6	\$ 150	\$ 1.50
48 Key-modifiable Keybd 4922	6	165	1.50
48 Key-modifiable Keybd 4923	6	165	1.50
Dist Keyboard Attach 3240	1	30	-
Display-One Sided 3331	7	200	2.00
Display-Two Sided 3332	13	360	3.00
Display-Customer Remote 3333	8	240	1.50
Dist Display Attach 3335	1	15	-
Cash Drawer-Int-First 1571	7	220	1.00
Cash Drawer-Int-Second 1573	7	230	1.00
Cash Drawer-Distributed 1575	7	230	1.00
OEM Cash Drawer Attach 1577	1	30	.50
Journal Printer 4695	4	100	1.00
Journal Lock 4690	1	30	-
Manager Keylock 4905	1	30	-
Validation Printer 8725	6	170	1.00
Storage Increment-8K 7710	3	113	.50
Storage Increment-16K 7720	6	225	.50
Storage Increment-24K 7730	9	338	.50
Totals Retention 8010	5	130	1.00
Storage Retention 7785	6	175	1.00
Expansion Feature 3880	1	20	.50
IML Read Adapter 4633	6	175	1.00
Magnetic Wand Reader 4945	14	391	3.00
OCR Wand Adapter 5422	5	185	.50

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**IBM 3684 POINT OF SALE - CONTROL UNIT**

Purpose: A user programmable input/output, data collection and processing terminal with a 985,088 byte integrated diskette for the IBM 3680 Programmable Store System.

Model 1 Single unit

Model 2 Master unit

The 3684 mdl 1 is designed for single terminal stores. It contains a single programmable segment with appropriate features to allow the user to perform the point of sale, data collection, credit authorization, price look-up, inquiry, data entry and host communication functions. The point of sale features and functions are similar to the 3683 Point of Sale Terminal.

The 3684 mdl 2 is designed to perform the point of sale function and to act as a master control in multiple terminal stores. There are two self contained programmable segments, one to perform the point of sale function similar to the 3683, and the second to perform the control function for communication with its own point of sale segment and with additional loop-attached 3683 terminals. In addition, the control segment controls the diskette and host communication input/output functions.

Highlights: A modular input/output unit with features that provide for an integrated or a limited distributed (cash drawer and display) package. It features data entry by keyboard or from a Magnetic or OEM OCR Wand, data output by an 8 digit numeric display; 32 indicators for operator guidance and machine status conditions, and printing of input or output data under program control. It features a cash drawer with removable till and adjustable divider option. An integrated diskette is used for customer program storage, data and table storage, diagnostic programs and error logging. The minimum configuration must include a base unit plus a keyboard and a display. (See Prerequisites.)

Base Unit: Consists of [1] programmable segments and storage (Model 1 has 56K; Model 2 has 32K for the point of sale segment and 56K for the control segment); [2] a matrix printer with a cash receipt station; and [3] a 985,088 byte diskette drive. An Audible Alarm, activated when predetermined events require operator attention or intervention for system operation, is also part of the base unit.

Printer: A matrix, bi-directional printer which prints a 38 character print line at 15 characters per 25.4mm (1 inch) spacing. Vertical line spacing is 6.3 lines per 25.4mm (1 inch) at a rate of 20 lines per second. It uses an easily replaceable cartridge ribbon. In addition to the standard character sets, an all-points addressable capability allows (by customer programming) printing of logos and special graphics. Additional print stations can be ordered by special feature. The cash receipt station will accept 88.9mm (3-1/2") diameter roll paper, 69.85mm (2-3/4") wide.

Diskette: A 985,088 byte Diskette 2D is used on both models. The diskettes are formatted to 256 byte blocks. The diskette is removable and interchangeable.

Communications: All 3684 models have BSC or SDLC communication capability. Depending on customer selection at system generation, either or both protocols may reside in the terminal and either may become active when loaded from the diskette.

System Attachment: The 3684 mdls 1 and 2 attach to any virtual storage S/370 or 4341 Processor via a 3704 or 3705 Communications Controller in 2701, 2703 Emulation Mode (or Integrated Communications Adapter) for BSC systems and in NCP/VS mode for SDLC systems. Attachment is over communication lines at speeds of 1200, 2400 or 4800 bps.

Communications Facilities: The 3684 operates in data half-duplex point-to-point or multipoint mode on half-duplex or duplex facilities at transmission speeds of 1200/600, 2400/1200, 4800/2400 bps on nonswitched facilities. In addition, the 3684 also operates in half-duplex point-to-point mode at transmission speeds of 1200/600, 2400/1200 and 4800/2400 bps on switched facilities. See M 2700 pages.

Modems: A 1200 bps Integrated Modem (#5530) feature or an external modem may be attached to a 3684. External modems require the External Modem Interface (#3701) feature.

IBM Modems	Speed (bps)
3872 model 1	2400/1200
3874 model 1	4800/2400

Switched network backup operation with Manual Call and Manual or Auto Answer is not available. For communications capabilities, product utilization and special features, see M 2700, M 3872 and M 3874 pages.

In Store Communications: The 3684 mdl 2 performs a master control function for 3683s that are attached to the 3684 by a 2400 bps loop. Interactive communication capability exists be-

tween the 3684 and 3683s for data collection, price look-up, credit, and diagnostic facilities.

All models of the 3684 receive their initial machine load (IML) from a S/370 or 4341 host processor either by physical diskette transport or by teleprocessing. The 3684 IML and the IML's for 3683s associated with a 3684 mdl 2 are maintained on the diskette. The 3684 mdl 2 transmits the 3683 IML when requested by the 3683.

PREREQUISITES: [1] A 3704 or 3705 in 2701, 2703 Emulation Mode (or Integrated Communications Adapter) for BSC systems and in NCP/VS Mode for SDLC systems (with appropriate features ... see M 3704 and 3705 pages) attached to any virtual storage S/370 or 4341 Processor ... [2] A keyboard (#4921, #4922 or #4923) and a display (#3331 or #3332) must be ordered for each 3684 ... see "Special Features."

Customer Responsibilities: 1) See 3680 Programmable Store System in "Systems" for general description of customer responsibilities. 2) The following statement is to be included in proposals:

"It is agreed that IBM will have no responsibility to provide warranty for maintenance service on an IBM 3684 Point of Sale - Control Unit when cash is contained in the unit. It shall be the purchaser's (customer's) responsibility to remove, control, and replace cash so that IBM can fulfill its warranty and maintenance obligations.

The exception to the above shall be when a failure occurs in the cash drawer and it cannot be opened prior to CE maintenance. In those cases the customer shall assign personnel to assume responsibility for removal of the cash once the drawer has opened."

Customer Set-Up: The 3684 will be shipped with customer set-up instructions. The customer is responsible for:

- Unpacking, placement, set up and check out of the 3684 at time of delivery, or when relocating the 3684.
- Relocation of the 3684 (if required) to allow IBM service access.
- Using and following the Problem Determination Procedures.
- Physical set up and connection of cables to TP lines/modems.

Environment: See 3680 Programmable Store System in "Systems."

Maintenance: 3684s located in the immediate sales area may preclude the acceptability of repair due to the public scrutiny and loss of the selling location for customer service. In these cases, the customer should remove the unit to a repair facility located within the store for subsequent repair. At this location the CE will repair and test the unit.

Supplies: [1] A black ribbon cartridge, IBM Part No. 7034640 or equivalent, is required ... [2] Diskette 2D, IBM Part No. 1766872 or equivalent, formatted with 256 byte blocks is required for 3684 mdls 1 and 2 ... [3] Roll paper 88.9mm (3.5 inch) diameter, 69.85mm (2.75 inch) wide is required for the Cash Receipt and Journal Print stations.

SPECIFY:

[1] Voltage (120V AC, 1-phase, 3-wire, 60Hz): **#9890** for locking plug, or **#9891** for non-lock plug. If standard 2.8 meter (9 foot) power cable is not desired, specify **#9511** for 1.8 meter (6 foot) cable. NOTE: 120V AC is compatible with existing 115V systems.

[2] Controller Designation: Specify **#9491** on the first 3684 to be used with a host system location and specify **#9492** on each additional 3684 in the network.

When **#9491** is specified, additional information must be specified as follows:

1) Specify one of the following to indicate magnetic tape density (media) used at the host system location. This tape media is available under DOS/VS and OS/VS2 only.

- #9412** -- 9 track 800 bps
- #9413** -- 9 track 1600 bps
- #9414** -- 9 track 6250 bps

If magnetic tape is not used at the host system specify one of the following media which is available under DOS/VS only:

- #9421** -- 2316 Disk Pack
- #9422** -- 3336 Disk Pack mdl 1
- #9423** -- 3336 Disk Pack mdl II
- #9424** -- 3348 Data Module

The 3684 controller data will be sent via the specified media to the IBM Programming Systems Representative at the host system location for installation. If disk media is required, the IBM disk will be returned to the plant location after installation of the controller data.



3684 Point of Sale - Control Unit (cont'd)

[4] Store Loop Polarity Tester: Order Store Loop Polarity Tester, Part No. 1859559, One is furnished at no charge to each 3684 mdl 2 site for testing store loop wiring.

PRICES:	mdl	MLC 5 yr	Purchase	MMMC/ AMMCR
3684	1	\$127	\$3,450**	\$33.00
	2	154	4,300**	37.50

Plan Offering: Plan D Purchase Option: 55% Maintenance: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 6 Termination Charge Percent: 20%
Initial Period of Maintenance Service: 3 months
Upper Limit Percent: 5%

Model Changes: Model changes are field installable. The parts removed for a model change become the property of IBM.

MODEL UPGRADE PURCHASE PRICE: (there are no additional installation charges)

From Model 1 to Model 2 \$850

SPECIAL FEATURES

KEYBOARDS, GENERAL: All keyboards have customer legenda- ble keybuttons except for 11 keybuttons which have molded legends. All single and double function keys are under customer program control. Double keys may be moved, added, or deleted by the user. Several colors and sizes of decal sheets with common legends will be shipped with the 3684. See accessories section M10000 for released keybuttons that may be ordered for any unique customer requirement. **Maximum:** One keyboard (#4921, #4922 or #4923). **Field Installation:** Yes.

35 KEY-MODIFIABLE KEYBOARD (#4921): A 35 key keyboard that includes:

- 5 Legended system control keys.
- 19 Unlegended function keys.
- 11 Keys with dual legends on each keybutton, "numeric" and "transaction type", in the data entry arrangement.

48 KEY-MODIFIABLE KEYBOARD (Data Entry) (#4922): A 48 key keyboard that includes:

- 5 Legended system control keys.
- 32 Unlegended function keys.
- 11 Keys with dual legends on each keybutton, "numeric" and "transaction type", in the data entry arrangement.

48 KEY-MODIFIABLE KEYBOARD (Adding Machine) (#4923): A 48 key keyboard that includes:

- 5 Legended system control keys.
- 32 Unlegended function keys.
- 11 Keys with round numeric legended keybuttons in the adding machine arrangement.

DISPLAY-ONE SIDED (#3331). An operator display and guidance unit consisting of an 8-digit numeric display and 32 indicators for operator guidance and machine status. The display is used to display numeric input or output data such as item number, credit number, totals, amount due, etc. The 32 indicator lights point to labels that describe: (1) Machine status such as: Ready, Wait, Offline, etc., (2) step by step guidance to lead the operator through a transaction or procedure. The unit will be shipped with the indicators labeled. However, the customer may relabel all but five indicators and, under customer program control, define their use. A legend sheet with a variety of legends will be shipped with each machine. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be ordered with Display-Two Sided (#3332).

DISPLAY-TWO SIDED (#3332). An operator and customer display guidance unit which contains all the functions of Display-One Sided (#3331) plus an 8-digit numeric display with 6 indicators on the back of the unit for customer viewing. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be ordered with Display-One Sided (#3331) or Display-Customer Remote (#3333).

DISPLAY-CUSTOMER REMOTE (#3333). A customer display and status indicator unit that is connected to the 3684 by a 3.6 meter (12 foot) cable. The unit consists of an 8-digit numeric display and 12 indicators (6 are shipped with labels and 6 without). All are relegendable. The display and indicators are under customer

program control. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be ordered with Display-Two Sided (#3332). **Prerequisite:** Display-One Sided (#3331).

DISTRIBUTED DISPLAY ATTACHMENT (#3335). Provides for distributing Display-One Sided (#3331) or Display-Two Sided (#3332) up to 3.6 meters (12 feet) from the 3684 base. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Display-One Sided (#3331) or Display-Two Sided (#3332).

CASH DRAWER-INTEGRATED FIRST (#1572). Provides a cash drawer with removable till that is contained within the 3684 base unit. The cash drawer has a media slot that will accommodate approximately a 25mm (1 inch) stack of documents. Opening the cash drawer is under program control. A cash drawer lock is provided. See note below for special ordering instructions for lock. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Only one additional cash drawer may be ordered -- either Cash Drawer-Integrated Second (#1573), Cash Drawer-Distributed (#1575), or OEM Cash Drawer Attachment (#1577).

CASH DRAWER-INTEGRATED SECOND (#1573). Provides a second integrated cash drawer with housing and removable till that is installed directly below Cash Drawer-Integrated First (#1572). Functionally equivalent to Cash Drawer-Integrated First (#1572). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Cash Drawer-Integrated First (#1572).

CASH DRAWER-DISTRIBUTED (#1575). Provides a distributed cash drawer with housing and removable till that can be located up to 3.6 meters (12 feet) from the 3684 base. Functionally equivalent to Cash Drawer-Integrated First (#1572). **Maximum:** Two if no other cash drawer is ordered. One if Cash Drawer-Integrated First (#1572) or OEM Cash Drawer Attachment (#1577) is ordered. **Field Installation:** Yes.

OEM CASH DRAWER ATTACHMENT (#1577). Provides an IBM defined interface with cable and plug for attaching an OEM Cash Drawer. **Maximum:** Two if no IBM Cash Drawer is installed. One if a Cash Drawer-Distributed First (#1572) or Cash Drawer-Distributed (#1575) is ordered. **Field Installation:** Yes. **Limitation:** An attached OEM Cash Drawer must meet the IBM defined interface.

Notes:

- 1) For cash drawer tills and covers, see M10000 pages.
- 2) Specify #9799 for each IBM cash drawer ordered (#1572, #1573 or #1575) if a till with movable bill dividers is desired.
- 3) Cash Drawer Lock: Each IBM cash drawer (#1572, #1573 or #1575) is equipped with a lock. A group of 25 unique lock numbers has been reserved to allow the customer to specify identical lock types on all terminals. This allows all cash drawers to be opened with the same key. If this is desired, specify one of the following features on the cash drawer order:

#9101	#9106	#9111	#9116	#9121
9102	9107	9112	9117	9122
9103	9108	9113	9118	9123
9104	9109	9114	9119	9124
9105	9110	9115	9120	9125

If none is specified, a lock will be selected at random from a larger group of lock types. Each cash drawer will be shipped with two cash drawer keys.

JOURNAL PRINTER (#4695). Provides a journal print station with a journal roll take-up mechanism. Print line length is 38 characters at 15 characters per 25.4mm (1 inch) spacing. Vertical line spacing 6.3 lines per 25.4mm (1 inch) at a rate of 20 lines per second. The all-points addressable characteristics of the printer permit the customer to highlight exceptions through special graphics designed and controlled by user programming. A 12.7mm (1/2") signature window is provided. The journal station will accept 88.9mm (3-1/2") diameter roll paper, 69.85mm (2-3/4") wide. **Maximum:** One. **Field Installation:** Yes.

JOURNAL LOCK (#4690). Provides a special lock and security cover over the printed journal. (See note below for special lock selection.) **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Journal Printer (#4695).

MANAGER KEYLOCK (#4905). Provides a keylock mounted on the keyboard that allows customer programming to interrogate the position of the keylock when the key is operated. Possible uses include the enforcement of a manager override to a restricted security function. (See Note below for special lock selection.) **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Keyboard - #4921, #4922, or #4923.

DISKETTE COVER LOCK (#3310). Provides a lock for the diskette cover. (See note below for special lock selection.) **Maximum:** One. **Field Installation:** Yes.

NOTE: Three groups of 10 unique specify numbers have been reserved to allow a customer to order a specific journal lock,

** Pilot Test Plan available. Purchase Pilot Option: 70%.

**3684 Point of Sale - Control Unit** (cont'd)

manager keylock or diskette cover lock for each terminal. (The 3683 and 3684 use the same journal lock and manager lock numbers, therefore all terminals within a store could have the same lock if desired.) If the same lock is desired on the journal, manager keylock and diskette cover, specify the respective locks with the same value in the last digit. That is, if #9203, #9303 and #9213 are specified, the same lock (#9203) will be installed at all locations.

Journal Lock		Manager Keylock		Diskette Cover Lock	
#9201	#9206	#9301	#9306	#9211	#9216
9202	9207	9302	9307	9212	9217
9203	9208	9303	9308	9213	9218
9204	9209	9304	9309	9214	9219
9205	9210	9305	9310	9215	9220

If none is specified, a lock will be selected at random from a larger group of lock types. Each lock feature will be shipped with two keys. For additional or replacement keys, refer to M10000 pages.

VALIDATION PRINTER (#8725). Provides for a flat bed document validation station for printing on inserted forms. Prints 38 characters per line at 15 characters per 25.4mm (1 inch). Vertical line spacing is 6.3 lines per 25.4mm (1 inch) at a rate of 20 lines per second. The all-points addressable characteristics of the printer allow logos, special graphics and highlighting to be designed and printed by user programming. **Maximum:** One. **Field Installation:** Yes.

STORAGE INCREMENTS:

NOTES: 1) Storage increments apply to the point-of-sale segment of the 3684 (mdl 2 only) ... 2) When storage is upgraded by field installation, the new Storage Increment feature displaces the old. Removed parts belong to the customer.

STORAGE INCREMENT - 8K (#7710). Provides an additional 8,192 bytes of storage. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Storage Increment - 16K (#7720) or Storage Increment - 24K (#7730).

STORAGE INCREMENT - 16K (#7720). Provides an additional 16,384 bytes of storage. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Storage Increment - 8K (#7710) or Storage Increment - 24K (#7730).

STORAGE INCREMENT - 24K (#7730). Provides an additional 24,576 bytes of storage. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Storage Increment - 8K (#7710) or Storage Increment - 16K (#7720).

TOTALS RETENTION (#8010). Provides an additional 240 bytes of customer programmable storage that is powered by its own battery to protect loss of information such as totals, transaction number, terminal address, etc., when power is turned off or power interruptions occur. An early warning status condition will be given to the program when the battery needs replacing. Replacement batteries are to be provided, installed, and removed by the customer. IBM will replace the battery if requested by the customer on a time and material basis. See M10000 pages for battery life characteristics and types of batteries required for replacement. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Applies to the 3684 mdl 1 and to the point of sale segment of the 3684 mdl 2.

STORAGE RETENTION (#7785). Provides an internal battery and charger to power storage during a power interruption. All data and programs are protected so that a transaction in process when power was interrupted will continue when primary power is restored. The duration of storage retention depends on the charged state of the battery. When fully charged, storage will be retained for approximately 12 minutes for a model 1 and approximately 6 minutes for a model 2. The number of times the battery is discharged greatly affects battery life, therefore facilities are provided to allow the customer, through programming, to deactivate the battery for scheduled power off conditions such as store closing. Replacement batteries are to be provided, installed, and removed by the customer. IBM will replace the battery if requested by the customer on a time and material basis. Replacement batteries may be ordered through IBM (see M10000 pages) or through other sources that meet the battery specifications as defined by IBM. **Maximum:** One. **Field Installation:** Yes.

IML-WRITE ADAPTER (#4634). [Mdl 2 only] Provides the 3684 mdl 2 with the ability to write an IML (Initial Machine Load) tape on a user provided tape cassette recorder (refer to IBM 3680 Programmable Store System Introduction Manual, [SRL number to be provided] for Cassette Recorder interface requirement), which can be read by a 3683 Point of Sale Terminal equipped with an IML-Read Adapter (#4633) feature. **Maximum:** One. **Field Installation:** Yes.

EXPANSION FEATURE (#3890). [Mdl 1 only] Provides additional facilities on the 3684 mdl 1 to accommodate features that cannot be installed on the base unit. This feature is a prerequisite to install the Magnetic Wand Reader (#4945) or the OCR Wand

Adapter (#5422). **Maximum:** One. **Field Installation:** Yes.

Note: No Expansion Feature is required on the 3684 mdl 2 to install any applicable features.

MAGNETIC WAND READER (#4945). A hand operated wand used to read single track delta distance encoded magnetic merchandise tickets, credit cards, employee badges, etc. The small light-weight wand attached via a 1.2 meter (4 foot) long flexible cord, allows encoded merchandise tickets to be read without removing them from the merchandise. See Note below. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with OCR Wand Adapter (#5422). **Prerequisite:** Expansion Feature (#3890) must be installed on the 3684 mdl 1.

Note -- The minimum encoding specifications that must be met by suppliers of credit cards, merchandise tickets and employee badges will be furnished upon request.

OCR WAND ADAPTER (#5422). Provides an adapter to support the attachment of an OEM OCR Wand (Recognition Products, Inc., OCR Wand or equivalent that meets the OCR Wand Interface Specifications dated 10/17/75 to the 3653 Point of Sale Terminal). This feature provides a 1.83 meter (6 foot) cable with an ITT-Cannon BDBC-25S type connector to attach the OEM OCR Wand unit. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Magnetic Wand Reader (#4945). **Prerequisite:** Expansion Feature (#3890) must be installed on 3684 mdl 1.

TELECOMMUNICATION FEATURES

A 3684 may be equipped with either the External Modem Interface or the 1200 bps Integrated Modem feature.

Note: A 6.1 meter (20 foot) communication cable is provided for attachment to a stand-alone modem or to communications facility when an integrated modem is used. If a standard 6.1 meter communication cable is not desired, specify: #9061 for 3.0 meter (10 foot) cable, #9062 for 9.1 meter (30 foot) cable, or #9063 for 12.2 meter (40 foot) cable.

1200 BPS INTEGRATED MODEM (#5530). Provides an integrated modem for operation over switched or nonswitched communication facilities at 1200 bps. Auto answer is provided when operating over switched network. No external modem is required. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with External Modem Interface (#3701). **Specify:** Specify the following when ordering this modem:

Specify One: #9481 for Switched Network
#9482 for Nonswitched Network

If #9482 Nonswitched Network is specified, also specify one:
#9651 for 4 wire facility
#9652 for 2 wire facility

Note: If Switched Network (#9481) is specified, a data access arrangement type CBS, or FCC registered equivalent is required.

EXTERNAL MODEM INTERFACE (#3701). Provides an EIA interface for attachment of an IBM or other external modem. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be ordered with 1200 bps Integrated Modem (#5530). **Specify:** Specify the following as applicable:

- [1] Specify #9695 if the 3684 is required to provide clocking.
- [2] Specify one of the following transmission speeds:
 - #9820 for 1200 bps.
 - #9822 for 2400 bps.
 - #9823 for 4800 bps.

NOTE: Half speeds are derived through programming.

- [3] Specify #9126 if the IBM 3872 or 3874 Modem is ordered.



3684 Point of Sale - Control Unit (cont'd)

Special Feature Prices:	MLC 5 yr	Purchase	MMMC/ AMMCR
35 Key-modifiable Keybd #4921	\$ 6	\$ 150	\$ 1.50
48 Key-modifiable Keybd 4922	6	165	1.50
48 Key-modifiable Keybd 4923	6	165	1.50
Display-One Sided 3331	7	200	2.00
Display-Two Sided 3332	13	360	3.00
Display-Customer Remote 3333	8	240	1.50
Dist Display Attach 3335	1	15	-
Cash Drawer-Int-First 1572	5	150	1.00
Cash Drawer-Int-Second 1573	7	230	1.00
Cah Drawer-Distributed 1575	7	230	1.00
OEM Cash Drawer Attach 1577	1	30	.50
Journal Printer 4695	4	100	1.00
Journal Lock 4690	1	30	-
Manager Keylock 4905	1	30	-
Diskette Cover Lock 3310	1	30	-
Validation Printer 8725	6	170	1.00
Storage Increment-8K 7710	3	113	.50
Storage Increment-16K 7720	6	225	.50
Storage Increment-24K 7730	9	338	.50
Totals Retention 8010	5	130	1.00
Storage Retention 7785	6	175	1.00
IML-Write Adapter 4634	6	175	1.00
Expansion Feature 3890	3	75	.50
Magnetic Wand Reader 4945	14	391	3.00
OCR Wand Adapter 5422	5	185	.50
1200 bps Int Modem 5530	15	480	2.50
External Modem Interface 3701	10	360	.50



IBM 3704 COMMUNICATIONS CONTROLLER

Purpose: The 3704 attaches to any S/370 or 4300 Processor or, in 2701/2702/2703 Emulation Mode only, to S/360 mdl 30 (submodels E or F), 40, 50, 65, 67 (in 65 mode), 75 and 195 for communication with local or remote I/O devices over various common carrier provided or customer owned communication facilities. **NOTE:** See "Programming" and "SCP" sales manual pages for attachment capability.

Models: The 3704 is available in four models each of which allows attachment of up to 32 communication lines.

Model	Storage (bytes)
A1	16K
A2	32K
A3	48K
A4	64K

Highlights: A modular, programmable unit which greatly expands the communications capabilities of S/360, S/370 and 4300 systems. By virtue of its modularity and programmability, the 3704 boasts a high degree of flexibility in tailoring to a teleprocessing system's requirements. Also, it can relieve the CPU of many TP functions, including, but not limited to, line control, polling, addressing, code translation and error recovery.

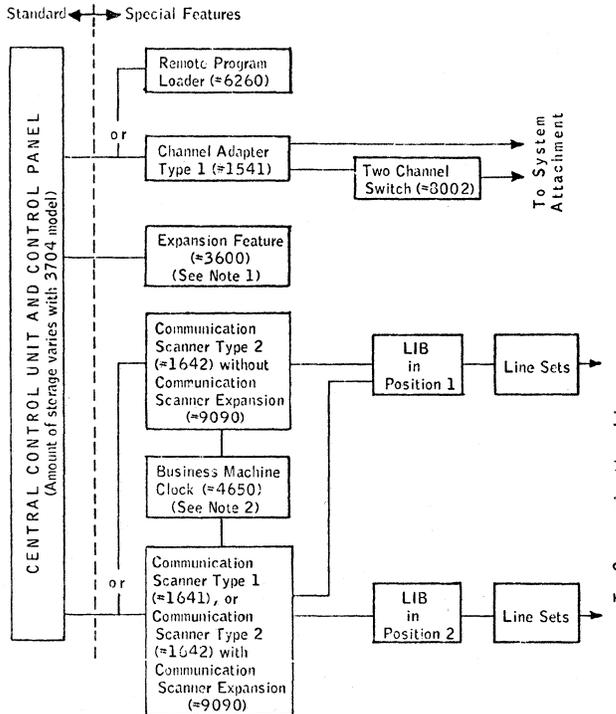
The 3704 is housed in a 36" x 24" x 57" cabinet which contains the Central Control Unit and the Control Panel. This cabinet also accommodates storage as indicated above, a Remote Program Loader or Channel Adapter, a Communication Scanner, Line Interface Bases and Line Sets to allow attachment of up to 32 communication lines.

The maximum number of communication lines attachable is a function of the speed of the lines, whether a Channel Adapter or Remote Program Loader is installed, the type of Communication Scanner installed, and the mode of operation.

The HONE Configurator is available to assist in configuring a 3704 to a specific TP network's requirements ... see "Specify."

Communication Facilities: The 3704 operates over common carrier provided or equivalent customer owned communication facilities. For information concerning these facilities, see the M 2700 pages, this section. The alphameric designations in the following pages correspond to those in the M2700 pages.

MACHINE ORGANIZATION



- NOTES: 1) Required for models A2, A3 and A4, or Communication Scanner Type 2 (#1642) on model A1.
2) A minimum of one Business Machine Clock (#4650) is required. See Special Features.

Terminal Devices: The 3704 can communicate with the following terminals over the communication facilities and at the speeds indicated ... for further information on features required, see "Special Features" on the following pages.

3704 LOCAL ATTACHMENT (START/STOP)

In addition to terminals being attached to the 3704 through common carrier facilities, they may also be connected directly to the 3704 units using #4713. Below are the attachable terminals and the respective feature #s. Cable groups may be traced via this feature # listing and the feature #s listed in the respective Physical Planning Manuals. Ensure that the cable groups selected from the Physical Planning Manuals have the 25 pin data set interface. #4713 allows only two terminals to be attached, one per 3704 25 pin data set interface. There must be corresponding Business Machine Clocks in both the terminal and the 3704.

Terminal	Speed (bps)	Terminal Feature #(s)
1031A/1034	600	2068
1061	134.5	9115 or 9120
2740 mdl 1	134.5	9115 or 9120
2740 mdl 2	134.5	9115 or 9120
	600	7106 w 9121
2741	134.5	9115 or 9120
2845-2848	1200	9012
3767 [attaches via Line Set 1F (#4716) only]	300	7111 or 7113 w 9540 and 3719
	600	7112 w 9541 and 3719
	1200	7112 w 9542 and 3719
5010 (S/7)	134.5	1610 w 2165
	600	1610 w 2165
5100/5110	134.5	1525
	300	1525

Operation of the 3704 in Start/Stop mode at speeds greater than 600 bps is limited to common carrier leased facilities. For attachment to the 2711 Line Adapter Unit, use #4711 and/or #4714. The terminals may also communicate with a 3704 via Limited Distance Line Adapters ... see Chart 1, M2700 pages.

3704 LOCAL ATTACHMENT (SYNCHRONOUS)

In addition to the synchronous terminals being attached to the 3704 through common carrier facilities, they may also be connected directly to the 3704 using #4716. Below are the attachable terminals and the respective feature #(s). Cable groups may be traced via the feature #s given below and the feature #s listed in the respective Physical Planning Manuals. Ensure that the cable groups selected from the Physical Planning Manuals have the 25 pin data set interface. #4716 allows only two terminals to be attached; one per 3704 25 pin data set interface. There must be corresponding Business Machine Clocks in both the terminal and the 3704.

Terminal	Speed (bps)	Terminal Feature #(s)
1131	600	7690
	1200	7690
	2000	7690
	2400	7690
1826	1200	7551 w 7552
	2000	7551 w 7552
	2400	7551 w 7552
2020	1200	2074 w 4703
	2400	2074 w 4703
2025	1200	7551 w 7541
2701	600	7698 w 7401
	1200	7698 w 7692
	2400	7698 w 7693
2703	1200	7705 w 7710
2715 mdl 2	1200	7705
2772	1200	7705 w 9122
2780	1200	7705 w 9110
3115	600	7141
	1200	7141
3125	600	7141
	1200	7141
3135/3138	600	4640 w 9649
	1200	4640 w 9649
4331	600	See 4331 Communications Adapter (#1601) for details and prerequisites.
	1200	
	2400	
3271 mdl 1,2,11,12	1200	7820
3275 mdl 1,2,11,12	1200	7820
3276	1200	3701 w 9491 & 6301
3601/3602	1200	4501 or 6301 w 3701
3614	1200	3701 w 6301
3651 mdl 25/50/75	2400	7708
3704/3705	600	4650 w 9607
	1200	4650 w 9608
	2000	4650 w 9609
	2400	4650 w 9610
3735	1200	7705 w 5010
3741	1200	7705 w 9122
3747	1200	7705 w 9122



3704 Communications Controller

Terminal	Speed (bps)	Terminal Feature #(s)
3767 [attaches via Line Set 1F (#4716) only]	600 1200	9531 w 3719 9532 w 3719
3771/3773/3774/3775	1200	1482 w 3701
3780	1200 2400	7705 w 9122 and 9702 7705 w 9121 and 9704
3791	1200	3701 w 6301
Series/1	600 1200	2074** or 2094** 2074** or 2094**
5010 (S/7)	1200 2000 2400	2074 w 4800 and 4703 2074 w 4800 and 4703 2074 w 4800 and 4703
5110 (2772)	1200 2400	2074 w 3701 2074 w 3701
5231 mdl 2	1200	2074 w 4780 and 9334 and 9751
5320 (S/32)	600 1200	2074 w 3701 and 4703 2074 w 3701 and 4703
5340 (S/34)	600 1200	2500 w 3701 and 4703 2500 w 3701 and 4703
5404/6/8/10/12/15	600 1200 2000 2400	2074 w 4703 & 9750 & 9481 & 2838 2074 w 4703 & 9751 & 9481 & 2838 2074 w 4703 & 9752 & 9481 & 2839 2074 w 4703 & 9753 & 9481 & 2839

** Series/1 communication feature must have internal clock jumper installed.

Customer Responsibilities: See M2700 pages, this section. Also see the 3704/3705 Programming sales manual pages for attachment capability and refer to Host Systems Programming pages for possible restrictions to any of the above attachments.

PREREQUISITES: The 3704 requires a control unit position on a system channel. **NOTE:** Attachment to S/360 is in 2701,2702,2703 Emulation Mode only.

S/360 mdls 30 (submodels E & F), 40, 50 -- multiplexer channel (standard) ... see 2030, 2040, 2050.

S/360 mdls 65, 67 (in 65 mode), 75, 195 -- multiplexer channel of 2870 ... see 2870.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdls 135 thru mdl 158 -- byte multiplexer channel (standard) ... see appropriate unit.

S/370 mdls 165, 168, 195 -- multiplexer channel of 2870 ... see 2870.

3031 or 3032 Processor -- byte multiplexer channel (one is standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channel (2 are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (special feature) ... see 4331.

4341 Processor -- byte multiplexer channel (1 is standard) ... see 4341.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

Specify:

- [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): **#9902** for 208 V or **#9904** for 230 V.
- [2] Cabling: **#9080** for below floor, or **#9081** for on floor.
- [3] Color: **#9041** for red, **#9042** for yellow, **#9043** for blue, **#9045** for gray, or **#9046** for white.
- [4] For model A2, A3 or A4, Expansion Feature (#3600) is required ... see Special Features.
- [5] Communication Cable Order Form: A completed form must be submitted for: (1) Each new machine order ... (2) Each order where the added feature requires external cable. For cabling information, see appropriate Installation Manual, Physical Planning: S/360 -- GC22-6820 ... S/370 -- GC22-7004 ... 4300 -- GA27-3006.
- [7] Address Substitution (**#9001, #9002**). Required when lines at speeds greater than 19.2K bps and Communication Scanner Type 2 (#1642) with Communication Scanner Expansion (#9090) are ordered. Address Substitution allows multiple scanning of one Line Set's address at the expense of NOT scanning another Line Set's address and is invoked by the software support. The feature blocks scanning of up to two Line

Set positions depending on feature #s selected. The required feature or features is based on the number of high speed lines installed and their positions.

#9001 -- Blocks installation of a Line Set in Position 8 of LIB Type 1 in LIB Position 2.

#9002 -- Blocks installation of a Line Set in Position 7 of LIB Type 1 in LIB Position 2.

Maximum: One each of the above. **Prerequisites:** Communication Scanner Type 2 (#1642) and Line Interface Base Type A1 (#4700). **Field Installation:** Yes.

PRICES:	Mdl	MAC/MRC	ETP/MLC 2 yr	Purchase	MMMC
3704	A1	\$ 711	\$ 605	\$22,100	\$149
	A2	777	661	23,275	178
	A3	843	717	24,450	208
	A4	909	773	25,625	238

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Control Unit Purchase Option: 60%
Machine Group: D Per Call: 3 Warranty: A
Useful Life Category: 2 Upper Limit Percent: 0%
Model/Feature Additional Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	A1	A2	A3	A4
A1	—	\$1,175	\$2,350	\$3,525
A2	*	—	1,175	2,350
A3	*	*	—	1,175
A4	*	*	*	—

* Model downgrade.

SPECIAL FEATURES

EXPANSION FEATURE (#3600). Required for models A2, A3 and A4 or Communication Scanner Type 2 (#1642) on model A1. **Maximum:** One. **Field Installation:** Yes.

CHANNEL ATTACHMENT FEATURES

CHANNEL ADAPTER, TYPE 1 (#1541). For communication with a S/360, S/370 or 4300 byte multiplexer channel. All such communications are accomplished by one, two, three or four byte transfers, with deselection and reselection between each transfer. Data transfer rates are primarily dependent upon the 3704's internal processing requirements. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Remote Program Loader (#6260).

TWO CHANNEL SWITCH (#8002). To attach Channel Adapter, Type 1 (#1541) to two S/360, S/370 or 4300 channels, which may be on the same CPU or on two different CPUs. The Channel Adapter so equipped will, however, be capable of operation on only one channel at a time. Selection of which channel is to be operable is by means of a manual switch on the control panel. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Channel Adapter, Type 1 (#1541).

COMMUNICATION SCANNER FEATURES

COMMUNICATION SCANNER, TYPE 1 (#1641). The interface between the communication line attachment features and the central control unit. #1641 uses the 3704 interrupt facilities to allow the program to perform character assembly and disassembly, and allows for program control of line control, control character recognition, code translation and recovery functions. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with Communication Scanner, Type 2 (#1642). **Prerequisite:** At least one Business Machine Clock (#4650).

COMMUNICATION SCANNER, TYPE 2 (#1642). The interface between the communication line attachment features and the central control unit. #1642 assembles and disassembles characters automatically, provides character buffering for each line, and allows the program control of line control, control character recognition, code translation and recovery functions. The basic scanner is operational with one Line Interface Base Type A1 (#4700) only. **Maximum:** One. **Specify:** Communication Scanner Expansion (#9090) to permit installation of two LIBs of any types except LIB Type 1 (#4701). **Field Installation:** Yes. **Limitation:** Cannot be installed with Communication Scanner Type 1 (#1641). When #9090 is specified, only one LIB Type 1 (#4701) can be installed with #1642. **Prerequisites:** Expansion Feature (#3600) and at least one Business Machine Clock (#4650).



3704 Communications Controller

COMMUNICATION LINE ATTACHMENT FEATURES

Communication lines are attached to the 3704 through Line Interface Bases, of which there are several different types, to accommodate the various types of line terminations. Depending upon type, these LIBs will house from one to eight Line Sets each, which will allow attachment of from one to sixteen communication lines. The 3704 can house a maximum of two of these LIBs, allowing up to 32 lines to be attached. Note that the LIB positions in the 3704 must be specified ... see "LIB Position Designators" at end of this section.

LINE INTERFACE BASE, TYPE 1 (#4701). For attachment of up to eight of Line Sets Types 1A, 1B, 1C, 1D, 1E, 1F or 1H, in any combination. In lieu of one of these eight Line Sets, ONE of the following can be attached to this LIB:

- Modem Attachment Base (#5101) with up to two of Line Sets 1L or 1M, or one of each.
- Modem Attachment Base with Auto Answer (#5102) with up to two of Line Set 1P.
- One Line Set Type 1X (#4754) or 1Y (#4755) ... see Duplex Data Attachment Base (#3500).
- One Line Set 1Q (#4771) ... **Note:** This Line Set is installed in lieu of two of the eight Line Sets.

Maximum: Two with Communication Scanner, Type 1 (#1641) ... one with Communication Scanner Type 2 (#1642). **Field Installation:** Yes. **Limitation:** When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. **Prerequisite:** Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

LINE SET, TYPE 1A (#4711). [Low speed External Line Interface] For attachment of two start/stop communication lines at speeds up to 1200 bps, each of which has an EIA RS232C interface for attachment to an external modem. **Maximum:** Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). **Field Installation:** Yes. **Limitation:** When installed in combination with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. **Prerequisites:** Line Interface Base Type 1 (#4701) or Type A1 (#4700), plus a Business Machine Clock(s) (#4650), assigned by the program to this Line Set.

LINE SET, TYPE 1B (#4712). [Low Speed Duplex External Modem] Provides for attachment of one start/stop duplex communication line which has an EIA RS232C interface at speeds up to 1200 bps. This Line Set effectively combines two 3704 communication line ports into a true full-duplex data port. **Maximum:** Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). **Limitations:** Not program supported. When installed in conjunction with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. **Field Installation:** Yes. **Prerequisites:** Line Interface Base Type 1 (#4701) or Type A1 (#4700), plus a Business Machine Clock (#4650) assigned by the program to this Line Set.

LINE SET, TYPE 1C (#4713). [Low Speed Local Attachment] For attachment of two half-duplex IBM start/stop terminals at speeds up to 1200 bps via IBM provided cables. Modems are not required. **Note:** The attached terminal must provide a Business Machine Clock and external modem cable to which the 3704 Line Set 1C cable will connect. Total cable length must not exceed 200 feet. **Maximum:** Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). **Field Installation:** Yes. **Limitations:** When installed in combination with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. **Prerequisites:** Line Interface Base Type 1 (#4701) or Type A1 (#4700), plus a Business Machine Clock(s), (#4650), specified for the same speed as the terminal's clock.

LINE SET, TYPE 1D (#4714). [Medium Speed External Line Interface] For attachment of two start/stop or synchronous communication lines at speeds up to 9600 bps, each of which has an EIA RS232C interface for attachment to an external modem. **Maximum:** Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). **Field Installation:** Yes. **Limitation:** When installed in combination with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. **Prerequisite:** Line Interface Base Type 1 (#4701) or Type A1 (#4700). For speed in excess of 4800 bps, see Address Substitution and Scan Limits under "Specify."

LINE SET, TYPE 1E (#4715). [Auto-Call Unit] Provides two RS366 interfaces for attachment of external automatic calling units. **Maximum:** Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). **Field Installation:** Yes. **Limitation:** When installed in combination with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. **Prerequisite:** Line Interface Base Type 1 (#4701) or Type A1 (#4700).

LINE SET, TYPE 1F (#4716). [Medium Speed Local Attachment] For local attachment of two half-duplex, synchronous IBM terminals at speeds up to 2400 bps via IBM-provided cables. Modems

are not required. This Line Set requires different cable groups depending upon terminal type. For cabling information see Installation Manual - Physical Planning, GC22-7004; for Remote, see Multiplexers, GA27-3006. **Note:** The attached terminal must be equipped with a Business Machine Clock and must provide a standard external cable to which the 3704 Line Set Type 1F external cable will connect. Total cable length must not exceed 100 feet. **Maximum:** Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). **Field Installation:** Yes. **Limitation:** When installed in combination with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. **Prerequisites:** Line Interface Base Type 1 (#4701) or Type A1 (#4700), plus a Business Machine Clock(s), (#4650), specified for the same speed as the terminal's Business Machine Clock.

LINE SET, TYPE 1H (#4718). [Medium Speed Duplex External Modem] For attachment of one duplex synchronous communication line at a speed up to 9600 bps which has an EIA RS232C interface for attachment to an external modem. This Line Set provides for the transmission of data simultaneously in a transmit and receive mode. **Maximum:** Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). **Field Installation:** Yes. **Limitation:** When installed in combination with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. **Prerequisite:** Line Interface Base Type 1 (#4701) or Type A1 (#4700). For speed in excess of 4800 bps, see Address Substitution and Scan Limits under "Specify."

LINE INTERFACE BASE, TYPE A1 (#4700). For attachment of up to two synchronous Line Sets (Type 1G or 1J) and/or up to four Line Sets 1A, 1B, 1C, 1D, 1E, 1F or 1H, in any combination. In lieu of one of these four Line Sets, ONE of the following can be attached to this LIB:

- Modem Attachment Base (#5101) with up to two of Line Sets 1L or 1M, or one of each.
- Modem Attachment Base with Auto Answer (#5102) with up to two of Line Set 1P.
- One Line Set Type 1X (#4754) or 1Y (#4755) ... see Duplex Data Attachment Base (#3500).
- One Line Set Type 1Q (#4771) ... **Note:** This Line Set is installed in lieu of two of the four Line Sets.

Maximum: Two if Communication Scanner Expansion (#9090) is specified with Communication Scanner Type 2 (#1642) ... without #9090, maximum is one. **Field Installation:** Yes. **Limitations:** See Communication Scanner Type 2 (#1642). When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. **Prerequisite:** Communication Scanner Type 2 (#1642).

LINE SET, TYPE 1G (#4717). [High Speed External Modem] For attachment of one synchronous communication line for operation at 19.2K, 40.8K or 50.0K bps. Has a digital interface for attachment to a switched or leased "wideband" external modem. **Maximum:** Two. **Field Installation:** Yes. **Prerequisites:** Line Interface Base Type A1 (#4700) and Communication Scanner Type 2 (#1642). If Communication Scanner Expansion (#9090) is ordered with #1642, see "Address Substitution" under "Specify."

LINE SET, TYPE 1J (#4719). [External Mil Std 188C Modem] For attachment of one start/stop or synchronous communication line at a speed of up to 50.0K bps via an external modem having an interface that conforms to the requirements in Section 7.2.1 of MIL STD 188C. **Maximum:** Two. **Field Installation:** Yes. **Prerequisites:** Line Interface Base Type A1 (#4700) and Communication Scanner Type 2 (#1642). If Communication Scanner Expansion (#9090) is ordered with #1642, see "Address Substitution" under "Specify."

MODEM ATTACHMENT BASE - 2400 BPS (#5101). Provides for attachment of up to two of Line Set Type 1L or 1M (in any combination). **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with any of the following: Duplex Data Attachment (#3500), Line Set Type 1Q (#4771), Modem Attachment Base with Auto-Answer - 2400 bps (#5102), or Remote Program Loader (#6260). **Prerequisite:** Line Interface Base Type 1 (#4701) or Type A1 (#4700).

LINE SET TYPE 1L (#4751). [IBM 2400 bps Leased Point-to-Point Integrated Modem] For attachment of one synchronous leased line at speeds of 2400 or 1200 bps. This Line Set includes one IBM 2400 bps Integrated Modem equipped with Receive Equalization which is suitable for communication over a leased voice grade channel with an IBM 3872 or equivalent modem similarly equipped ... no external modem is required. **Maximum:** Two. **Field Installation:** Yes. **Limitation:** When installed in combination with Line Set Type 1M, the maximum of two applies to the TOTAL number of Line Sets. **Prerequisite:** Modem Attachment Base - 2400 bps (#5101).

LINE SET, TYPE 1M (#4752). [IBM 2400 bps Leased Multi-point Control Integrated Modem] For attachment of one synchronous leased line at speeds of 2400 or 1200 bps. This Line Set includes one IBM 2400 bps Integrated Modem which is suitable for commu-

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nication over a leased voice grade channel with a similar *IBM 3872 or equivalent* modem equipped with both transmit and receive equalization ... no external modem is required. **Maximum:** Two. **Field Installation:** Yes. **Limitation:** When installed in combination with Line Set Type 1L, the maximum of two applies to the TOTAL number of Line Sets. **Prerequisite:** Modem Attachment Base - 2400 bps (#5101).

MODEM ATTACHMENT BASE WITH AUTO ANSWER - 2400 BPS (#5102). For attachment of up to two of Line Set Type 1P. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with any of the following: Duplex Data Attachment Base (#3500), Line Set Type 1Q (#4771), Modem Attachment Base - 2400 bps (#5101). **Prerequisite:** Line Interface Base Type 1 (#4701) or Type A1 (#4700).

LINE SET, TYPE 1P (#4761). [IBM 2400 bps Switched Network, Integrated Modem] For attachment of one synchronous switched line at speed of 2400 or 1200 bps. Used for operation over the Public Switched Network via Common Carrier Data Coupler Type CBS (or equivalent). Automatic answering of incoming calls will be performed by the modem. Automatic equalization is effected at the beginning of each call. This modem communicates with either an IBM 2400/1200 bps Integrated Modem or the 3872 Modem equipped with a Switched Network feature ... no external modem is required. **Maximum:** Two. **Field Installation:** Yes. **Prerequisite:** Modem Attachment Base with Auto Answer - 2400 bps (#5102).

LINE SET, TYPE 1Q (#4771). [IBM 2400 bps Switched Network Integrated Modem with Automatic Call Originate] For attachment of one synchronous switched line at speeds of 2400 or 1200 bps. This Line Set includes one IBM 2400 bps Integrated Modem equipped with Auto-Answer and Automatic Call Originate functions. It is suitable for automatically dialing a remote terminal, the automatic answering of an incoming call, and is capable of communicating over the Public Switched Network with either an IBM 2400/1200 bps Integrated Modem or 3872 Modem equipped with either the Switched Network feature or Automatic Call Originate feature ... (the answering modem must be equipped with an auto-answer capability). This modem provides control to the Common Carrier Data Coupler Type CBS (or equivalent) to dial telephone numbers and to provide on-hook/off-hook control. No external modem is required. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Can only be used with a Rotary Dial System. Cannot be installed with Modem Attachment Base - 2400 bps (#5101), Modem Attachment Base with Auto Answer - 2400 bps (#5102) or Duplex Data Attachment Base (#3500). **Prerequisite:** Line Interface Base Type 1 (#4701) or Type A1 (#4700).

DUPLEX DATA ATTACHMENT BASE - 2400 BPS (#3500). For attachment of up to two of Line Set Type 1X or 1Y (in any combination). **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with any of the following: Line Set Type 1Q (#4771), Modem Attachment Base - 2400 bps (#5101), Modem Attachment Base with Auto Answer - 2400 bps (#5102), or Remote Program Loader (#6260). **Prerequisite:** Line Interface Base Type 1 (#4701) or Type A1 (#4700).

LINE SET, TYPE 1X (#4754). [IBM 2400 bps Leased Point-to-Point Duplex Data Integrated Modem] For attachment of one Duplex synchronous leased line at speeds of 2400 or 1200 bps. This Line Set includes one IBM 2400/1200 bps Leased Line Integrated Duplex Modem with Receive Equalization suitable for leased duplex point-to-point operation... no external modem is required. *This integrated modem must talk to a 2400 bps IBM 3872 or equivalent IBM modem.* **Maximum:** Two. **Field Installation:** Yes. **Limitation:** When installed in combination with Line Set Type 1Y, the maximum of two applies to the TOTAL number of Line Sets. **Prerequisite:** Duplex Data Attachment Base - 2400 bps (#3500).

LINE SET, TYPE 1Y (#4755). [IBM 2400 bps Multi-Point Master Duplex Data Integrated Modem] For attachment of one duplex synchronous leased line at speeds of 2400 or 1200 bps. This Line Set includes one IBM 2400/1200 bps Leased Line Integrated Duplex Modem without equalization suitable for leased duplex multi-point master operation ... no external modem is required. *This integrated modem must talk to a 2400 bps IBM 3872 or equivalent IBM modem.* **Maximum:** Two. **Field Installation:** Yes. **Limitation:** When installed in combination with Line Set Type 1X, the maximum of two applies to the TOTAL number of Line Sets. **Prerequisite:** Duplex Data Attachment Base (#3500).

LINE INTERFACE BASE, TYPE 2 (#4702). For attachment of up to four Line Sets Type 2A (#4721). **Maximum:** Two. **Field Installation:** Yes. **Limitation:** When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. **Prerequisite:** Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

LINE SET, TYPE 2A (#4721). [Telegraph Single Current] For attachment of two single current telegraph lines, each of which may be wired for 20 ma, 40 ma or 62.5 ma single current termination. **Maximum:** Four per LIB Type 2. **Field Installation:** Yes. **Prerequisites:** Line Interface Base Type 2 (#4702) and a Busi-

ness Machine Clock(s), (#4650), assigned by the program to this Line Set.

LINE INTERFACE BASE, TYPE 3 (#4703). For attachment of up to three Line Sets Type 3A or 3B in any combination. **Maximum:** Two. **Field Installation:** Yes. **Limitation:** When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. **Prerequisite:** Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

LINE SET, TYPE 3A (#4731). [Limited Distance Type 1 Line Adapter, 2-wire] For attachment of two half-duplex, start/stop lines at speeds up to 134.5 bps. Includes two IBM Limited Distance Type 1 (2-wire) Line Adapters and no external modems are required. **Note:** Total wire length of each line may not exceed 4.75 wire-miles ... see SRL GA24-3435* for more information on this Line Adapter. **Maximum:** Three per LIB Type 3. **Field Installation:** Yes. **Limitation:** When installed in combination with Line Set(s) Type 3B, the maximum of three applies to the TOTAL number of Line Sets per LIB. **Prerequisites:** Line Interface Base Type 3 (#4703) and a Business Machine Clock(s), (#4650), assigned by the program to this Line Set.

LINE SET, TYPE 3B (#4732). [Limited Distance Type 1 Line Adapter, 4-wire] For attachment of two start/stop lines at speeds up to 134.5 bps. Includes two IBM Limited Distance Type 1 (4-wire) Line Adapters and no external modems are required. **Note:** Total wire length of each line may not exceed 4.75 wire-miles ... see SRL GA24-3435* for more information on this Line Adapter. **Maximum:** Three per LIB Type 3. **Field Installation:** Yes. **Limitation:** When installed in combination with Line Set(s) Type 3A, the maximum of three applies to the TOTAL number of Line Sets per LIB. **Prerequisites:** Line Interface Base Type 3 (#4703) and a Business Machine Clock(s), (#4650), assigned by the program to this Line Set.

LINE INTERFACE BASE, TYPE 4 (#4704). For attachment of one Line Set, Type 4A, 4B or 4C. **Maximum:** Two. **Field Installation:** Yes. **Limitation:** When installed in combination with other LIBs, the maximum of two applies to the TOTAL number of LIBs. **Prerequisite:** Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

LINE SET, TYPE 4A (#4741). [Limited Distance Type 2 Line Adapter] For attachment of two half-duplex start/stop lines at speeds up to 600 bps. Includes two IBM Limited Distance Type 2 Line Adapters and no external modems are required. **Note:** Total wire length of each line may not exceed 8.25 wire-miles ... see SRL GA24-3435* for more information on this Line Adapter. **Maximum:** One per Lib Type 4. **Field Installation:** Yes. **Prerequisites:** Line Interface Base Type 4 (#4704) and a Business Machine Clock(s), assigned by the program to this Line Set.

LINE SET, TYPE 4B (#4742). [Leased Line, Line Adapter, 2-wire] For attachment of two half-duplex, start/stop lines at speeds up to 600 bps. Includes two IBM Leased Line, 2-wire, Line Adapters and no external modems are required ... see SRL GA24-3435* for more information on this Line Adapter. **Maximum:** One per LIB Type 4. **Field Installation:** Yes. **Prerequisites:** Line Interface Base Type 4 (#4704) and a Business Machine Clock(s), (#4650), assigned by the program to this Line Set.

LINE SET, TYPE 4C (#4743). [Leased Line, Line Adapter, 4-wire] For attachment of two start/stop lines at speeds up to 600 bps. Includes two IBM Leased Line, 4-wire, Line Adapters and no external modems are required. ... see SRL GA24-3435* for more information on this Line Adapter. **Maximum:** One per LIB Type 4. **Field Installation:** Yes. **Prerequisites:** Line Interface Base Type 4 (#4704) and a Business Machine Clock(s), (#4650), assigned by the program to this Line Set.

LINE INTERFACE BASE TYPE 8 (#4708). For attachment of up to two Modem Attachment Bases - 1200 bps (#5103). **Maximum:** Two. **Field Installation:** Yes. **Limitation:** When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. **Prerequisite:** Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

MODEM ATTACHMENT BASE - 1200 BPS (#5103). For attachment of up to two of Line Set 8A, 8B, 8C or 8D (in any combination). **Maximum:** Two per LIB Type 8 (#4708). **Field Installation:** Yes. **Prerequisite:** Line Interface Base Type 8 (#4708).

LINE SET, TYPE 8A (#4781). [IBM 1200 bps Leased Integrated Modem] For attachment of one start/stop or synchronous non-switched line at speeds up to 600 bps or at 1200 bps. This Line Set includes one IBM 1200 bps Integrated Modem ... no external modem is required. *This integrated modem must communicate with another IBM 1200 bps Integrated Modem.* **Maximum:** Two per Modem Attachment Base - 1200 bps (#5103). **Field Installation:** Yes. **Limitation:** When installed in combination with Line Set Type 8B, the maximum of two applies to the TOTAL number of lines per

* SRL GA24-3435-2 or later revision.



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Modem Attachment Base (#5103). **Prerequisites:** Modem Attachment Base - 1200 bps (#5103) and a Business Machine Clock (#4650) assigned by the program to this Line Set.

LINE SET, TYPE 8B (#4782). [IBM 1200 bps Switched Integrated Modem] For attachment of one start/stop switched line at speeds up to 600 bps or one synchronous switched line at speeds of 600 bps or 1200 bps. This feature is to be used in conjunction with the Public Switched Network via the Common Carrier Data Coupler CBS (or equivalent). This Line Set includes one IBM 1200 bps Switched Line Modem with Automatic Answer capability ... no external modem is required. *This integrated modem must communicate with another IBM 1200 bps Integrated Modem.* **Maximum:** Two per Modem Attachment Base - 1200 bps (#5103). **Field Installation:** Yes. **Limitation:** When installed in combination with Line Set Type 8A, the maximum of two applies to the TOTAL number of lines per Modem Attachment Base (#5103). **Prerequisites:** Modem Attachment Base - 1200 bps (#5103) and a Business Machine Clock (#4650) assigned by the program to this Line Set.

LINE SET, TYPE 8C (#4785). [IBM 1200 bps Leased Integrated Modem with a Bi-directional Interrupt Signal] This Line Set provides for communicating with an IBM 3767 Terminal operating in 2741 Line Control at a line speed of 300 bps using two wire common carrier facilities. The customer must specify the "No Echo Suppression" option from the common carrier. In addition to the above capability, this Line Set has the same functional capabilities as Line Set Type 8A (#4781) except that Line Set Type 8C is restricted to common carrier two-wire facilities. This Line Set includes one IBM 1200 bps Leased Integrated Modem ... no external modem is required. *This integrated modem must communicate with another IBM 1200 bps integrated modem.* **Maximum:** Two per Modem Attachment Base - 1200 bps (#5103). **Field Installation:** Yes. **Limitation:** When installed in conjunction with Line Set Type 8A, 8B or 8D, the maximum of two applies to the TOTAL number of Line Sets per Modem Attachment Base (#5103). **Prerequisites:** Modem Attachment Base - 1200 bps (#5103) and a Business Machine Clock (#4650) for each speed of operation by the program.

LINE SET, TYPE 8D (#4786). [IBM 1200 bps Switched Integrated Modem with a Bi-directional Interrupt Signal] This Line Set provides for communicating with an IBM 3767 Terminal operating in 2741 Line Control at a speed of 300 bps using common carrier switched facilities. In addition to the above capability, this Line Set has the same capabilities as Line Set Type 8B (#4782). This Line Set includes one IBM 1200 bps Switched Integrated Modem ... no external modem is required. *This integrated modem must communicate with another IBM 1200 bps integrated modem.* **Maximum:** Two per Modem Attachment Base - 1200 bps (#5103). **Field Installation:** Yes. **Limitation:** When installed in conjunction with Line Set Type 8A, 8B or 8C, the maximum of two applies to the TOTAL number of Line Sets per Modem Attachment Base (#5103). **Prerequisites:** Modem Attachment Base - 1200 bps (#5103) and a Business Machine Clock (#4650) for each operational speed for this Line Set. The operational speed is selected by the program. **Note:** This Line Set only has Half Duplex data transmission capability.

LINE INTERFACE BASE TYPE 9 (#4709). [IBM 1200 bps Switched Integrated Modem] For attachment of one synchronous switched line at speeds up to 1200 bps. This Line Interface Base includes a Line Set and one IBM 1200 bps Switched Integrated Modem equipped with Automatic Answering and Automatic Call Originate functions ... no external modem is required. This feature is to be used in conjunction with the Public Switched Network via the Common Carrier Data Coupler CBS (or equivalent). *This integrated modem must communicate with another IBM 1200 bps integrated modem.* **Maximum:** Two. **Field Installation:** Yes. **Limitations:** When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. **Prerequisites:** Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090), plus a Business Machine Clock (#4650) assigned by the program to the Line Set of this LIB.

LINE INTERFACE BASE TYPE 10 (#5000). For attachment of up to three of Line Set Type 10A (#4784). **Maximum:** Two. **Field Installation:** Yes. **Limitation:** When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. **Prerequisite:** Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

LINE SET, TYPE 10A (#4784). [IBM 1200 bps Leased Duplex Integrated Modem] For attachment of one Duplex synchronous leased line at speeds up to 1200 bps. This Line Set includes one IBM 1200 bps Duplex Integrated Modem ... no external modem is required. *This integrated modem must communicate with another IBM 1200 bps integrated modem.* **Maximum:** Three per Line Interface Base Type 10 (#5000). **Field Installation:** Yes. **Prerequisites:** Line Interface Base Type 10 (#5000) and a Business Machine Clock (#4650) assigned by the program to this Line Set.

BUSINESS MACHINE CLOCK (#4650). Provides clocking when

the attached external modem or internal IBM Line Adapter does NOT provide this clocking. **Maximum:** Four per Communication Scanner Type 1 (#1641) or Type 2 (#1642). **Field Installation:** Yes. **Limitation:** Required only when modem does not provide clocking, except that each Communication Scanner requires at least one clock which must be at a speed less than one-half that of the lowest speed modem clocked line. **Note:** Each Business Machine Clock may be assigned by the program to one or more communication lines. **Prerequisite:** Communication Scanner Type 1 (#1641) or Type 2 (#1642).

The speed of clocking must be specified for each #4650 as follows: These can be changed in the field.

Speed (bps)	Specify	Speed (bps)	Specify
45.5	#9601	150.0	#9611
50.0	9613	300.0	9612
56.9	9602	600.0	9607
74.2	9603	950.0*	9614
75.0	9604	1200.0	9608
110.0	9605	2000.0	9609
134.5	9606	2400.0	9610

* Supported for 2740 mdl 2 type line control only.

UNIT PROTECTION (#8510). Provides a lock on the 3704 which deactivates all switches (except power off and power on) when key is removed. Two keys are included. For additional or replacement keys, see "Locks and Keys" on M 10000 pages. **Maximum:** One. **Field Installation:** Yes.

REMOTE OPERATION

EXTENDED ENVIRONMENT (#3620). [mdl A3 or A4 only] Provides cooling such that a 3704 with Remote Program Loader (#6260) can operate in a Class C Environment with a temperature range of 50° F to 100° F. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Remote Program Loader (#6260).

REMOTE POWER OFF (#6250). [mdl A3 or A4 only] Provides the capability of turning the 3704's power off with a command over a communications line. **Maximum:** One. **Field Installation:** Yes.

REMOTE PROGRAM LOADER (#6260). [mdl A3 or A4 only] Provides the means of loading the NCP Program into the 3704 when there is no Channel Adapter on the machine. This feature also provides for diagnosing the communications controller without the aid of the CPU. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with any of the following: Channel Adapter Type 1 (#1541), Duplex Data Attachment Base - 1200 bps (#3500), Modem Attachment Base - 2400 bps (#5101).

LIB POSITION DESIGNATORS

The position of the Line Interface Bases within the 3704 must be specified in accordance with the following table.

LIB Type	Communication Scanner Type 1 (#1641)		Communication Scanner Type 2 (#1642)	
	Position 1	Position 2	Position 1	Position 2
A1	—	—	#9501	#9502
1	#9311	#9312	9511	9512
2	9321	9322	9521	9522
3	9331	9332	9531	9532
4	9341	9342	9541	9542
8	9381	9382	9581	9582
9	9391	9392	9591	9592
10	9401	9402	9701	9702

The LIBs must be assigned to position in numerical order, that is, LIB Type A1s must be assigned to the lowest numbered positions, LIB Type 1s next lowest, etc., so that the highest type-numbered LIB is in the highest numbered position. Each order submitted must indicate the Feature # for each LIB desired plus a location specify code (position number, from above table) based on the LIB Type.

The positions of the Line Sets within the LIBs will be automatically assigned.



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SPECIAL FEATURE PRICES:	MAC/ MRC	ETP/ MLC 2 yr	Purchase MMMC	
Business Machine Clk #4650	\$ 12	\$ 10	\$ 408	\$ 1.00
Channel Adapter Typ 1 1541	142	121	4,505	23.00
Comm Scanner Type 1 1641	25	21	816	1.50
Comm Scanner Type 2 1642	129	110	4,080	5.50
Expansion Feature 3600	12	10	408	.50
Extended Environment 3620	25	21	816	NC
Line Inter Base Typ 1 4701	25	21	816	1.50
Line Set Type 1A 4711†	36	31	1,235	2.00
Line Set Type 1B 4712†	36	31	1,235	2.00
Line Set Type 1C 4713†	36	31	1,235	2.00
Line Set Type 1D 4714†	103	88	3,275	8.50
Line Set Type 1E 4715†	63	54	2,040	3.00
Line Set Type 1F 4716†	103	88	3,275	8.50
Line Set Type 1H 4718†	109	93	3,485	15.50
Modem Att Base				
- 2400 bps 5101	109	93	3,485	3.50
Line Set Type 1L 4751†	63	54	2,040	12.00
Line Set Type 1M 4752†	58	49	1,830	11.00
Modem Att Base AA				
- 2400 bps 5102	129	110	4,080	3.50
Line Set Type 1P 4761†	69	59	2,255	17.50
Line Set Type 1Q 4771†	303	258	9,350	25.50
Duplex Data Att Base				
- 2400 bps 3500	83	71	2,635	3.00
Line Set Type 1X 4754†	103	88	3,275	16.50
Line Set Type 1Y 4755†	96	82	3,060	14.00
Line Inter Base Typ A1 4700	25	21	816	1.50
Line Set Type 1G 4717	83	71	2,635	9.50
Line Set Type 1J 4719	89	76	2,850	3.50
Line Inter Base Typ 2 4702	25	21	816	1.00
Line Set Type 2A 4721	63	54	2,040	5.50
Line Inter Base Typ 3 4703	78	66	2,465	3.50
Line Set Type 3A 4731	49	42	1,660	2.00
Line Set Type 3B 4732	49	42	1,660	2.00
Line Inter Base Typ 4 4704	49	42	1,660	4.50
Line Set Type 4A 4741	89	76	2,850	5.00
Line Set Type 4B 4742	89	76	2,850	7.50
Line Set Type 4C 4743	89	76	2,850	7.50
Line Inter Base Typ 8 4708	78	66	2,465	2.00
Modem Att Base				
- 1200 bps 5103	49	42	1,660	2.00
Line Set Type 8A 4781	19	16	630	4.00
Line Set Type 8B 4782	25	21	840	6.00
Line Set Type 8C 4785	54	46	1,005	17.50
Line Set Type 8D 4786	60	51	1,120	18.50
Line Inter Base Typ 9 4709	180	153	5,695	10.50
Line Inter Base Typ 10 5000	49	42	1,660	3.50
Line Set Type 10A 4784	115	98	3,655	9.00
Remote Power Off 6250	12	10	408	.50
Remote Program Lder 6260	194	165	6,120	38.50
Two Channel Switch 8002	63	54	2,040	4.00
Unit Protection 8510	35SUC	-	35	NC

† Also available with Line Interface Base Type A1 (#4700).

**IBM 3705 COMMUNICATIONS
CONTROLLER**

Purpose: The 3705-I and 3705-II attach to all S/370 or 4300 Processors, or in 2701/2702/2703 Emulation Mode only, to a S/360 mdl 30 (submodels E or F) (3705-I only), 40, 50, 65, 67 (in 65 mode), 75 and 195 for communication with local or remote I/O devices over various common carrier provided or customer owned communication facilities. NOTE: See "Programming" and "SCP" sales manual pages for attachment capability.

Highlights: A modular, programmable unit which expands the communications capabilities of S/360, S/370 or 4300 Processors. By virtue of its modularity and programmability, the 3705 boasts a high degree of flexibility in tailoring to a teleprocessing system's requirements. Also it can relieve the CPU of many TP functions, including, but not limited to, line control, polling, addressing, code translation and error recovery. The maximum number of communication lines which can be physically attached to a 3705 is 352 lines; but, the maximum number of communication lines capable of concurrent operation is a function of the speed of the lines, the type of Channel Adapter, memory size, and Communication Scanner installed and the programming mode of operation. The maximum number of lines which can be physically installed can exceed the operational capability, see "Specify" for "special scheduled" systems. The 3705-I has a 1.2 microsecond storage cycle time ... the 3705-II models E, F, G and H have a 1.0 microsecond storage time ... the 3705-II models J, K and L have a 900 nanosecond storage time.

Communications Facilities: The 3705 operates over common carrier provided or equivalent customer owned communications facilities. For information concerning these facilities, see the M 2700 pages, this section.

Customer Responsibilities: See M 2700 pages, this section. Also see 3704/3705 "Programming" sales manual pages for attachment capability and refer to Host Systems Programming pages for possible restrictions to the above attachments.

3705 LOCAL ATTACHMENT (START/STOP)

In addition to terminals being attached to the 3705 through common carrier facilities, they may also be connected directly to the 3705 units using #4713. Below are the attachable terminals and the respective feature #s. Cable groups may be traced via this feature # listing and the feature #s listed in the respective Physical Planning Manuals. Ensure that the cable groups selected from the Physical Planning Manuals have the 25 pin data set interface. #4713 allows only two terminals to be attached, one per 3705 25 pin data set interface. There must be corresponding Business Machine Clocks in both the terminal and the 3705.

Terminal	Speed (bps)	Terminal Feature #(s)
1031A/1034	600	2068
1061	134.5	9115 or 9120
2740 mdl 1	134.5	9115 or 9120
2740 mdl 2	134.5	9115 or 9120
	600	7106 w 9121
2741	134.5	9115 or 9120
2845/2848	1200	9012
3767 [attaches via	300	7111 or 7113 w 9540 and 3719
Line Set 1F	600	7112 w 9541 and 3719
	1200	7112 w 9542 and 3710
5010 (S/7)	134.5	1610 w 2165
	600	1610 w 2165
5100/5110	134.5	1525
	300	1525

3705 LOCAL ATTACHMENT (SYNCHRONOUS)

In addition to the synchronous terminals being attached to the 3705 through common carrier facilities, they may also be connected directly to the 3705 using #4716. Below are the attachable terminals and the respective feature #s. Cable groups may be traced via the feature #s given below and the feature #s listed in the respective Physical Planning Manuals. Ensure that the cable groups selected from the Physical Planning Manuals have the 25 pin data set interface. #4716 allows only two terminals to be attached, one per 3705 25 pin data set interface. There must be corresponding Business Machine Clocks in both the terminal and 3705.

Terminal	Speed (bps)	Terminal Feature #(s)
1131	600	7690
	1200	7690
	2000	7690
	2400	7690
1826	1200	7551 w 7552
	2000	7551 w 7552
	2400	7551 w 7552
2020	1200	2074 w 4703
	2400	2704 w 4703
2025	1200	7551 w 7541
2701	600	7698 w 7401
	1200	7698 w 7692
	2400	7698 w 7693
2703	1200	7705 w 7710
2715 mdl 2	1200	7705
2772	1200	7705 w 9122
2780	1200	7705 w 9110
3115	600	7141
	1200	7141
3125	600	7141
	1200	7141
3135/3138	600	4640 w 9649
	1200	4640 w 9649
4331	600	See Communications Adapter
	1200	(#1601) on 4331 for
	2400	for details and prerequisites.
3271 mdl 1,2,11,12	1200	7820
3275 mdl 1,2,11,12	1200	7820
3276	1200	3701 w 9491 and 6301
3601/3602	1200	4501 or 6301 w 3701
3614	1200	3701 w 6301
3651 mdl 25/50/75	2400	7708
3704/3705	600	4714 and 4650 w 9607
	1200	4714 and 4650 w 9608
	2000	4714 and 4650 w 9609
	2400	4714 and 4650 w 9610
3735	1200	7705 w 5010
3741	1200	7705 w 9122
3747	1200	7705 w 9122
3767 [attaches via Line	600	9531 w 3719
Set 1F (#4716) only]	1200	9532 w 3719
3771/3773/3774/ 3775	1200	1482 w 3701
3780	1200	7705 w 9122 and 9702
	2400	7705 w 9121 and 9704
3791	1200	3701 w 6301
Series/1	600	2074** or 2094**
	1200	2074** or 2094**
5010 (S/7)	1200	2074 w 4800 and 4703
	2000	2074 w 4800 and 4703
	2400	2074 w 4800 and 4703
5110 (2772)	1200	2074 w 3701
	2400	
5231 mdl 2	1200	2074 w 4780 and 9334 and 9751
5320 (S/32)	600	2074 w 3701 and 4703
	1200	2074 w 3701 and 4703
5340 (S/34)	600	2500 w 3701 and 4703
	1200	2500 w 3701 and 4703
5404/6/8/10/12/15	600	2074 w 4703 and 9750 and 9481
		and 2838
	1200	2074 w 4703 and 9751 and 9481
		and 2838
	2000	2074 w 4703 and 9752 and 9481
		and 2838
	2400	2074 w 4703 and 9753 and 9481
		and 2838

** Series/1 communication feature must have internal clock jumper installed.

3705 LOCAL ATTACHMENT (V35)

The following terminals may be attached locally to the 3705 using Line Set 1W (#4727) (Half Duplex) or Line Set 1Z (#4728) (Full Duplex) V35 interfaces. Cable groups may be traced via the feature numbers given below and the feature numbers listed in the respective Physical Planning manuals. No business machine clock is required in the attached device since clocking signals are provided by Business Machine Clock (#4651) in combination with #4727 and #4728.

#4727 Half Duplex

Terminal	Speed (bps)	Terminal Feature #
3705	14,400	4720
	57,600	4720
3776-3, 3776-4	14,400	4720
3777-1, 3777-2, 3777-3	14,400	4720



3705 Communications Controller (cont'd)
#4728 Full Duplex

Terminal	Speed (bps)	Terminal Feature #
3705	14,400	4726
	57,600	4726
3776-3, 4	14,400	4720
3777-3	14,400	4720

Machine Organization: The basic machine consists of the Central Control Unit (CCU) with storage (16K in the 3705-I and 32K in the 3705-II) and an operator's control panel. A minimum machine configuration must have, in addition to the base unit, the following features:

- [1] Either a Channel Adapter (CA) feature or the Remote Program Loader feature. The Channel Adapters have different levels of design providing various degrees of programming overhead in channel operation.
- [2] A Communication Scanner (CS) feature to provide for the connection between the Attachment Base feature and the Line Interface Base(s) features. Like the Channel Adapters the various Communication Scanners have varying degrees of performance.
- [3] An Attachment Base which provides a common connection between the Communication Scanner(s) and the Central Control Unit (CCU).
- [4] A Line Interface Base (LIB) which provides the connection between the CS and the various Line Sets. The LIB provides the hardware for the mounting of the individual Line Sets. Each LIB is designed for a certain set of functions in conjunction with the various Line Sets.
- [5] A Line Set (LS) which provides the electronics and external cables to interface to a communication facility. NOTE: Both the external cables and the Line Sets are individually ordered through the AAS system. The number of Line Sets that can be contained in a LIB is contingent upon the electronic hardware of a Line Set required to perform the functions supporting the communications facilities.
- [6] A Business Machine Clock which provides clocking of data in and out of the Communication Scanner.

Models: The 3705 consists of two versions, with various models based on either the number of frames and/or the storage capacity.

3705-I consists of core storage with a cycle time of 1.2 microseconds.

3705-II consists of monolithic storage with a cycle time of 1.0 microseconds (models E, F, G and H) or 900 nanoseconds (models J, K and L).

The model numbering of the 3705 is "x", "y". "x" is an alpha code designating the number of frames in a 3705; A represents one frame, B two, C three and D four frames for a 3705-I ... E represents one frame, F or J two, G or K three and H or L four frames for a 3705-II. "y" is a numeric code designating the storage size.

In the 3705-I, the storage is housed in each frame in quantities of one or two increments of core storage. In the 3705-II (models E, F, G and H), the storage is housed only in the first frame, which has up to nine increments of monolithic storage. The 3705-II, models J, K and L have 256K of storage in the first frame and 64K in the second frame. Additional storage in 64K increments may be installed in the second frame for a maximum of 512K bytes.

3705-I		3705-II	
Model	Core Storage (bytes)	Model	Monolithic Storage (bytes)
A1 - D8		E1 - L4	
A1, B1, C1, D1	16K	E1, F1, G1, H1	32K
A2, B2, C2, D2	48K	E2, F2, G2, H2	64K
B3, C3, D3	80K	E3, F3, G3, H3	96K
B4, C4, D4	112K	E4, F4, G4, H4	128K
C5, D5	144K	E5, F5, G5, H5	160K
C6, D6	176K	E6, F6, G6, H6	192K
D7	208K	E7, F7, G7, H7	224K
D8	240K	E8, F8, G8, H8	256K
		J1, K1, L1	320K
		J2, K2, L2	384K
		J3, K3, L3	448K
		J4, K4, L4	512K

PREREQUISITES: The 3705-I and 3705-II require a control unit position on a system channel unless only the Remote Program Loader (RPL) feature is installed. Note: Attachment to S/360 is in 2701, 2702, 2703 Emulation Mode only.

S/360 mdl 30 (submodels E and F), 40, 50 -- multiplexer channel

(standard) ... see 2030, 2040, 2050. NOTE: S/360 mdl 30 connects to 3705-I only.

S/360 mdl 65, 67 (in 65 mode), 75, 195 -- multiplexer channel of 2870 ... see 2870.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- byte multiplexer channel (standard), Selector or Block Multiplexer Channel (special features) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channel (standard) ... see 3138.

S/370 mdl 145 -- byte multiplexer channel or selector channel (standard), or Block Multiplexer Channel (special feature) ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdls 155, 155 II, 158 and 158 MP -- byte multiplexer channel or block multiplexer channels (standard) ... see 3155, 3158.

S/370 mdls 165, 165 II, 168, 168 MP and 195 -- selector channel of 2860, multiplexer channel of 2870, Selector Subchannel (special feature) of 2870, or block multiplexer channel of 2880 ... see 2860, 2870, 2880.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (special feature) ... see 4331.

4341 Processor -- byte multiplexer channel (standard) ... see 4341.

NOTE: The 3705-II attaches to a S/360 with a minimum of 128K bytes of storage.

Bibliography: GC20-0001

[1] All 3705-IIs are to be ordered as follows:

"A" models

"B" models

"C" models

"D" models

All 3705-IIIs are to be ordered as follows:

"E" models --

"F" or "J" models --

"G" or "K" models --

"H" or "L" models --



3705 Communications Controller (cont'd)

- [2] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V. *Field Installation:* Yes.
- [3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white. *Field Installation:* Yes.
- [4] Cabling: #9080 for below floor, or #9081 for on floor. *Field Installation:* Yes.

[5] Address Substitution/Upper Limit Scan: For 3705s with a Communication Scanner, Type 2, there are two methods of address modification: Upper Scan Limits and Address Substitution, which allow the Type 2 Scanner to operate a Line Set at speeds greater than 4800 bps. For information on USL, see the IBM 3704 and 3705 Principles of Operation, GC30-3004. Address Substitution (#9001, 9002, 9003, 9004): May be required when lines at speeds greater than 4800 bps are to be installed. Associated with the invocation by software, the Address Substitution capability allows multiple scanning of a Line Set's address at the expense of NOT scanning other Line Set addresses. The specify feature blocks the installation of a Line Set in those address positions that are not scanned by address substitution. The choice of which of the four following specify features is to be ordered should be based on the number of high speed lines to be installed and their relative line set positions within the first LIB position. The lowest position (#9001) should always be specified first, followed by each succeeding number. For those positions within a LIB where Address Substitution is invoked, only the even addresses are scanned.

- #9001 -- blocks installation of a Line Set in partition 8 (both 3705) on all Type 1 and Type 2 LIBs. Specify #9001 when the FIRST Line Set of the first LIB is to contain the high speed (greater than 4800 bps) line.
- #9002 -- blocks installation of a Line Set in partition 7 (3705) on all Type 1 and Type 2 LIBs. Specify #9002 when the SECOND Line Set of the first LIB is to contain the high speed (greater than 4800 bps) line.
- #9003 -- blocks installation of a Line Set in partition 6 (3705) on all Type 1, Type 2, Type 3 and Type 10 LIBs. Specify #9003 when the THIRD Line Set of the first LIB is to contain the high speed (greater than 4800 bps) line.
- #9004 -- blocks installation of a Line Set in partition 5 (3705) on all Type 1, Type 2, Type 3 and Type 10 LIBs. Specify #9004 when the FOURTH Line Set of the first LIB is to contain the high speed (greater than 4800 bps) line.

Maximum: One each of the above per 3705
Field Installation: Yes.

Note: When Address Substitution is specified, it will block Line Set installation in ALL LIBs in the 3705 and therefore, will reduce the physical line handling capability of the 3705. See IBM 3704/3705 Communications Controllers, Principles of Operations, GC30-3004, for further details. Address Substitution should not be used on a 3705 containing a Communication Scanner, Type 1 or Type 3.

High Speed Select: For the 3705 with a Communication Scanner, Type 3, there are two methods of address modification: Upper Scan Limits and High Speed Select, which allow the Type 3 Scanner to operate with Line Set speeds greater than 4800 bps. For information on USL, see the IBM 3704 and 3705 Principles of Operation, GC30-3004. High Speed Select (#9011, 9012, 9013, 9014, 9015, 9016, 9017, 9018) may be required when lines at speeds greater than 4800 bps are to be installed. The specify feature blocks the installation of a Line Set in a position whose address is not scanned. The choice of

which of the eight following features is to be ordered should be based on the number of high speed lines used and their relative positions within a LIB position. On special scheduled systems where a high speed line is used only a portion of the time, then the position does not have to be blocked if the Line Set positions (which would have been blocked) are not used simultaneously with the high speed line. Examples of this could be lines used for backup or load sharing purposes. For those positions within a LIB where High Speed Select is invoked, only the even addresses are scanned.

- #9011 -- blocks installation of a Line Set in partition 1 of the additional LIBs within a 3705 module. Only the 3705 module containing the high speed line is affected.
- #9012 -- blocks installation of a Line Set in partition 2.
- #9013 -- blocks installation of a Line Set in partition 3.
- #9014 -- blocks installation of a Line Set in partition 4.
- #9015 -- blocks installation of a Line Set in partition 5.
- #9016 -- blocks installation of a Line Set in partition 6.
- #9017 -- blocks installation of a Line Set in partition 7.
- #9018 -- blocks installation of a Line Set in partition 8.

Maximum: One each of the above per Communication Scanner, Type 3 (#1643).

Prerequisite: Communication Scanner, Type 3 (#1643).

Note: When High Speed Select is specified, it will restrict Line Set installation in all LIBs (except LIB Position 1) of the 3705 which has the scanner modification implemented. See IBM 3704/3705 Communications Controllers, Principles of Operation, GC30-3004.

[6] A Communication Cable Order must be submitted for: Each new 3705 machine order ... each order where the added feature requires external cable. For cabling information, see appropriate Installation Manual - Physical Planning: S/360 -- GC22-6820 ... S/370 -- GC22-7004 ... 4300 Processors -- GA27-3006. Also see Channel Adapters and Line Sets. For remote 3705-I or remote 3705-II, see Multiplexers, GA27-3006.

[8] 3705 Specification Sheet: A completed sheet, MAY be required. See "Line Attachment Configurator" at the end of "Special Features" section.

[9] Specify #9566 when two or more CA-4s are in the 3705-II configuration and the NCP/VS program product is installed or for EP/VS if PRPQ P85021 is installed with greater than one CA-4. Must be specified in every module in which CA-4 appears.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3705-I	A1	\$1,287	\$1,095	\$ 40,800	\$197
	A2	1,845	1,570	58,550	239
	B1	1,698	1,445	54,100	220
	B2	2,262	1,925	71,850	261
	B3	2,826	2,405	89,600	304
	B4	3,384	2,880	107,350	345
	C1	2,133	1,815	67,400	241
	C2	2,691	2,290	85,150	285
	C3	3,249	2,765	102,900	326
	C4	3,813	3,245	120,650	369
	C5	4,365	3,715	138,400	410
	C6	4,923	4,190	156,150	452
	D1	2,550	2,170	80,700	264
	D2	3,108	2,645	98,450	306
	D3	3,672	3,125	116,200	350
	D4	4,236	3,605	133,950	391
D5	4,794	4,080	151,700	433	
D6	5,352	4,555	169,450	475	
D7	5,916	5,035	187,200	517	
D8	6,474	5,510	204,950	560	
3705-II	E1	1,204	1,025	38,230	250
	E2	1,333	1,135	40,580	276
	E3	1,462	1,245	42,930	302
	E4	1,591	1,355	45,280	328
	E5	1,720	1,465	47,630	354
	E6	1,849	1,575	49,980	380
	E7	1,978	1,685	52,330	406
	E8	2,107	1,795	54,680	432
F1	1,616	1,375	51,530	271	



3705 Communications Controller (cont'd)

F2	1,745	1,485	53,880	297
F3	1,874	1,595	56,230	323
F4	2,003	1,705	58,580	349
F5	2,132	1,815	60,930	375
F6	2,261	1,925	63,280	401
F7	2,390	2,035	65,630	427
F8	2,519	2,145	67,980	453
G1	2,027	1,725	64,830	292
G2	2,156	1,835	67,180	318
G3	2,285	1,945	69,530	344
G4	2,414	2,055	71,880	370
G5	2,543	2,165	74,230	396
G6	2,672	2,275	76,580	422
G7	2,801	2,385	78,930	448
G8	2,930	2,495	81,280	474
H1	2,438	2,075	78,130	313
H2	2,567	2,185	80,480	339
H3	2,696	2,295	82,830	365
H4	2,825	2,405	85,180	391
H5	2,954	2,515	87,530	417
H6	3,083	2,625	89,880	443
H7	3,212	2,735	92,230	469
H8	3,341	2,845	94,580	495
J1	3,306	2,815	93,040	535
J2	3,564	3,035	97,740	587
J3	3,822	3,255	102,440	639
J4	4,080	3,475	107,140	691
K1	3,717	3,165	106,340	556
K2	3,975	3,385	111,040	608
K3	4,233	3,605	115,740	660
K4	4,491	3,825	120,440	712
L1	4,128	3,515	119,640	577
L2	4,386	3,735	124,340	629
L3	4,644	3,955	129,040	681
L4	4,902	4,175	133,740	733

ATTACHMENT BASE, TYPE 1 (#1301). Provides interface logic for Channel Adapter Type 1 and/or the Communication Scanner, Type 1. **Field Installation:** Yes. **Limitation:** #1301 is only placed in a 3705-II when used in conjunction with Channel Adapter, Type 1.

ATTACHMENT BASE, TYPE 2 (#1302). Provides interface logic for Communication Scanner, Types 2, 3 or 3 HS. **Field Installation:** Yes. #1302 is required for Communication Scanner, Types 2, 3 or 3 HS.

Notes: No more than one #1301 or #1302 is allowed per 3705.

Channel Adapter, Types 2, 3 and 4 contain the Attachment Base logic within the logic of their respective features.

CHANNEL ADAPTER: The Channel Adapter provides the logical interface between a 3705 and a S/360, S/370 or 4300 Processor. Every 3705 must have at least one Channel Adapter in the first module (except those units having the Remote Program Loader (#6260)). Channel Adapter, Type 1 can be placed in the first frame of a 3705. When a second Channel Adapter is a Type 2 or Type 3, then "ROS Substitution" must be specified on the first module (3705) ... specify #9754. When there are two or more Channel Adapters, Type 4, and the NCP/VS program product or EP/VS with PRPQ P85021 is installed, then "N ROS Substitution" must be specified on every module in which a CA-4 appears. Specify #9566. When ordering a Channel Adapter, use the specify to indicate total number of CAs in the 3705 and 3706 combined and place this specify on the first two frames (3705 and first 3706). If 1 CA, specify #9201 ... if 2 CAs, specify #9202 ... if 3 CAs, specify #9203 ... if 4 CAs, specify #9204.

External Cables: All Channel Adapters need external cables which must be ordered separately from the Channel Adapter features.

Limitations and Prerequisites:

- 3705-I (first module) can contain one Channel Adapter, Type 1, 2, 3 or 4. The (second module) can contain one Channel Adapter, Type 2, 3 or 4.
- When operating with ACF/NCP/VS the 3705-II (first module) can contain two channel adapters. The 3706 (second module) can contain two channel adapters. If two channel adapters are in one module (3705-II), at least one of the adapters must be CA-4. When operating with greater than one CA-4 and EP/VS with PRPQ P85021, two CA-4s can be in the same module. Note EP 3.0 standalone only supports one CA-4 in each module.
- No Channel Adapters are allowed in the third or fourth module. The Channel Adapters can be mixed with the following exceptions:
- CA 1 cannot be in a machine with either CA 4 or a Communication Scanner, Type 3, or a Communication Scanner, Type 3 High Speed.
- When either a CA 2 or CA 3 is in the 3705 with a CA 4, the CA 4 must be in the first module.
- Channel Adapters, Type 1 and Type 4 must be used with Emulation Mode of Operation and may be used with Network Control Mode of Operation.
- Channel Adapters, Type 2 and Type 3 are used only with Network Control Mode of the Network Control Program.
- Channel Adapter, Type 1 requires the Attachment Base, Type 1 as a prerequisite. Channel Adapters, Type 2, 3 and 4 contain the attachment base function within their respective features.
- For the 3705-II, if greater than two CAs are installed, the CAs must all be CA-4s. Up to four CA-4s are allowed.
- For the 3705-II, up to four I/O Channel Attachments are allowed (2 per frame).
- For the 3705-II, Remote Program Load-II (#6261) can co-exist with a Channel Adapter.
- For the 3705-II, if two CAs are in the same frame, then no Two Channel Switch (#8002) is allowed.
- 3705-II models J, K or L can not have a CA1.
- The Communication Scanner, Type 3 High Speed (CS-3 HS) can only be installed in a 3705-II.

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Base Control Unit Purchase Option: 60%
 Machine Group: D Per Call: 3 Warranty: A
 Useful Life Category: 2 Upper Limit Percent: 0%
 Model/Feature Additional Charge in lieu of AU Charge: 10%
 Termination Charge Months: 5 Termination Charge Percent: 25%

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

3705-I to 3705-I

Additional Module \$13,300
 Additional Storage per 32K bytes 17,750

3705-II models E, F, G to models F, G, H

Additional Module \$13,300
 Additional Storage per 32K bytes 2,350

3705-II models F, G, H to models J, K, L

3705-II model F8 to J1 \$25,060
 3705-II model G8 to K1 \$25,060
 3705-II model H8 to L1 \$25,060
 Additional storage per 64K \$4,700

From 3705-1 models to 3705-II models

To 3705 -II Mdl	From 3705-I Mdl			
	"A" Models	"B" Models	"C" Models	"D" Models
"E" Models	\$16,680 + (s)	\$16,680 + (s)	\$16,680 + (s)	\$16,680 + (s)
"F" Models	\$29,980 + (s)	\$16,680 + (s)	\$16,680 + (s)	\$16,680 + (s)
"G" Models	\$43,280 + (s)	\$29,980 + (s)	\$16,680 + (s)	\$16,680 + (s)
"H" Models	\$56,580 + (s)	\$43,280 + (s)	\$29,980 + (s)	\$16,680 + (s)

(s) Plus \$2,350 per additional 32K storage increment above E1, F1, G1 or H1.

Examples:

A1 to E4 = 3 increments (E1 to E4) or \$7,050 + the above price of \$16,680 for a total of \$23,730.
 C4 to H6 = 5 increments (H1 to H6) or \$11,750 + the above price of \$29,980 for a total of \$41,730.

SPECIAL FEATURES

ATTACHMENT BASES: The Attachment Base provides the physical and logical connection between the Channel Adapter Type 1 and the Central Control Unit and between the Central Control Unit and the various Communication Scanners. There are two Attachment Bases. A 3705 must have at least one Attachment Base and in some instances will have both Attachment Bases.



3705 Communications Controller (cont'd)

The placement of various RPL/CA and CA configurations is as follows:

3705-II

3705			
LIB Pos. 3 RPL CA-4	LIB Pos. 2	LIB Pos. 3	LIB Pos. 2
(B1)	(A1)	(B1)	(A1)
LIB Pos. 4 CS-3 CS-3HS	LIB Pos. 1	LIB Pos. 4 CS-3 CS-3HS	LIB Pos. 1
(B2)	(A2)	(B2)	(A2)
CCU	CS-2 CS-3 CS-3HS	LIB Pos. 5	CS-2 CS-3 CS-3HS
(B3)	(A3)	(B3)	(A3)
CCU	CA-1 CA-2 CA-3 CA-4	CA-4 LIB Pos. 6	CA-2 CA-3 CA-4
(B4)	(A4)	(B4)	(A4)

Note: CS-3 and CS-3 HS take two positions.

Allowable Hardware Channel Adapter Combinations:

1st CA Type	2nd CA Type	3rd CA Type	4th CA Type	ROS Type	Module Location				ROS Specify Code #
					1st CA	2nd CA	3rd CA	4th CA	
1	--	--	--	1	3705	--	--	--	--
1	2	--	--	Dual	3705	--	--	--	9754
1	3	--	--	Dual	3705	--	--	--	9754
2	--	--	--	2	3705	--	--	--	--
2	2	--	--	Dual	3705	--	--	--	9754
2	3	--	--	Dual	3705	--	--	--	9754
3	--	--	--	2	3705	--	--	--	--
3	2	--	--	Dual	3705	--	--	--	9754
3	3	--	--	Dual	3705	--	--	--	9754
4	--	--	--	1	3705	--	--	--	--
4	2	--	--	Dual**	3705	3705	--	--	9754
4	3	--	--	Dual	3705	--	--	--	9754
4	4	--	--	1;N	**3705	3705	--	--	9566
4	4	4	--	N	**3705	3705	--	--	9566
4	4	4	4	N	**3705	3706	--	--	--
4	4	4	4	N	**3705	3705	--	--	9566

** = Available only on 3705-II.

Definition of the different ROS types:

- (1) 1 - used to IPL over one channel-either a CA1 or CA4. It may be used to IPL over one or two CA4s if support programs for ACF/NCP/VS are not installed. No specification code is required for the type 1 ROS.
- (2) 2 - used to IPL over one channel-either a CA2 or CA3. No specification code is required for the type 2 ROS.
- (3) DUAL ("ROS Substitution") - used to IPL over one or two channels-using any appropriate combination shown above. Specification #9754 is required for Dual ROS.
- (4) N ("N POS Substitution") - used to IPL over one of 2, 3 or 4 channels (all channels must be CA4s and the support programs for ACF/NCP/VS Program Product or EP/VS with PRPQ P85021 must be installed). Specification #9566 is required for N ROS.
- (5) RPL - used to IPL remotely. There is a separate ROS for the 3705-I remote and the 3705-II remote. (Although remote is not mentioned on this page, it is listed here for convenience). No specification code is required for RPL ROS.

Allowable hardware Channel Adapter combinations with RPL/CA installed:

3705-II Only

RPL	1st CA Type	2nd CA Type	3rd CA Type	ROS Type	Module Location		
					RPL	1st CA	2nd CA	3rd CA
1	1	--	--	RPL/1	3705	3705	--
1	1	2	--	RPL/Dual	3705	3705	--
1	1	3	--	RPL/Dual	3705	3705	--
1	2	--	--	RPL/2	3705	3705	--
1	2	2	--	RPL/Dual	3705	3705	--
1	2	3	--	RPL/Dual	3705	3705	--
1	3	--	--	RPL/2	3705	3705	--
1	3	2	--	RPL/Dual	3705	3705	--
1	3	3	--	RPL/Dual	3705	3705	--
1	4	--	--	RPL/1	3705	3705	--
1	4	2	--	RPL/Dual	3705	3705	--
1	4	3	--	RPL/Dual	3705	3705	--
1	4	4	--	RPL/N	3705	3705	--
1	4	4	4	RPL/N	3705	3705	--

CHANNEL ADAPTER, TYPE 1 (#1541). For communication with a S/360, S/370, or 4300 Processor byte multiplexer channel. All such communications are accomplished via one, two, three or four byte transfers, with deselection and reselection between each transfer. Data transfer rates are primarily dependent upon the 3705's internal processing requirements. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See general description above.

CHANNEL ADAPTER, TYPE 2 (#1542). A high performance adapter which supports communication with a S/370 byte multiplexer, block multiplexer or selector channel, or a 4300 byte multiplexer or block multiplexer channel at data transfer rates of up to 276 kilobytes/second (limited by system channel capability). Transfer is always accomplished in "burst" mode, with a two-byte "burst" standard on the byte multiplexer channel, and full "burst" standard on the block multiplexer and selector channels. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See general description above.

CHANNEL ADAPTER, TYPE 3 (#1543). An adapter of the same performance characteristics as the Type 2 (#1542) with the additional capability of an automatic two processor switch. It communicates with a virtual storage S/370 byte multiplexer, block multiplexer, or selector channel (models 115 and 125 excepted), or a 4300 byte multiplexer or block multiplexer channel. The switch, part of the basic adapter, is primarily designed to furnish symmetric support for two tightly-coupled processors; i.e., each side of the switch is connected to one of the two MP CPUs. Additionally, this adapter can be attached to two channels from one CPU to provide alternate path capability. For either tightly-coupled multiprocessor or single CPU attachments, data transfer occurs on only one path at a time. Included as standard is a remote switch attachment capability to remotely control the switch from the configuration control panel of a S/370 mdl 158 MP or 168 MP, as well as from the 2925 Remote Switching Console Model 10. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See general description above.

CHANNEL ADAPTER, TYPE 4 (#1544). A channel adapter which provides attachment to S/360 byte multiplexer channel (EP) or S/370 byte multiplexer, block multiplexer or selector channel, or 4300 byte multiplexer or block multiplexer channel. It supports either a high performance Emulator Program running with a Type 3 Communication Scanner or Type 2 Communication Scanner or a high performance Network Control Program running the same scanners and Type 3HS Communication Scanner.

When attached to a byte multiplexer channel, the Type 4 transfers bytes in "bursts" of up to 32 bytes prior to interrupting the control program when running in EP mode. In ACF/NCP/VS mode, the Type 4 transfers in "bursts" up to 16 bytes and can transfer up to 248 bytes prior to interrupting the control program.

In ACF/NCP/VS mode, when attached to a S/370 block multiplexer or selector channel or 4300 block multiplexer channel, the Type 4 "bursts" up to 248 bytes and can transfer up to 248 bytes prior to interrupting the control program.

When the Type 4 is supported using the ACF/NCP/VS Program Product, the channel adapter operates in a cycle steal mode (data is directly moved to or from storage, and after this is accomplished, the control program resumes its operation at the completion of this stolen cycle unless another "cycle steal" request is pending). The cycle steal operation improves the 3705 throughput when compared with NCP/VS support of CA4 by reducing the number and complexity of control program interrupts.

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When attached to a byte multiplexer channel and supported by NCP/VS, the Type 4 transfers in bursts of 4 bytes per control program interrupt.

This channel adapter is necessary when using the Communications Scanner, Type 3 in Emulation Mode.

TWO CHANNEL SWITCH (#8002). To attach either Channel Adapter, Type 1 (#1541) or Type 2 (#1542) or Type 4 (#1544) to two S/360, S/370 or 4300 Processor channels, which may be on the same CPU or on two different CPUs. The Channel Adapter so equipped will, however, be enabled for operation on one channel at a time. Selection of which channel is to be operable is by a manual switch on the control panel. **Prerequisite:** Channel Adapter, Type 1 (#1541), Type 2 (#1542) or Type 4 (#1544). **Limitation:** If two CAs in the same frame, then no #8002 is allowed; otherwise, one #8002 per Channel Adapter.

COMMUNICATION SCANNER FEATURES: The Communication Scanner Features provide the common logical connection between the various Line Interface Bases with their respective Line Sets and the Central Control Unit. Each module of a 3705 must have a communication scanner if line sets are placed within the module. There are three communication scanners, each with a different merit of performance.

Field Installation: All communication scanners can be field installed.

Limitations:

- 1) One Communications Scanner per module. The communication scanners Type 2 and 3 can be placed within a 3705 in any combination.
- 2) A Communication Scanner, Type 1 (#1641) can only be placed in the first module of a 3705-I, cannot be placed in a 3705-II.
- 3) A Communication Scanner, Type 1 cannot be in a 3705 with a Communication Scanner, Type 2, or Type 3.
- 4) Each scanner must have at least one Business Machine Clock, but not more than four Business Machine Clocks.
- 5) The Communication Scanner, Type 3 only supports attachment of LIBs 1, 8, 9 and 10.
- 6) Communication Scanner, Type 3 cannot be in the 3705 (first module) of a 3705-I.
- 7) A Communication Scanner must be in a module containing Line Interface Base(s).
- 8) A Communication Scanner, Type 1 (#1641) cannot be installed with the NCP/VS Program Product.
- 9) Communication Scanner, Type 3, must have Business Machine Clock, specify #9615, and may have one other clock (specify #9609 or #9610).
- 10) *Communication Scanner, Type 3 High Speed, must have Business Machine Clock (#4650), Specify #9615; no other clock is allowed.*
- 11) *Communication Scanner, Type 3 High Speed allows for the attachment of only Line Sets 1GA (#4722) or 1TA (#4723).*
- 12) *Address Substitution is not allowed in a 3705 with a Communication Scanner, Type 3 High Speed (#1644). High Speed Select is not allowed in configuration with line set 1GA and for line set 1TA.*

Prerequisites: Communication Scanner, Type 1 must have an Attachment Base, Type 1 in the 3705. Communication Scanner, Type 2, Type 3, and Type 3HS must have an Attachment Base, Type 2 in the 3705. A Communication Scanner located in a particular module requires a Communication Scanner in each preceding module.

COMMUNICATION SCANNER, TYPE 1 (#1641). This feature has a lower performance capability than the other scanners due to a higher processing overhead requirement of data between storage and the line sets on a bit by bit basis. The scanner interrupts the control program each bit time so that the control program can perform character assembly and disassembly and also allows for program control of line control, control character recognition, code translation and error recovery functions. No line speed over 7200 bps is allowed. **Field Installation:** Yes. **Maximum:** One scanner per module. **Limitations and Prerequisites:** See general description above.

COMMUNICATION SCANNER, TYPE 2 (#1642). This feature provides for medium performance operation. It provides for the transfer of data between storage and the line sets on a byte-by-byte basis. The scanner assembles and disassembles characters. This scanner interrupts the control program on a byte-by-byte basis. The control program provides for the line control, control character recognition, code translation and error recovery functions. **Field Installation:** Yes. **Maximum:** One scanner per module. **Limitations and Prerequisites:** See general description above.

COMMUNICATION SCANNER, TYPE 3 (#1643). This feature provides a high performance operation. It provides for data transfer between storage and the line sets on a multi-byte (buffer)

basis. Data transfers between storage and the Communication Scanner, Type 3 is accomplished on a storage cycle steal basis (the CS-3 stops the control program for a machine cycle, moves data to or from storage. At the conclusion of the data movement, the control program resumes its operation at the point of the interrupt, unless another "cycle steal" request is pending). This feature supports only synchronous lines and provides control character recognition for BSC and SDLC line controls. It provides ASCII to EBCDIC and vice versa code translation when operating with BSC line control. The Communication Scanner, Type 3 interrupts the control program on either (up to 254 character) buffer boundaries, or by unique control characters, or at certain error conditions. It also provides for an auto-dial operation. **Field Installation:** Yes. **Maximum:** One scanner per module. **Limitations and Prerequisites:** See general description above.

COMMUNICATION SCANNER, TYPE 3 HIGH SPEED (#1644). *The Communication Scanner, Type 3 High Speed (#1644) is a modified CS-3 (#1643) which allows line speeds up to 230.4K bps. Only two half duplex data or one full duplex data line can be attached to this scanner. Field Installation: Yes. Maximum: One scanner per frame. Limitations and Prerequisites: See general description above.*

LINE INTERFACE BASES (LIBs). LIBs are used to provide the physical attachment of Line Sets in the 3705. LIB, Type 1 should be placed in LIB position 1, if Address Substitution or High Speed Select is to be required in the 3705. The LIBs with the highest speed lines should be placed in the lowest LIB positions (position 1 is the lowest).

FIGURE 1 - Maximum LIB Attachment Capability per Module:

LIBS		3705-I			
Module	1st	2nd	3rd	4th	
CS1	4	N/A	N/A	N/A	(Note 1)
CS2	4	6	6	6	(Note 1)
CS3	N/A	4	4	4	(Note 2)

LIBS		3705-II			
Module	1st	2nd	3rd	4th	
CS2	4	6	6	6	(Note 3)
CS3	3	4	4	4	(Note 2)
CS3 H.S.	1	1	1	1	(Note 6)

- Note 1: LIBs 1 through 12 can be attached to the Communication Scanner, Type 1 and 2 on the 3705-I.
- Note 2: LIBs 1, 8, 9 and 10 will attach to the Communication Scanner, Type 3 on the 3705-I or 3705-II (excluding Line Sets 1A, 1B and 1C).
- Note 3: LIBs 1 through 12 will attach to the Communication Scanner, Type 2 on the 3705-II.
- Note 4: LIBs 5 and 11 can only be placed in the 3705 (first module).
- Note 5: Line Sets operating over 10,000 bps must be in LIB position 1.
- Note 6: *The Line Set addresses for CS3 H.S. are 0 and 2, only one LIB 1 can operate with a CS3 H.S.*

Limitations: When installed with other LIBs of the same or different type, the maximum cannot be exceeded. There are no restrictions on intermixing LIBs.

Prerequisite: A Communication Scanner is required in each module containing LIB(s).

FIGURE 2 - Line Attachment Configurator

The positions of the Line Interface Bases within the 3705 and 3706(s) must be specified in accordance with the following table:

LIB Type	Positions					
	1	2	3	4	5	6
1	#9311	#9312	#9313	#9314	#9315	#9316
2	9321	9322	9323	9324	9325	9326
3	9331	9332	9333	9334	9335	9336
4	9341	9342	9343	9344	9345	9346
5	9351	9352	9353	9354		
6	9361	9362	9363	9364	9365	9366
7	9371	9372	9373	9374	9375	9376
8	9381	9382	9383	9384	9385	9386
9	9391	9392	9293	9394	9395	9396
10	9401	9402	9403	9404	9405	9406
11	9411	9412	9413	9414		
12	9421	9422	9423	9424	9425	9426

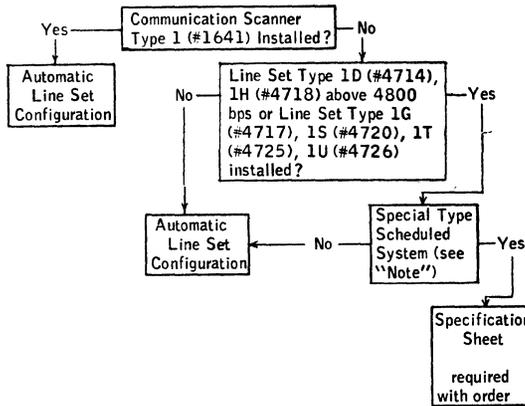
Important: Positions 1, 2, 3 and 4 apply to 3705



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The positions of the Line Sets within the LIB will, in most cases, be automatically assigned. To determine if this automatic assignment is applicable, use the following flow chart:

(Normally, the Specification Sheet should be used only if required by the flow chart below. If however, specific positions for line sets are desired even when the Automatic Line Set Configuration is suggested, fill out the Specification Sheet and submit it.)



Note: A "Special Type Scheduled System" is one in which the 3705 is effectively servicing two different TP networks on a scheduled basis. That is, one set of communication lines is serviced in one time period and a second set of lines in a second time period AND THERE IS NO OVERLAP OF THE TWO SYSTEMS IN TIME.

LINE INTERFACE BASE, TYPE 1 (#4701). Provides for attaching Line Sets which interface to EXTERNAL MODEMS, AUTO CALL UNITS, or DIRECTLY ATTACHED TERMINALS. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE INTERFACE BASE, TYPE 2 (#4702). Provides for attaching Line Sets which interface to TELEGRAPH circuits. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE INTERFACE BASE, TYPE 3 (#4703) and TYPE 4 (#4704). Provides for attaching IBM Limited Distance and leased line Line Adapters. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE INTERFACE BASE, TYPE 5 (#4705). Provides for attaching 2400 bps Leased Line Integrated Modems. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE INTERFACE BASE, TYPE 6 (#4706). Provides for attaching 2400 bps Switched Network Integrated Modem. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE INTERFACE BASE, TYPE 7 (#4707). Provides for attaching 2400 bps Switched Network Integrated Modem and Auto Call Unit -- no Line Sets required with this LIB. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE INTERFACE BASE, TYPE 8 (#4708). Provides for attaching 1200 bps Integrated Modems. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE INTERFACE BASE, TYPE 9 (#4709). Provides for attaching 1200 bps Integrated Modems and Auto Call Units. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE INTERFACE BASE, TYPE 10 (#5000). Provides for attaching 1200 bps Integrated Modems with Duplex Data transmission capability. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE INTERFACE BASE, TYPE 11 (#5001). Provides for attaching 2400 bps Integrated Modems with Duplex Data transmission capability. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE INTERFACE BASE, TYPE 12 (#5002). Provides for attaching 1200 bps Integrated Modems with a bi-directional Interrupt Signal. **Field Installation:** Yes. **Limitations, Prerequisites and Maximum:** See Figure 1.

LINE SETS: Line Sets provide the electronic logic to meet the individual requirements of the communication facility. (See Figure 2 for attachment capability of Line Sets with respect to LIBs). **Note:** All Line Sets except #4719 require external cables to be ordered in addition to ordering the Line Set feature(s).

FIGURE 3 - LIB-Line Set Configuration Chart

Line Interface Address on Lib	Partition Within LIB	LIB, Type 1													
		Line Set Type 1A - Low Speed External Modem	1B - Low Speed Duplex External Modem	1C - Low Speed Local Attachment	1D - Medium Speed External Modem	1E - Auto Call Unit	1F - Medium Speed Local Attachment	1G - High Speed External Modem	1H - Medium Speed Duplex External Modem	1J - External 480 Std 138 Modem	1S - CCITT V.35 Interface	T/1U High Speed Line	VW High Speed Local Attach	Z High Speed Local Attach	1TA - High Speed Ext
0	1	X	T	X	X	A	X	X	T	X	X				
2	2	X	T	X	X	A	X	X	T	X	X				
3	3	X	T	X	X	A	X	X	T	X	X				
4	3	X	T	X	X	A	X	X	T	X	X				
5	4	X	T	X	X	A	X	X	T	X	X				
6	4	X	T	X	X	A	X	X	T	X	X				
7	4	X	T	X	X	A	X	X	T	X	X				
8	5	X	T	X	X	A	X	X	T	X	X				
9	5	X	T	X	X	A	X	X	T	X	X				
A	6	X	T	X	X	A	X	X	T	X	X				
B	6	X	T	X	X	A	X	X	T	X	X				
C	7	X	T	X	X	A	X	X	T	X	X				
D	7	X	T	X	X	A	X	X	T	X	X				
E	8	X	T	X	X	A	X	X	T	X	X				
F	8	X	T	X	X	A	X	X	T	X	X				

* If the line speed is over 10,000 bps, the line set must reside in line address position 0, 2, 4 or 6 when attached to Communications Scanner, Type 2, or reside in line address positions 0, 2, 4, 6, 8, A, C or E when attached to Communications Scanner, Type 3. Over 10,000 bps, the line sets must reside in the first LIB, when attached to Communications Scanner, Type 2 or Type 3. NOTE: See Scan Limits, Address Substitution and High Speed Select under "Specify."

Line Interface Address on Lib	Partition Within LIB	LIB Type						
		Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	
0	1	X	X	X	X	X	X	X
1	1	X	X	X	X	X	X	X
2	2	X	X	X	X	X	X	X
3	2	X	X	X	X	X	X	X
4	3	X	X	X	X	X	X	X
5	3	X	X	X	X	X	X	X
6	4	X	X	X	X	X	X	X
7	4	X	X	X	X	X	X	X
8	5	X	X	X	X	X	X	X
9	5	X	X	X	X	X	X	X
A	6	X	X	X	X	X	X	X
B	6	X	X	X	X	X	X	X
C	7	X	X	X	X	X	X	X
D	7	X	X	X	X	X	X	X
E	8	X	X	X	X	X	X	X
F	8	X	X	X	X	X	X	X

Line Interface Address on Lib	Partition Within LIB	LIB Type					
		Type 8	Type 9	Type 10	Type 11	Type 12	
0	1	X	X	X	X	X	X
1	1	X	X	X	X	X	X
2	2	X	X	X	X	X	X
3	2	X	X	X	X	X	X
4	3	X	X	X	X	X	X
5	3	X	X	X	X	X	X
6	4	X	X	X	X	X	X
7	4	X	X	X	X	X	X
8	5	X	X	X	X	X	X
9	5	X	X	X	X	X	X
A	6	X	X	X	X	X	X
B	6	X	X	X	X	X	X
C	7	X	X	X	X	X	X
D	7	X	X	X	X	X	X
E	8	X	X	X	X	X	X
F	8	X	X	X	X	X	X

Legend

- X | Denotes a pair of addresses used for a two line interface line set if installed.
- A | Denotes a pair of addresses used for a two autocall interface line set if installed.
- | Denotes an unused address if this type of LIB is installed.
- X | Denotes a pair of addresses required for this line set if installed. "-" is an unused address.

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- T | Denotes a pair of addresses used for a single duplex data
R | line set if installed. Low order addresses are transmit
addresses. High order addresses are receive addresses.
- X | Denotes an address used for single line interface set if installed.
- X | Denotes a pair of addresses used for a single line interface
A | line set with ACO if installed. A is the auto call
interface address for ACO.

LINE SET, TYPE 1A (#4711). (Low Speed Start-Stop External Modem) For attachment of two start/stop communication lines at speeds up to 1200 bps, each of which has an EIA RS 232C interface for attachment to an external modem. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 1B (#4712). (Low Speed Duplex Data External Modem) Provides for the attachment of one start/stop duplex communication line which has an EIA RS 232C interface at speeds up to 1200 bps. This Line Set effectively combines two 3705 communication line ports into a true full-duplex data port. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 1C (#4713). (Low Speed Local Attachment) For attachment of two half-duplex IBM start/stop terminals at speeds up to 1200 bps via IBM-provided cables. Modems are not required. **Note:** The attached terminal must provide a Business Machine Clock and external modem cable to which the 3705/3706 Line Set, Type 1C cable connects. Total cable length must not exceed 200 feet. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 1D (#4714). (Medium Speed Terminal Interface - via External Modems) This Line Set provides for the attachment of external modem(s). One of the following attachments is permissible:

- Two start/stop communication lines (up to 1200 bps over non-switched facilities or 600 bps over switched facilities) transmitting half duplex data using external modems with EIA RS 232C interfaces.
- Two synchronous communication lines (up to 9600 bps over non-switched or switched facilities) transmitting half duplex data using external modems with EIA RS 232C interfaces.
- A Combination of one of each of the above.

Note: When operating this line set over 4800 bps refer to Address Substitution and High Speed Select under "Specify." **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 1E (#4715). (Auto Call Unit) Provides two RS 366 interfaces for attachment of external automatic calling units. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 1F (#4716). (Medium Speed Local Attachment) For local attachment of two half-duplex, synchronous IBM terminals or 3767 at speeds up to 2400 bps via IBM-provided cables. Modems are not required. This line set requires different cable groups depending upon terminal type. For cabling information, see Installation Manual - Physical Planning, GC22-7004; for Remote see Multiplexers, GA27-3006. **Note:** The attached terminals must be equipped with a Business Machine Clock and must provide a standard external cable to which the 3705/3706 Line Set, Type 1F external cable connects. Total cable length must not exceed 100 feet. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 1G (#4717). (High Speed External Modem) For attachment of one synchronous communication line for operation at 19.2K bps, or 50.0K bps. Has a digital interface for attachment to a switched or leased "wideband" external modem. See Scan Limits, Address Substitution and High Speed Select under "Specify." **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 1H (#4718). (Medium Speed Duplex External Modem) For attachment of one duplex synchronous communication line at a speed up to 9600 bps which has an EIA RS 232C interface for attachment to an external modem. This Line Set provides for the transmission of data simultaneously in a transmit and receive mode. **Note:** For speeds in excess of 4800 bps, see Scan Limits, Address Substitution and High Speed Select under "Specify." are not allowed with this line set. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 1J (#4719). (External Mil Std 188 Interface) Provides for the attachment of one start/stop or synchronous communication line at a speed up to 50.0K bps via an external modem having an interface that conforms to the requirements in Section 7.2.1 of Mil Std 188C. **Note:** No external cable is provided with this Line Set. For speeds greater than 7200 bps, Communication Scanner, Type 2 (#1642) or Communication Scanner, Type 3 (#1643) is required. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 1S (#4720). (Common Carrier 56,000 bps Attachment) Provides for the attachment of a single synchronous CCITT V35 type interface to be used on a communication facility at 56,000 bps. The 1S Line Set may be operated at 14,400 bps or 57,600 bps in conjunction with a 1W Line Set (#4727) in another 3705. See Scan Limits, Address Substitution and High Speed Select under "Specify." **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** see Figures 1 and 3.

LINE SET, TYPE 1T (#4725). (High Speed Duplex External Modem) 50K bps. This line set will only run with the NCP Program Product. This line set provides for the attachment of one duplex synchronous line which has a digital interface for attachment to an external data set for up to 50,000 bps leased or switched wideband facilities (not program supported for switched facilities). The control program must condition this line interface for external clock control. See Scan Limits, Address Substitution and High Speed Select under "Specify." **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 1U (#4726). (High Speed Duplex External Modem) 56K bps. This line set will only run with the NCP Program Product. This line set provides for the attachment of one duplex synchronous line which has a CCITT V35 type interface for attachment to a common carrier communication facility with line speeds up to 56,000 bps. The control program must condition this line interface for external clock control. The 1U Line Set may be operated at 14,400 bps or 57,600 bps in conjunction with a 1Z Line Set (#4728) in another 3705. See Scan Limits, Address Substitution and High Speed Select under "Specify." **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET TYPE 1GA (#4722). (High Speed External Modem) For attachment of one synchronous, half duplex data communication line for operation up to 230.4K bps, has a digital interface for attachment to a leased "wideband" external modem. **Field Installation:** Yes. **Maximum:** Two per L.I.B., Type 1 (#4701). **Prerequisites:** Communication Scanner, Type 3HS (#1644). **Limitations:** Up to two line sets of this type allowed in the same 3705/06 frame.

LINE SET TYPE 1TA (#4723). (High Speed External Modem) For attachment of one synchronous, full duplex data communication line for operation up to 230.4K bps. Has a digital interface for attachment to a leased "wideband" external modem. **Field Installation:** Yes. **Maximum:** One per L.I.B., Type 1 (#4701). **Prerequisites:** Communication Scanner, Type 3HS (#1644). **Limitations:** Only one line set per 3705/06 frame.

LINE SET TYPE 1W (#4727). (High Speed Local Attach) 14.4K or 57.6K bps half duplex data. This line set provides for local attachment of a single half duplex synchronous device which has a CCITT V35 type interface (similar to Line Set Type 1S). Clocking is provided by #4651 such that the attached device must be set for external clock control. The total cable length must not exceed 200 feet (60 meters). This is a combination of 150 feet (45 meters) of 3705 Line Set Cable and 50 feet (15 meters) of attached device cable. See Scan Limits, Address Substitution and High Speed Select under "Specify." **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET TYPE 1Z (#4728). (High Speed Local Attach Duplex) 14.4K or 57.6K bps duplex data. This line set provides for local attachment of one duplex synchronous device which has a CCITT V35 type interface (similar to Line Set Type 1U). Clocking is provided by #4651 such that the attached device must be set for external clock control. The total cable length must not exceed 200 feet (60 meters). This is a combination of 150 feet (45 meters) of 3705 Line Set Cable and 50 feet (15 meters) of attached device cable. See Scan Limits, Address Substitution and High Speed Select under "Specify." **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 2A (#4721). (Telegraph Single Current) For the attachment of two single current telegraph lines, each of which may be wired for 20 mA, 40 mA, or 62.5 mA single current termination. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 3A (#4731). (Limited Distance Type 1 Line Adapter, 2-wire) For attachment of two half-duplex, start/stop lines at speeds up to 134.5 bps. Includes two IBM Limited Distance Type 1 (2-wire) Line Adapters and no external modems are required. **Note:** Total wire length may not exceed 4.75 wire-miles... see SRL GA24-3435* for further details. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 3B (#4732). (Limited Distance Type 1 Line Adapter, 4-wire) For attachment of two start/stop lines at speeds up to 134.5 bps. Includes two IBM Limited Distance Type 1 (4-wire) Line Adapters and no external modems are required. **Note:** Total wire length may not exceed 4.75 wire-miles... see SRL GA24-3435* for further details. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

* SRL GA24-3435-2 or subsequent revisions.

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LINE SET, TYPE 4A (#4741). (Limited Distance Type 2 Line Adapter) For attachment of two half-duplex start/stop lines at speeds up to 600 bps. Includes two IBM Limited Distance Type 2 Line Adapters and no external modems are required. **Note:** Total wire length of each line may not exceed 8.25 wire-miles ... see SRL GA24-3435* for further details. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 4B (#4742). (Leased line, Line Adapter, 2-wire) For attachment of two half-duplex, start/stop lines at speed up to 600 bps. Includes two IBM Leased Line, 2-wire, Line Adapters and no external modems are required. **Note:** See SRL GA24-3435* for further details. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 4C (#4743). (Leased Line, Line Adapter, 4-wire) For attachment of two start/stop lines at speeds up to 600 bps. Includes two IBM Leased Line, 4-wire, Line Adapters and no external modems are required. **Note:** See SRL GA24-3435* for further details. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 5A (#4751). (2400 bps Leased Point-to-point Integrated Modem) For attachment of one synchronous line at a speed of 2400 or 1200 bps. The Line Set includes one 2400 bps Integrated Modem equipped with Receive Equalization which is suitable for communication over a leased voice grade channel with an IBM modem similarly equipped. No external modem is required. *This integrated modem must communicate with a 2400 bps IBM 3872 or equivalent IBM modem.* **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 5B (#4752). (2400 bps Leased Multi-point, Control, Integrated Modem) For attachment of one synchronous line at a speed of 2400 bps or 1200 bps. This Line Set includes one 2400 bps Integrated Modem which is suitable for communication over a leased voice grade channel with a similar modem equipped with both Transmit and Receive Equalization. No external modem is required. *This integrated modem must communicate with a 2400 bps IBM 3872 or equivalent IBM modem.* **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 6A (#4761). (2400 bps Switched Network, Integrated Modem) For attachment of one synchronous line at a speed of 2400 bps or 1200 bps. Used for operation over the Public Switched Network via Common Carrier Data Coupler Type CBS (or equivalent). Automatic Answering of incoming calls will be performed by the modem. Automatic Equalization is effected at the beginning of each call. This modem communicates with either a 2400/1200 bps Integrated Modem or the 3872 Modem equipped with a Switched Network feature. No external modem is required. **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 8A (#4781). (1200 bps Leased Line Adapter) Provides for the attachment of two start/stop or synchronous lines at speeds up to 600 bps or at 1200 bps. This Line Set includes two 1200 bps Line Adapters suitable for communication over a leased voice grade channel with similar Line Adapters. No external modems are required. *This integrated modem must communicate with another 1200 bps IBM integrated modem.* **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 8B (#4782). (1200 bps Switched Network Line Adapter) Provides for the attachment of two start/stop lines at speeds up to 600 bps or two synchronous lines at speeds of 600 bps or 1200 bps. This Line Set includes two 1200 bps Line Adapters equipped with Auto Answer suitable for communication over the Public Switched Network via Common Carrier Data Coupler CBS (or equivalent) with similar Line Adapters. No external modems are required. *This integrated modem must communicate with another 1200 bps IBM integrated modem.* **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 9A (#4791). (1200 bps Switched Network Line Adapter with Automatic Call Originate) Provides for the attachment of one synchronous line at a speed of 1200 bps or 600 bps. This Line Set includes one 1200 bps Line Adapter equipped with the Automatic Answering and Automatic Call Originate functions suitable for the automatic dialing of a remote terminal, the automatic answering of an incoming call and for communication over the Public Switched Network via Common Carrier Data Coupler CBS (or equivalent) with a similar Line Adapter (which need not be equipped with the Auto Answer and Auto Call Originate features). No external modems or automatic call units are required. *This integrated modem must communicate with another 1200 bps IBM integrated modem.* **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 10A (#4784). (1200 bps Leased Duplex Data Integrated Modem) For attachment of one duplex synchronous line at speeds up to 1200 bps. This Line Set includes one 1200 bps Duplex Data Integrated Modem. No external modem is re-

quired. *This integrated modem must communicate with another 1200 bps IBM integrated modem.* **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 11A (#4754). (2400 bps Leased Point-to-Point Duplex Data Integrated Modem) For attachment of one duplex synchronous line at speeds of 2400 bps or 1200 bps. This Line Set includes one 2400 bps Duplex Data Integrated Modem with equalization suitable for leased duplex point-to-point operation. No external modem is required. *This integrated modem must communicate with a 2400 bps IBM 3872 or equivalent IBM modem.* **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 11B (#4755). (2400 bps Leased Multi-point Master Duplex Data Integrated Modem) For attachment of one duplex synchronous line at speeds of 2400 or 1200 bps. This Line Set includes one 2400 bps Duplex Data Integrated Modem without equalization suitable for leased duplex multi-point master operation. No external modem is required. *This integrated modem must communicate with a 2400 bps IBM 3872 or equivalent IBM modem.* **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 12A (#4785). (1200 bps Leased Integrated Modem with a Bi-directional Interrupt Signal) This Line Set provides for two modems communicating with IBM 3767 Terminals operating in 2741 Line Control at a line speed of 300 bps using two wire common carrier facilities. The customer must specify the "No Echo Suppression" option from the common carrier. In addition to the above capability, the Line Set has the same functional capabilities as Line Set, Type 8A two-wire facilities. This Line Set includes two 1200 bps Leased Integrated Modems. No external modem is required. *This integrated modem must communicate with another IBM 1200 bps integrated modem.* **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

LINE SET, TYPE 12B (#4786). (1200 bps Switched Integrated Modem with a Bi-directional Signal) This Line Set provides for two modems communicating with 3767 Terminals operating in 2741 Line Control at the above capability. This Line Set has the same functional capabilities as Line Set, Type 8B (#4732) and includes two 1200 bps Switched Integrated Modems. No external modem is required. *This integrated modem must communicate with another IBM 1200 bps integrated modem.* **Field Installation:** Yes. **Maximum, Limitations and Prerequisites:** See Figures 1 and 3.

GENERAL FEATURES

UNIT PROTECTION (#8510). Provides a lock on the 3705 that deactivates all switches on the control panel (except power off and power on) when the key is removed from the lock. Two keys are included with this feature. For additional or replacement keys, see "Locks and Keys" on M 10000 pages. **Field Installation:** Yes. **Maximum:** One per 3705.

BUSINESS MACHINE CLOCK (#4650). Within each communication channel there must be a clocking mechanism to time the data rate. When this clocking mechanism is not provided by either the communication facility or the "modem," then the 3705 must provide the clocking through the use of a Business Machine Clock. The clock speed should match the data rate (in bits per second ... bps). The Business Machine Clocks are contained within the Communications Scanner. A clock in a Communication Scanner cannot be used by communication lines attached to a different Communication Scanner.

Each Communication Scanner, Type 1 or 2 must have at least one Business Machine Clock, with each scanner limited to a maximum of four clocks. If a Communication Scanner has at least one communication line attached where either the modem or the communication facility provides the clocking, then one of the possible four clocks in the scanner must be less than one-half the speed of the lowest externally clocked line attachment. All direct attached terminals must have a Business Machine Clock in the 3705 which matches the transmission rate (bps) of the terminal. **Notes:** [1] The Business Machine Clock is assigned to a given communication line interface under the control of the program operating in the 3705 ... [2] For purposes of determining Business Machine Clock requirements, Line Set 5A, 5B, 6A and 11A, and Line Interface Base, Type 7 provide "modem clocking" ... [3] Communication Scanner, Type 3 must have Business Machine Clock, specify #9615 and may have one other clock (either specify #9609 or #9610).

The following Line Sets must have a Business Machine Clock:

Line Set, Type 1A (#4711)	Line Set, Type 4B (#4742)
Line Set, Type 1B (#4712)	Line Set, Type 4C (#4743)
Line Set, Type 1C (#4713)	Line Set, Type 8A (#4781)
Line Set, Type 1F (#4716)	Line Set, Type 8B (#4782)
Line Set, Type 2A (#4721)	Line Set, Type 9A (#4791)
Line Set, Type 3A (#4731)	Line Set, Type 10A (#4784)
Line Set, Type 3B (#4732)	Line Set, Type 12A (#4785)
Line Set, Type 4A (#4741)	Line Set, Type 12B (#4786)

* SRL GA24-3435-2 or subsequent revisions.



3705 Communications Controller (cont'd)

The following Line Sets may require a Business Machine Clock if the clocking is not supplied by the modem:

Line Set, Type 1D (#4714) Line Set, Type 1J (#4719)
Line Set, Type 1H (#4718)

A Business Machine Clock is required for each speed; specify one of the following speeds for each Business Machine Clock.

Speed (bps)	Specify	Speed (bps)	Specify
45.5	#9601	150.0	#9611
50.0	9613	300.0	9612
56.9	9602	600.0	9607
74.2	9603	950.0	9614
75.0	9604	1200.0	9608
110.0	9605	2000.0	9609
134.5	9606	2400.0	9610
		150, 600, 1200	9615*

* Specify #9615 is only available with Communication Scanner, Type 3 (#1643) and is mandatory on Communication Scanner, Type 3 High Speed (#1644).

BUSINESS MACHINE CLOCK (#4651). when either Line Set Type 1W (#4727) or Line Set Type 1Z (#4728) is located in a L.I.B. Type 1 (#4701) then a Business Machine Clock must be added to the L.I.B. **Specify:** #9621 for 14.4K bps, #9622 for 57.6K bps. **Prerequisites:** 1.1 #4727 or #4728 in L.I.B. position one. **Maximum:** One per 3705/3706 module. **Limitations:** Must be applied to L.I.B. 1 in position one of a 3705 module.

REMOTE COMMUNICATIONS CONTROLLER (3705-I)

EXTENDED ENVIRONMENT (#3620). Applies to the 3705 in A model, but to the last in B, C, D models. Provides cooling such that a 3705-I with Remote Program Load (#6260) can operate in a Class B Extended Environment with a temperate range of 10° C to 37.8° C (50° F to 100° F). **Field Installation:** Yes. **Prerequisite:** Remote Program Loader (#6260) on the associated 3705-I frame.

INTERNAL AIR CIRCULATION 1 and 2 (#4670, 4671). Internal Air Circulation 1 (#4670) and Internal Air Circulation 2 (#4671) provide for dissipation of the internal heat for the first and second blocks of core storage respectively, in each module (3705/3706) of the 3705-I. The following table indicates which Air Circulation features (#4670 and #4671) must be ordered for each module depending on the 3705-I model involved.

Model	3705		w #9751		w #9752		w #9753	
	Core Storage		Core Storage		Core Storage		Core Storage	
	16K	32K	32K	32K	32K	32K	32K	32K
	#4670	#4671	#4670	#4671	#4670	#4671	#4670	#4671
A2	X	X						
B2	X	X						
B3	X	X	X					
B4	X	X	X	X				
C2	X	X						
C3	X	X	X					
C4	X	X	X	X				
C5	X	X	X	X	X			
C6	X	X	X	X	X	X		
D2	X	X						
D3	X	X	X					
D4	X	X	X	X				
D5	X	X	X	X	X			
D6	X	X	X	X	X	X		
D7	X	X	X	X	X	X	X	
D8	X	X	X	X	X	X	X	X

Maximum: Depending on the 3705 model, one #4670 and one #4671 per 3705 as indicated in the above chart. **Field Installation:** Yes.

REMOTE POWER OFF (#6250). This feature applies to both the 3705-I and 3705-II, but the following detail reflects the requirements of this section (Remote 3705-I) only. Provides the capability of turning the 3705-I power off with a command over a communication line. **Maximum:** One per 3705-I. **Field Installation:** Yes. **Prerequisite:** Remote Program Loader (#6260).

REMOTE PROGRAM LOADER (#6260). For the 3705-I. Provides the means of remotely loading the NCP Program when there is no Channel Adapter on the machine. **Maximum:** One per 3705-I. **Field Installation:** Yes. **Limitation:** For the 3705-I, cannot be

installed with any of the following: Channel Adapter, Type 1, 2, 3 or 4 (#1541-1544), Communication Scanner, Type 3 (#1643), LIB Type 5 (#4705), or LIB Type 11 (#5001). Also see Extended Environment (#3620) and Internal Air Circulation 1 and 2 (#4670 and #4671). **Specify:** For plant or field installation, one of the following must be specified, depending on the 3705 model involved.

For "A" model -- Specify #9591 (RPL Model A) on 3705.
For "B" model -- Specify #9592 (RPL Model B) on 3705

For "C" model -- Specify #9593 (RPL Model C) on 3705

For "D" model -- Specify #9594 (RPL Model D) on 3705

3705-I Model Change in the Field: If an installed machine is already equipped with Remote Program Loader (#6260), specify #9590 (RPL Already Installed) on being ordered to effect the model change to B, C or D as follows:

For model B --
For model C --
For model D --

** These codes are described under item 1 of "Specify".

REMOTE COMMUNICATIONS CONTROLLER (3705-II)

REMOTE POWER OFF (#6250). This feature applies to both the 3705-I and 3705-II, but the following detail reflects the requirements of this section (Remote 3705-II) only. Provides the capability of turning the 3705-II power off with a command over a communication line. This feature is applicable to the 3705-II when then the 3705-II is utilized only as a remote stand-alone. **Maximum:** One per 3705-II. **Field Installation:** Yes. **Prerequisite:** Remote Program Loader - II (#6261).

REMOTE PROGRAM LOADER-II (#6261). For the 3705-II. Provides the means of remotely loading the NCP with or without a Channel Adapter on the machine. **Maximum:** One per 3705-II. **Field Installation:** Yes. **Limitation:** For the 3705-II, cannot be installed with four Channel Adapter Type 4s (#1544), but any other proper CA combination (see CA section) is acceptable; also, the RPL-II feature on the 3705-II cannot be installed with LIB Type 5 (#4705) or LIB Type 11 (#5001) unless there is a Channel Adapter also installed.



3705 Communications Controller (cont'd)

Special Feature Prices:		MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Attach Base Type 1	#1301	\$ 19	\$ 16	\$ 641	\$.50
Attach Base Type 2	1302	19	16	641	.50
Channel Adapter Typ 1	1541	110	94	3,555	15.50
Channel Adapter Typ 2	1542	202	172	6,470	15.50
Channel Adapter Typ 3	1543	407	346	12,910	18.50
Channel Adapter Typ 4	1544	176	150	5,800	13.50
Comm Scanner, Type 1	1641	58	49	1,880	10.00
Comm Scanner, Type 2	1642	196	167	6,250	15.50
Comm Scanner, Type 3	1643	687	585	22,640	52.00
Comm Scanner, Type 3HS	1644	922	785	25,120	62.00
Extended Environment	3620	25	21	832	NC
Business Machine Clk	4650	12	10	424	1.00
Business Machine Clk	4651	26	22	880	2.00
Internal Air Circ 1	4670	12	10	416	NC
Internal Air Circ 2	4671	6	5	207	NC
Line Inter Base Type 1	4701	43	37	1,455	4.50
Line Set Type 1A	4711	19	16	641	2.00
Line Set Type 1B	4712	20	17	676	2.00
Line Set Type 1C	4713	19	16	641	2.00
Line Set Type 1D	4714	41	35	1,355	4.50
Line Set Type 1E	4715	32	27	1,030	3.00
Line Set Type 1F	4716	65	55	2,090	8.50
Line Set Type 1G	4717	83	71	2,695	9.50
Line Set Type 1H	4718	71	60	2,295	15.50
Line Set Type 1J	4719	43	37	1,455	3.50
Line Set Type 1S	4720	92	78	3,020	9.50
Line Set Type 1T	4725	149	127	4,850	15.00
Line Set Type 1U	4726	166	141	5,440	17.00
Line Set Type 1GA	4722	83	71	2,695	9.50
Line Set Type 1TA	4723	149	127	4,850	15.00
Line Set Type 1W	4727	139	118	4,720	9.50
Line Set Type 1Z	4728	254	216	8,640	17.00
Line Inter Base Type 2	4702	43	37	1,455	4.00
Line Set Type 2A	4721	32	27	1,030	5.50
Line Inter Base Type 3	4703	79	67	2,515	3.50
Line Set Type 3A	4731	25	21	850	2.00
Line Set Type 3B	4732	25	21	850	2.00
Line Inter Base Type 4	4704	49	42	1,665	4.50
Line Set Type 4A	4741	43	37	1,455	5.00
Line Set Type 4B	4742	43	37	1,455	7.50
Line Set Type 4C	4743	43	37	1,455	7.50
Line Inter Base Type 5	4705	110	94	3,555	8.50
Line Set Type 5A	4751	65	55	2,075	12.00
Line Set Type 5B	4752	58	49	1,860	11.00
Line Inter Base Type 6	4706	110	94	3,555	8.50
Line Set Type 6A	4761	71	60	2,295	15.50
Line Inter Base Type 7	4707	209	178	6,675	28.50
Line Inter Base Type 8	4708	43	37	1,455	5.50
Line Set Type 8A	4781	46	39	1,490	7.50
Line Set Type 8B	4782	59	50	1,920	9.50
Line InterBase Type 9	4709	43	37	1,455	4.00
Line Set Type 9A	4791	65	55	1,785	15.50
Line Inter Base Typ 10	5000	49	42	1,685	3.50
Line Set Type 10A	4784	83	71	2,685	9.00
Line Inter Base Typ 11	5001	98	83	3,120	4.50
Line Set Type 11A	4754	98	83	3,120	16.50
Line Set Type 11B	4755	90	77	2,900	14.00
Line Inter Base Typ 12	5002	42	36	1,190	4.50
Line Set Type 12A	4785	116	99	3,265	24.00
Line Set Type 12B	4786	129	110	3,605	27.00
Remote Power Off	6250	12	10	416	.50
Remote Program Ldr	6260	262	223	8,320	45.00
Remote Progrm Ldr-II	6261	294	250	9,335	41.00
Two Channel Switch	8002	65	55	2,090	4.00
Unit Protection	8510	35SUC	-	35	NC

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3713 PRINTER

Purpose: Printer for all models of the 3741 (GSD product).

Highlights: Prints serially at a maximum rate of 40 cps, using the EBCDIC character set. The maximum print line is 128 print positions at 10 characters per inch spacing. Line spacing is 6 lines per inch.

The unit has a pin feed platen which permits the feeding of marginally punched continuous paper. A choice of 12-1/2, 13-1/8 or 13-7/8 inch hole-to-hole pin feed platen widths may be specified for the basic printer ... see "Specify." Smaller platens (to 5-1/4 inches hole-to-hole width) and platen interchangeability can be accommodated in conjunction with the adjustable margin special feature ... see "Special Features."

Matrix characters are formed by 7 vertical wires printing dots in up to 4 of 7 possible horizontal positions. Refer to SRL GA24-3488 for forms design considerations and limitations. Up to six-part forms can be printed with a maximum thickness of .018" (for optimum feeding and stacking, no more than three parts are recommended). Card stock continuous forms are not recommended.

PREREQUISITES: 3713 Printer Attachment (#8111) and appropriate Expansion Feature (#3891, 3892) on the 3741 Data Station or 3741 Programmable Work Station. See GSD sales manual.

Supplies: A black ribbon, IBM part number 1136970 or equivalent, is required.

Bibliography: IBM 3741 Data Station Reference Manual, GA21-9183, and IBM 3741 Data Station Operator Guide, GA21-9131.

SPECIFY: [1] Voltage (AC, 1-phase, 60 Hz): #9901 for 115 V, #9902 for 208V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. **FIELD INSTALLATION:** Not recommended.

[3] Pin Feed Platen: #9162 for 126 print positions (13-1/8" hole-to-hole), or #9167 for 120 print positions (12-1/2" hole-to-hole), or #9168 for 128 print positions (13-7/8" hole-to-hole).

Smaller pin feed platen widths can be specified in conjunction with the Adjustable Margin Feature (#1115) ... see "Special Features."

NOTE: Do not order #9168 unless paper is available in your area.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3713	1	\$ 174	\$ 148	\$5,610	\$72.50

Plan Offering: Plan B Warranty: B Machine Group: D
Purchase Option: 35% Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES

ADJUSTABLE MARGIN FEATURE (#1115). Provides operator adjustable right and left margin stops and accommodates additional platen widths and platen interchangeability. For available platen widths and feature numbers to be specified (#9151 thru #9168), see M 10000 pages. To obtain additional platens, see RPQ. **Field Installation:** Yes. **Note:** Do not select #9168 unless paper is available in your area.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Adj Margin Feature #1115	\$ 5	\$ 4	\$ 218	\$ 1

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in the M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND (#4450) - Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

3791

3732 TEXT DISPLAY STATION

Purpose: Provides a text entry and editing keyboard and display for the 3730 Distributed Office Communication System.

Highlights: The 3732 consists of a display and keyboard (special feature) that have been designed specifically to provide text entry and editing facilities for the 3730 Distributed Office Communication System. The 3732 displays all the text characters that can be entered at the keyboard and that can be printed by the system printers (with the exception of certain compound characters printed by overstriking). In addition, special graphic characters are displayed to denote certain text control functions.

The display is a 15 inch (diagonal) cathode ray tube display providing 24 lines of 80 characters each, to give a total of 1920 characters. For text entry and editing, lines 1 and 24 are reserved for system use, leaving 22 lines for text entry (line 1 displays a scale to indicate character position, and is used to display formatting information such as margin settings and tab stops, and to track cursor position; line 24 is used to display status information). When, with user programming, the 3732 is used for full-screen processing, the user has control over all 24 lines (except for minor restrictions on the use of lines 1 and 24). The display includes an anti-glare screen.

One of three keyboards may be ordered (as special features): a 77-key typewriter keyboard (#4621), a 77-key ASCII typewriter keyboard (#4622), or a 75-key typewriter keyboard (#4623). The keyboards contain a central text entry section that is similar in layout to typewriter keyboards. Both upper and lower case characters may be entered. In addition, the keyboards contain 29 function and control keys concerned with document creation, editing, formatting, and printing. The 3732 must be installed with a keyboard.

Text functions: The following text entry and editing functions are provided by the 3732:

- Automatic new line and word spill (allowing an operator to enter text without being concerned about line endings)
- Temporary left margin (providing automatic indentation)
- Adjustable right margin
- Adjust and no-adjust entry mode
- Insert mode
- Tabulation (providing normal, decimal, and centering tab stops)
- Column tabulation (allowing an operator to enter tabular material column-by-column)
- Required characters (new line, space, backspace, hyphen)
- Special characters (such as superscripts, subscripts, temporary left margin)
- Delete character, word
- Backspace deletion
- Underscore character, word, or group of words (separated by required spaces)

The following system functions are invoked using function keys on the 3732 keyboard:

- Block insert, copy, move, return, delete
- Delete line, sentence
- Screen advance, return
- Page advance, return
- (Go to) End, (Go to) Top of document

Additional 3732 functions include:

- Cursor-positioning keys to move the display cursor to any position within the display area (up, down, left, right, and "home" - the first available text character position)
- An audible alarm tone that, rather like the bell on a typewriter, warns an operator that a line or a screen is nearly full (e.g., in no-adjust mode the alarm tone sounds when a character is entered or moved into a position five characters from the right margin)
- a HELP key to aid users who have problems when operating the 3732
- A PRINT key to send the currently displayed document to a preassigned print queue, for printing as soon as the assigned printer is available
- An Adjust key to adjust the line length of the currently displayed document and to divide the document into pages
- A Display key to allow or inhibit the display of certain special characters (such as space, and tabs)

Attachment to Controller: The 3732 attaches to a 3791 Controller mdl 11C, 12A or 12B, via a coaxial cable at a distance of up to 609 meters (2,000 feet).

PREREQUISITES: 3791 Controller mdl 11C, 12A or 12B, with Configuration Support #9171 installed. Refer to 3791 in "Machines" for details.

Security and Integrity Features: A Security Keylock (#6340) helps prevent unauthorized use of the 3732. Text cannot normally be displayed or modified unless the key is in the ON position.

Problem Determination Procedures: To minimize machine downtime, users are encouraged to determine the cause of 3732 malfunctions using IBM-provided Problem Determination Procedures. Data obtained from these procedures is used to correct customer operating or programming errors, or is passed to a customer engineer to aid in isolating a machine malfunction. The Problem Determination Procedures are presented in an easy-to-follow graphic form and are contained in the 3732 *Problem Determination Guide*, GA33-3024 (stored in the keyboard).

Publications: Refer to the latest level of *IBM System/370 Bibliography of Industry Systems and Application Programs*, GC20-0370, for details of 3732 publications and 3730 system publications.

SPECIFY: [1] Voltage (120V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, or #9891 for non lock plug. If standard 2.8 meter (9 foot) power cable is not required, specify #9511 for 1.8 meter (6 foot) cable, #9512 for 3.7 meter (12 foot) cable, or #9513 for 4.5 meter (15 foot) cable.

[2] Cables: See M 10000 pages for cable prices and ordering instructions. For cable specifications, see 3790 *Communication System Installation Manual - Physical Planning*, GA27-2769.

[3] Character Set: Specify one of the following:

#9082 - for EBCDIC Character Set (word processing). Used with 77-key Typewriter Keyboard (#4621) and 75-key Typewriter Keyboard (#4623).

#9084 - for ASCII Character Set (B). Used with 77-key ASCII Typewriter Keyboard (#4622).

PRICES	Mdl	MRC	MLC 2 yrs	Purchase	MMMC
3732	1	\$ 98	\$ 83	\$2,905	\$ 24

Plan Offering: Plan B Warranty: B Machine Group: D
Purchase Option: 55% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5% Customer Set-Up: No

SPECIAL FEATURES

KEYBOARDS (#4621, 4622, 4623).

#4621 - 77-key Typewriter Keyboard, movable, typewriter-like layout, with 48 text entry keys and 29 function and control keys. **Prerequisite:** EBCDIC Character Set (#9082).

#4622 - 77-key ASCII Typewriter Keyboard, movable, ASCII typewriter-like layout, with 48 text entry keys and 29 function and control keys. **Prerequisite:** ASCII Character Set (B) (#9084).

#4623 - 75-key Typewriter Keyboard, movable, typewriter-like layout, with 46 text entry keys and 29 function and control keys. **Prerequisite:** EBCDIC Character Set (#9082).

Maximum: One of the above. **Field Installation:** Yes.

SECURITY KEYLOCK (#6340). A lock and key that normally prevents modification or display of the data in the display when the key is in the OFF position. For additional or replacement keys, see M10000 pages. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:		MRC	MLC 2 yrs	Purchase	MMMC
Keyboards -					
77-key Typewriter	#4621	\$ 14	\$ 12	\$ 420	\$ 2.50
77-key ASCII	4622	14	12	420	2.50
75-key Typewriter	4623	14	12	420	2.50
Security Keylock	6340	35SUC	-	35	N/C

IBM 3735 PROGRAMMABLE BUFFERED TERMINAL

Purpose: A programmable terminal capable of buffered source document creation, concurrent data capture, and subsequent batch transmissions via an integral binary synchronous communications adapter.

For possible use with the System/3, see GSD manual

Highlights: The 3735 consists of a control unit and an associated keyboard printer. The programmable control unit houses a fixed disk facility, logic circuits, and a binary synchronous communications adapter.

Keyboard -- an IBM Selectric® Keyboard with operator guidance lights and switches.

Printer -- a Selectric II 15.5 cps printer with friction feed platen (standard) or a pin feed platen (optional). Vertical forms movement, and automatic print element positioning can be provided by the control unit.

Control Unit -- contains a non-removable disk with approximately 62.8K bytes of customer usable storage, plus the IBM written terminal control program. Additional user storage is available in two increments of 41.8K bytes each and a third increment of 167.5K bytes, for a total of 314.1K bytes. Installation of some special features will reduce customer usable storage as shown in the "Customer Storage/Feature Table." A binary synchronous communications adapter for transmission rates to 4800 bps is standard. The control unit provides the focal point for application interaction with customer Form Description Programs, the IBM written subroutines, and the operator guidance lights and switches on the keyboard.

Customer Storage/Feature Table -- the addition of special features singly or in combination with other features will decrease customer usable storage as follows:

Feature	Total Storage Reduction
1. #7880 and/or #4600	1904 bytes
2. #4001	3808 bytes
3. #4001 and 1 above	5712 bytes
4. #1450 alone or with 1, 2 & 3 above	7616 bytes

Output Printer -- the 3286 Printer mdl 3 can be attached for 66 cps output printing.

Security Enhancement Features -- the Print Suppress capability (standard) allows selected data fields to be entered without being printed. The Keylock (special feature) is a key-operated switch which is located on the terminal control unit. When the switch is in the "off" position, no keyboard/printer operations are possible. Previously recorded data may be sent to the computer and data may be received from the computer provided the terminal was set up for this operation prior to the Keylock being set to the "off" position.

The Operator Identification Card Reader (special feature) is provided to enter terminal operator identification. This enhances the programmed control of the operator's access to data and allows an audit of his actions. The reader may also be used to enter any sequence of numeric characters pre-recorded on a card for other purposes such as transaction control, account control, and billing. The Operator Identification Card Reader also reads the Magnetic Credit Card announced for the 2730 Transaction Validation Terminal.

Transmission -- the 3735 operates in half-duplex mode over facilities C4, C5, D3, D4, D4SB, D5, D5SB, X1M or X2M ... for details concerning these facilities, see M 2700 pages.

Binary Synchronous Transmission -- allows for transmission rates of 1200, 2000, 2400 or 4800 bps.

The 3735 can communicate over multi-point or dial facilities to S/360 mdls 22 thru 195, or any S/370 or 4300 Processor. See "Programming" section for information on programming support.

Transmission Code -- one of two codes can be selected ... see "Specify" for EBCDIC or ASCII options.

Modems -- one Integrated Modem or External Modem can be used.

The standard 3735 provides a cable and standard EIA interface for connection of IBM Modems or non-IBM Data Sets at transmission rates of 1200, 2000, 2400 or 4800 bps. See "Special Features" for Integrated Modems that may be used instead of an external modem/data set. Switched network operation and Auto Answer are standard on the 3735. Multipoint Data Link Control (#5010) is required for leased point-to-point or multipoint operation. Synchronous Clock (#7705) is required for 1200 bps operation.

Speed (bps)	Facility (1)	Integrated Modem (1)	IBM External Modem (1)	3735 Prereq Feature
1200	C4	#5501	---	#7705
1200	D3	5500 (2)	---	5010 & 7705
2000	C5M/D4M	---	---	None/5010
2400	D4 (multipt or pt-t-pt)	---	3863-1	5010
2400	C5	5610	3872-1	None
2400	D4 (multipt)	5602	3872-1	5010
2400	D4 (pt-to-pt)	5600	3872-1	5010
2400	D4SB	5602 or 5600 and 7951	3872-1	5010
2400	X1M	---	---	5010
4800	D5 (multipt or pt-t-pt)	---	3864-1	5010
4800	C6	---	3874-1	None
4800	D5, D5SB (pt-to-pt)	---	3874-1	5010
4800	D5, D5SB (multipt)	---	3874-1	5010
4800	X2M	---	---	5010

NOTES: (1) For communication capabilities, modem utilization, and special features, see 3863, 3864, 3872, 3874 and M 2700 pages.

(2) C1 conditioning not required.

Customer Responsibilities -- it is recommended that a telephone handset, which may be used to originate a call over common carrier Public Switched Facilities, be provided within 15 feet of the 3735 to facilitate maintenance. For additional responsibilities also see M 2700 pages. In addition, since the 3735 is designed for sequential processing of customer applications, proper forms design is a customer responsibility.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (115 VAC, 1-phase, 3-wire, 60 Hz): Locking Plug -- #9880, or non-lock plug -- #9881.

[2] Transmission Code: #9761 for EBCDIC, or #9762 for ASCII. The 3735 keyboard and print element support the mono case 64-character ASCII and is supplied when #9762 is specified. **LIMITATION:** Not recommended for field installation.

[3] Print Element: If EBCDIC Transmission Code (#9761) is specified, Print Element (Part No. 1167043) is supplied and need not be specified. If ASCII Transmission Code (#9762) is specified, Print Element (Part No. 1167167) is supplied and need not be specified. With #9762, if a Dual Case element (Part No. 1167168) is desired, see pages TC 21 and TC 23 in "Type Catalog."

PRICES:	Mdl	MAC/MRC	Purchase	MMMM
	3735	1	\$ 369	\$11,390
			\$98.00	

Plan Offering: Plan B Purchase Option: 50% Machine Group: A
Warranty: B Useful Life Category: 2 Per Call: 1

SPECIAL FEATURES

ADD'L CUSTOMER STORAGE, 1st INCREMENT (#1001). Provides an additional 41.8K bytes of user storage. Together with the standard customer area of 62.8K, total user storage becomes 104.7K bytes. **Field Installation:** Yes.

ADD'L CUSTOMER STORAGE, 2nd INCREMENT (#1002). Provides a second increment of 41.8K bytes of user storage. Together with the standard area, plus #1001, the total user storage becomes 146.6K bytes. **Field Installation:** Yes. **Prerequisite:** Add'l Customer Storage, 1st Increment (#1001).

ADD'L CUSTOMER STORAGE, 3rd INCREMENT (#1003). Provides an additional 167.5K bytes of user storage. Together with the standard area, plus #1001 and #1002, the total user storage becomes 314.1K bytes. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Add'l Customer Storage, 1st Increment (#1001) and 2nd Increment (#1002). **Limitation:** Only 3735s serial No. 12001 and later can have this feature field installed.

BUFFER EXPANSION (#1450). Adds three 480-byte dynamic buffers that provide fast access local storage for user buffers and counters. Two index counters are supplied with this feature or with File Storage Capability (#4001). **Maximum:** One. **Field Installation:** Yes. **Limitation:** Customer storage is reduced by 7,616 bytes total when this feature is installed singly or in combination with any other special features. See "Customer Storage/Feature Table" under "Highlights."

5496 ATTACHMENT (#3950). To attach a 5496 Data Recorder mdl 1. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** 3735 Attachment (#7801) on the 5496.

FILE STORAGE CAPABILITY (#4001). Permits user access to a



3735 Programmable Buffered Terminal (cont'd)

portion of the 3735 disk storage for storage and retrieval of records that are coded with a simple identification key. The maximum record size, including an identification key and two data delimiters, is 236 bytes. The identification key can range from 1 to 15 bytes. Two index counters are supplied with this feature or with Buffer Expansion (#1450). **Maximum:** One. **Field Installation:** Yes. **Limitations and Restrictions:** There is no additional reduction of customer storage of 7,616 bytes when this feature is installed in combination with Buffer Expansion (#1450). On machines without #1450, this feature reduces customer storage by 3,808 bytes. See "Customer Storage/Feature Table" under "Highlights."

OPERATOR IDENTIFICATION CARD READER (#4600). A small (approximately 3" x 4" x 6") self-enclosed device for reading information from a Magnetically Striped and Encoded I.D. Card and a Magnetic Credit Card (2-1/8" x 3-3/8"). An 8-foot cable is provided to accommodate table-top use. Power is supplied by the 3735.

Maximum: One. **Field Installation:** Yes. See "Customer Storage/Feature Table" under "Highlights."

KEYLOCK (#4695). A key operated switch located on the control unit. When the switch is in the "off" position, no I/O is possible from the printer/keyboard. The control unit may be used for transmission provided it was set up to do so prior to keylock being set to the "off" position. This feature supplies two keys. For additional or replacement keys, see "Locks and Keys" in M 10000 pages. **Field Installation:** Yes.

MULTIPOINT DATA LINK CONTROL (#5010). Required for leased line attachment (point-to-point and multipoint). Allows multiple 3735s to be used on the same communications line with a CPU. Terminal can be polled or selected when acting as a tributary station in a multipoint system. All 3735s installed on the same line facility require this feature, and they must use the same transmission code and modem ... see Modems and M 2700 pages. **Field Installation:** Yes.

1200 BPS INTEGRATED MODEM (#5500). A modem for operation at 1200 bps over leased 2-wire or 4-wire voice-grade channel. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Synchronous Clock (#7705) ... Multipoint Data Link Control (#5010) is required for leased point-to-point and for multipoint operation. **Limitation:** Cannot be installed with 2400 BPS Integrated Modems (#5600, #5602, #5610). The communicating transmission control unit, ICA or Communications Adapter on a 4331 must be equipped with a 1200 BPS Integrated Modem, or the IBM 1200 BPS Line Adapter.

1200 BPS INTEGRATED MODEM, SWITCHED WITH AUTO ANSWER (#5501). A modem with auto answer for operation at 1200 bps over a switched telecommunications network via a Telephone Co. supplied Data Access Arrangement Type CBS, or equivalent. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Synchronous Clock (#7705). **Limitation:** Cannot be installed with 2400 BPS Integrated Modems (#5600, #5602, #5610). The communicating transmission control unit, ICA or Communications Adapter on a 4331 must be equipped with 1200 BPS Integrated Modem, or the IBM 1200 BPS Line Adapter.

2400 BPS INTEGRATED MODEM, POINT-TO-POINT (#5600). An integrated self-clocked modem for 2400 bps operation on point-to-point communications facilities ... 2- or 4-wire connection. Half speed capability is standard. Compensation for line distortion is via operator adjustment on the 3735 operator panel. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Submit an RPQ for operation on a basic 3002 channel. Multipoint Data Link Control (#5010). **Limitation:** Cannot be installed with Synchronous Clock (#7705), 1200 BPS Integrated Modem (#5500 or #5501), or 2400 BPS Integrated Modem (#5602 or #5610). This modem will operate with the IBM 3872 Modem equipped with Point-to-point Feature (#6101 or #6102).

2400 BPS INTEGRATED MODEM, MULTIPOINT (#5602). An integrated self-clocked modem for 2400 bps operation as a tributary station in a centralized multipoint network ... 4-wire. Half speed capability is standard. Compensation for line distortion is via operator adjustment on the 3735 operator panel. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Submit an RPQ for operation on a basic 3002 channel. Multipoint Data Link Control (#5010). **Limitation:** Cannot be installed with Synchronous Clock (#7705), 1200 BPS Integrated Modem (#5500 or #5501), or 2400 BPS Integrated Modem (#5600 or #5610). All tributary stations in the multipoint centralized network must be equipped with 2400 BPS Integrated Modem, Multipoint or the IBM 3872 Modem with Multipoint Tributary (#5101 or #5102). The master station may be equipped with the IBM 3872 Modem-Basic.

2400 BPS INTEGRATED MODEM, SWITCHED (#5610). An integrated self-clocked modem for 2400 bps operation over the switched telephone network facilities. Automatic answer and manual half-speed capability are standard with this feature. Auto-

matic equalization is effected at the beginning of each call. Attachment to the network is via common carrier Data Access Arrangement Type CBS, or equivalent. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with Synchronous Clock (#7705), Multipoint Data Link Control (#5010), 1200 BPS Integrated Modem (#5500 or #5501), 2400 BPS Integrated Modem (#5600 or #5602), or Switched Network Backup (#7951). This modem is compatible with the IBM 3872 Modem equipped with Switched Network-Basic (#7941) or Switched Network-Second (#7942). In addition, this modem may communicate with a 3872 modem equipped with Switched Network Backup (#7951 or #7952). The control station may be equipped with Automatic Call Originate (#1091).

SYNCHRONOUS CLOCK (#7705). A synchronous clock for use with 1200 BPS Integrated Modems or data sets which do not have an internal clock. The device with which the 3735 is to communicate with must also have an internal clock operating at the same bps rate. **Field Installation:** Yes.

3286 PRINTER MDL 3 ATTACHMENT (#7880). To attach a 3286 Printer mdl 3 (66 cps). A 3735 with EBCDIC Transmission Code (#9761) requires a 3286 mdl 3 with EBCDIC Character Set (#9089). A 3735 with ASCII Transmission Code (#9762) requires a 3286 mdl 3 with ASCII Character Set (B) (#9092). **Maximum:** One. **Field Installation:** Yes. See "Customer Storage/Feature Table" under "Highlights."

SWITCHED NETWORK BACK-UP (#7951). Provides the capability of attaching the 2400 BPS Integrated Modem, Multipoint (#5602) or the 2400 BPS Integrated Modem, Point-to-Point (#5600) to the switched telephone network as a back-up to the prime leased facility. A fixed compromise equalizer is provided for back-up operation. Attachment to the switched telephone network, is made via the common carrier Data Access Arrangement Type CDT, or equivalent. Calls on the switched network must be established and answered manually. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** 2400 BPS Integrated Modem (#5600 or #5602). **Limitations:** Cannot be installed with 2400 BPS Integrated Modem, Switched (#5610) or with 1200 BPS Integrated Modem (#5500 or #5501). For OS/DOS BTAM programming considerations at the CPU, refer to Switched Network Back-up under 3872 and Appendix "C" of IBM 3872 User's Guide, GA27-3058.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC
Additional Customer Storage			
1st Increment	#1001 \$ 33	\$1,035	\$1.00
2nd Increment	1002 33	1,035	1.00
3rd Increment	1003 77	2,425	3.00
Buffer Expansion	1450 28	867	3.00
496 Attachment	3950 28	867	1.00
File Storage Capability	4001 13	416	1.50
Operator Identification			
Card Reader	4600 16	520	4.00
Keylock	4695 35SUC	35	NC
Multipoint Data Link Control	5010 16	520	1.00
1200 BPS Integrated Modem	5500 16	535	3.50
1200 BPS Integrated Modem, Switched w Auto Answer	5501 21	714	4.00
2400 BPS Integrated Modem			
Point-to-Point	5600 70	1,905	13.50
Multipoint	5602 77	2,115	16.00
Switched	5610 78	2,170	16.00
Synchronous Clock	7705 16	520	1.00
3286 Printer Mdl 3 Attach	7880 16	520	1.00
Switched Network Back-up	7951 10	303	4.00

Accessories: The following items are available on a purchase only basis. For shipment with machine, order the Feature # indicated below, or Part No. shown in M 10000 pages, at the price listed in M 10000 pages. See M 10000 pages for additional information and field installation.

FORMS STAND (#4450) -- Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

PIN FEED PLATEN (#9509) -- In lieu of standard friction feed platen. **Maximum:** One. See M 10000 pages for available options and additional #s to be specified. **Limitations:** Only 6 lines/inch spacing is available. Maximum width pin feed platen which can be used is 13-1/8" hole-to-hole.

Forms Guide/Roll Paper Holder -- an accessory that provides guide for continuous forms or for mounting rolls of paper. Includes a tear bar. Interchangeable with the vertical form guide which is standard on the 3735. Available for field installation only.



DP Machines

3791

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IBM 3736 PRINTER

Purpose: Provides hard copy output for the 3730 Distributed Office Communication System.

Highlights: The 3736 Printer is a bidirectional, serial impact printer used with the 3730 Distributed Office Communication System. The printer is mounted in a desk-high work station that contains the printer control electronics and power supplies. The work station has a knee hole to allow the user to sit at the printer while performing operations such as changing the paper or the print ribbon. To reduce noise, the printer has an acoustic hood.

The 3736 prints on single sheets (cut forms) or on continuous stationery, using a maximum of one original plus five carbon copies. An end-of-form sensor indicates when the printer is out of continuous stationery.

Friction paper feed is standard for single sheets. For feeding continuous stationery, a variable-width forms tractor (#8750) is available as a special feature. In addition, a paper stacker/tray (#5545) and a paper carrier (#5540) are available as accessories for use with continuous stationery. The variable-width forms tractor and the two accessories are necessary for optimum feeding of a wide range of continuous stationery. The variable-width forms tractor alone permits satisfactory feeding of only a limited range of continuous stationery.

Printer Characteristics:

- Uses interchangeable 96-character print wheels in the following type styles:

Courier 10	10-pitch
Prestige Pica	10-pitch
Prestige Elite	12-pitch
Letter Gothic	12-pitch
- Prints at up to 55 characters per second.
- Prints at six line per inch (single line spacing).
- Uses 3736 film ribbon. An end-of-ribbon sensor indicates when the print ribbon needs replacing.

Paper Characteristics:

- The maximum paper width is 381mm (15 inches), with a maximum writing line of 330mm (13 inches). The maximum paper thickness is 0.6mm (0.025 inches).
- For specifications of forms that can be used on the 3736, see *Form Design Reference Guide for Printers*, GA24-3488.

Attachment to Controller: The 3736 attaches to a 3791 Controller mdl 11C, 12A or 12B via a coaxial cable at a distance of up to 609 meters (2,000 feet).

PREREQUISITES: 3791 Controller mdl 11C, 12A or 12B with Configuration Support #9171 installed. Refer to 3791 in "Machines" for details.

Attended Operation: The 3736 is designed for attended operation: that is, operator intervention may be required from time to time while the 3736 is in use. The 3736 must not therefore be left unattended for long periods at a time, and should not be left running unattended overnight.

Problem Determination Procedures: To minimize machine downtime, users are encouraged to determine the cause of 3736 malfunctions using IBM-provided Problem Determination Procedures. Data obtained from these procedures is used to correct customer operating or programming errors, or is passed to a customer engineer to aid in isolating a machine malfunction. The Problem Determination Procedures are presented in an easy-to-follow graphic form and are contained in the *3736 Operating Instructions* (GA33-3027), and also in the *Problem Determination Guide for the 3732 Text Display Station* (GA33-3024) (stored in the 3732 keyboard).

Publications: Refer to the latest level of *IBM System/370 Bibliography of Industry Systems and Application Programs*, GC20-0370, for details of 3736 publications and 3730 system publications.

Specify: [1] Voltage (120V AC, 1-phase, 3-wire, 60 Hz): **#9891** for non lock plug.

[2] Cables: See M10000 pages for cable prices and ordering instructions. For cable specifications, see *3790 Communication System Installation Manual - Physical Planning*, GA27-2769.

[3] Print Wheel Character Set: Specify one of the following: -- **#9082** for EBCDIC character set (word processing), or **#9084** for ASCII character set (B).

[4] Print Wheel Typestyle: Specify two of the following:

Prestige Pica	10-pitch	#9471
Courier - 10	10-pitch	#9472
Prestige Elite	12-pitch	#9474
Letter Gothic	12-pitch	#9475

NOTE: Two print wheels of each selected typestyle will be shipped with the 3736 printer.

IBM will replace worn or damaged IBM print wheels at no charge to the customer on IBM 3736 machines covered by an IBM Lease, Rental, or Maintenance agreement provided that the wear or damage is due to normal machine usage. Replacement will only be made with an IBM print wheel of the same specifications.

PRICES:	mdl	MRC	MLC 2 yrs	Purchase	MMMC
	3736	1	\$250	\$213	\$7,455 \$ 82

Plan Offering: Plan B Warranty: B Machine Group: D
Purchase Option: 55% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5% Customer Set-Up: No

SPECIAL FEATURES

VARIABLE-WIDTH FORMS TRACTOR (#8750). Feeds continuous forms up to a maximum width of 368mm (14.5 inches). Maximum: One. Field Installation: Yes.

Special Feature Prices:	MRC	MLC 2 yrs	Purchase	MMMC
Variable-Width Forms Tractor	#8750	\$250SUC	- \$ 250	N/C

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the feature number indicated below at the price listed in the M10000 pages. For all other orders, see M10000 pages.

PAPER STACKER/TRAY (#5545) -- Holds fan-fold continuous form paper and stacks the paper as it leaves the printer.

PAPER CARRIER (#5540) -- Guides the paper onto the paper stacker/tray as the paper leaves the printer. The paper carrier also has a tear-off blade and rod to hold continuous roll paper.

ADDITIONAL PRINT WHEELS -- Additional print wheels for typestyles required other than the two specified with the 3736 order should be ordered as accessories.

SUPPLIES:

PRINT RIBBON -- Use IBM 3736 film ribbon, IBM Part No. 1299060 or equivalent

NOTE: It is the customer's responsibility to purchase print ribbons, and to ensure that they are available in time for machine installation.

**3760 DUAL KEY ENTRY STATION (Models 1 and 2)
3760 KEY ENTRY STATION (Model 3)**

Purpose: Used to key data onto the 3791 Controller disk. The disk in the 3791 is used as a data storage medium prior to transmission of batched data by channel or SDLC communications facilities to any virtual storage S/370 or 4300 Processor. Data extraction can be done by diskettes.

- Model 1** A Dual Key Entry Station ... Display Panel ... attaches to the 3791 with Device Attachment Type I (#7900) or Device Attachment Type I, Additional (#7922).
- Model 2** Same external appearance as Model 1. The first Model 2 is attached to Model 1 via 3760 Model 2 Attachment (#7920). The second Model 2 is attached to Model 1 via a second 3760 Model 2 Attachment (#7920).
- Model 3** A single Key Entry Station ... Display Panel. Has same functional characteristics as model 1. Attaches to the 3791 with Device Attachment Type I (#7900) or Device Attachment Type I, Additional (#7922). Can be optionally attached to up to four 3791 Controllers simultaneously with the capability to switch between them. 3760 mdl 2s cannot be attached.

Model Changes: Model conversions cannot be made.

Highlights: Model 1 and Model 2 -- each physical station provides two keyboard operator positions each with keyboard and display panel area. Model 3 -- provides one operator position with keyboard and display panel area.

Has buffered storage area into which data is keyed prior to recording on the 3791 disk storage thus allowing for correction of detected errors before record is stored. Formats control the automatic functions of skipping, duplicating, editing, etc. Modes of operation are under keyboard control.

For systems capabilities, see 3790 Communication System/Data Entry Configuration in 3790 "Systems" pages.

Keyboard -- has a standard 66 character alphanumeric combination keyboard with "EL" character set for key entry and verifying. In addition to standard keys, the keyboard has: Record-Field-Character Backspace ... Field-Character Advance ... Auto Skip/Dup and Auto Enter Key Switch ... Display Record ... Next Format ... Record Position ... Insert and Delete ... Cursor Up and Down ... Cursor Placement at Command Line ... Mark Record and Scan Next Record Keys. Command Keys (#9079) are provided as a Specify feature. Optionally available are ASCII Keyboard and proof arrangements of both the EBCDIC and the ASCII keyboards.

Display Panel -- up to 236 characters can be displayed to each operator ... six rows of 40 positions each ... first row is the Command Line on which messages, commands, error types, and mode of operation are displayed ... rows two thru six display keyed data as it is entered ... a fill-in-the-blanks format may be displayed and as data is entered the cursor will automatically skip over the indicative format data ... Status Indicators ... on the left and right side of the panel ... left side indicators are; Operator Attention, Auto Skip/Dup, Display Record, Auto Enter, and Verify Mismatch ... right side indicators are; Operator Attention, Station Available, Enter, Verify, Insert Mode and Dup Not Allowed.

PREREQUISITES:

For 3760 Model 1 and Model 3 -- 3791 Controller with Device Attachment Type I (#7900) or Device Attachment Type I Additional (#7922), Additional Disk Heads (#3220, 3221), Control Storage Extension (#1590), and one or more Control Storage Increments (#1602, 1612).

For 3760 Model 2 -- 3760 Model 1 with 3760 Model 2 Attachment (#7920).

For details, see M 3791 pages.

Bibliography: GC20-0370

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking Plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock Plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V. NOTE: Model 1 and the two attached Model 2s require the same power specifies.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. NOTE: Color accent is provided on the knee panel only and may be any of the above colors ... Top and Side panels will always be white.

[3] Cables: See M 10000 pages for 3760 cable prices and ordering instructions. For cable specifications see SRL Physical Planning Manual for 3790 System, GA27-2769.

[4] Keyboard Arrangements: EBCDIC is standard. If required,

specify #9393 for ASCII.

Proof versions have the alphanumeric keyboard with a numeric key arrangement similar to that of an adding machine.

All 3760 model 2s will have the same arrangement as the attached 3760 mdl 1. If required, specify:

#9425 for proof keyboard, ASCII
#9426 for proof keyboard, EBCDIC

Prerequisite: Storage Extension (#7115) (mdl 1 only) and Configuration Support #9175 or #9195 on the 3791.

[5] Command Keys: #9079. Provides, through the command key at the left side of the space bar, the ability to issue commands -- HELP ... COPY ... FLAG ... ACCEPT ... RETURN ... CONTINUE SEARCH ... SAVE ... FORMAT DISPLAY ... by pressing the command key first and then the appropriate top row key of the keyboard. A sticker on the keyboard cover, just above the top row, identifies the command functions of the keys. **MAXIMUM:** Two per 3760 mdls 1 and 2 ... one per mdl 3. **FIELD INSTALLATION:** Yes. **PREREQUISITE:** Storage Extension (#7115) on the 3760 mdl 1.

[6] Conditional Display: #9220. This option may be specified to prevent keyboard overrun in some situations.

The function works on all operator positions attached to the model 1 with this feature. **Maximum:** One per 3760 mdl 1. **Field Installation:** Yes. **Prerequisites:** Storage Extension (#7115) (mdl 1 only) and Configuration Support #9175 or #9195 on the 3791.

PRICES: Mdl		ETP/ MLC		Purchase	MMMC
		MAC/ MRC	2 yr		
3760	1	\$ 259	\$ 220	\$9,240	\$49.50
	2	141	120	5,040	35.00
	3	188	160	6,770	43.50

Plan Offering: Plan B Warranty: B Machine Group: D
Purchase Option: 45% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES

SECURITY KEYLOCK (#6350). [Mdl 1, 3 only] A key operated switch. When the switch is in the "locked" position, entry of data into the 3760 mdl 1s, mdl 3s, and all mdl 2s attached to mdl 1s is prevented. **Field Installation:** Yes. **Note:** For additional and/or replacement keys, see M 10000 pages.

SELECTOR SWITCH (#6660). [Mdl 3 only] Provides a four position rotary switch, allowing a 3760 mdl 3 to be switched between up to four 3791 Controllers. **Maximum:** One per 3760 mdl 3. **Field Installation:** Time of manufacture only. **Prerequisite:** Security Keylock (#6350).

STORAGE EXTENSION (#7115). [Mdl 1 only] Provides additional storage in 3760 mdl 1, permitting installation of Command Keys (#9079), Proof Keyboard #9425 or #9426 on the 3760 mdl 1 and 2, and Conditional Display #9220 on the 3760 mdl 1. **Maximum:** One per 3760 mdl 1. **Field Installation:** Yes.

3760 MODEL 2 ATTACHMENT (#7920). [Mdl 1 only] To attach one 3760 mdl 2 to a 3760 mdl 1. **Maximum:** Two (#7920) per 3760 mdl 1. **Field Installation:** Yes.

Special Feature Prices:		ETP/ MLC		Purchase	MMMC
		MAC/ MRC	2 yr		
Security Keylock	#6350	\$ 35	\$ 20	\$ 35	NC
Selector Switch	6660	24	20	864	\$7.50
Storage Extension	7115	16	14	329	2.50
3760 Mdl 2 Attachment	7920	12	10	420	.50



3791

IBM 3762 PAYMENT TRANSACTION PROCESSOR

Purpose: To process payment transactions by scanning OCR-A encoded data from turn-around documents (stubs), validating keyed-in payment amounts and storing selected payment information onto the disk in the 3791 Controller, to which the 3762 attaches. One-step processing is achieved with the appropriate special features, producing proper batches of inscribed and endorsed checks for deposit in the bank with user-specified audit trail information, complete with deposit ticket and journal tape listing. A storage extension feature allows handling of agent transactions, user programmable subroutines, OCR-B, 1428 and .095" Standard 1403 fonts.

Highlights: A 3762 provides two operator positions, each equipped with a keyboard, a 240 character display, a document transport and a scanner to read one line of up to 60 machine printed numeric digits in either OCR-A, OCR-B, .095" Standard 1403 or 1428 font (OCR-A is standard, other fonts require the Storage Extension feature). The appropriate recognition logic is loaded into the 3762 automatically; different OCR fonts can be used by different 3762s in one 3790 Communication System/Data Entry Configuration simultaneously but the two operator positions on one 3762 must use the same font. Documents are entered by hand into the document entry slot in front of the operator. They are transported under machine control past the OCR read station which incorporates a solid state scanning device to collect character images. These images are analyzed and recognized within the 3762 recognition and control processor.

The "Table of Acceptable Characters and Printing Devices" below shows the characters which are acceptable from typewriters, highspeed printers and offset printing using the designated font. Non-recognized OCR data as well as the payment amount can be entered by the operator via the keyboard. After (user-specified) editing and checking of the data entered, the amount paid is checked for acceptability (according to user-specified criteria). The output record is subsequently prepared and transferred to the attached 3791 Controller for intermediate storage on the 3791 disk. Special features include audit trail printing on stubs, checks and deposit tickets, E13B inscribing of checks and deposit tickets, endorsing of checks, and journal tape printing of the amounts processed. Printing is under program control.

Table of Acceptable Characters and Printing Devices

	OCR-A	OCR-B (6)	.095" Standard 1403 (1, 6)	1428 (6)
Digits	0 - 9	0 - 9	0 - 9	0 - 9
Delimiters	Hook Fork Chair LVM (2) Double Blank (3) Single Blank (4) Margins (5)	< > LVM (2) Double Blank (3) Single Blank (4) Margins (5)	- LVM (2) Double Blank (3) Single Blank (4) Margins (5)	- LVM (2) Double Blank (3) Single Blank (4) Margins (5)
Printers	Selectric® 1403 3203 3211 3800 Offset	Selectric® 1403 3203 3211 3800 Offset	1403 3203 3211	1403 3203 3211

NOTES:

- (1) Also called 407-I font. Train arrangements must have suffix 2, e.g., HN2.
- (2) The LVM is a pre-printed vertical line, 3.70 mm (0.145") minimum height, centered in the print band, having the normal character stroke width and occupying a full character space.
- (3) A Double Blank is a blank space of at least 4.3 mm (0.170"). Single and double blanks may not be specified intermixed in one code line.
- (4) A Single Blank is a blank space of at least 2.3 mm (0.090") and less than 4.3 mm (0.170").
- (5) The Right and Left Margin are each 6.35 mm (0.250") wide.
- (6) The OCR-B, .095" Standard 1403 and 1428 fonts can only be recognized when the Storage Extension feature is installed.

The 3762 can process single-stub, multi-stub and agent transactions. Agent transactions require the Storage Extension special feature. A transaction may contain one or more checks. All data entry operating modes available for the 3760 Dual Key Entry stations are also available on the 3762 Payment Transaction Processor. For details, see 3760 Machines pages. Moreover, 3760 operations such as updating of a customer's address can be

performed intermixed with payment transaction processing. For system capabilities, see "3790 Communication System/Data Entry Configuration" in "3790 Communication System" pages. GA33-4570 gives the Introduction and GA33-4571 gives the Functional Description of the IBM 3790 Communication System using the 3762.

Keyboard -- has a standard 66 character alphanumeric combination keyboard with EL character set for key entry (and verifying in 3760 mode). In addition to standard keys, the keyboard has: Record-, Field-, and Character-Backspace ... Field-Character-Advance ... Auto Skip/Dup and Auto Enter Key Switch ... Display Record ... Next Format ... Record Position ... Insert and Delete ... Cursor Up and Down ... Command Line and Command ... Mark Record ... Hex/Alternate ... Scan Next Record ... and PF keys ... Use of the top row of keys as command keys for the following twelve commands is standard: HELP, COPY, FLAG, ACCEPT, RETURN, CONTINUE SEARCH, SAVE, FORMAT DISPLAY, TOTAL, CHECK, NOTICE* and PURGE.

* Only active with Agent Processing.

Optionally available are ASCII keyboard, and Proof arrangements of both the EBCDIC and the ASCII keyboards. The Proof keyboard modifies the standard keyboard to provide a numeric key arrangement similar to that of an adding machine. See Specify below for details.

Display Panel -- up to 236 characters can be displayed to each operator on six rows of 40 positions each ... first row is the Command Line on which entered commands, messages, error types, and mode of operation are displayed ... data entered may be displayed on rows two through six ... a fill-in-the-blanks format may be displayed and the cursor will automatically skip over the prompting information as data is entered ... Status Indicators ... on the left and right side of the panel ... left side indicators are: Operator Attention, Auto Skip/Dup, Display Record, Auto Enter, and Verify Mismatch ... right side indicators are: Operator Attention, Station Available, Enter, Verify, Insert Mode and DUP Not Allowed ... as on the 3760. A special format screen is displayed for payment transaction processing.

Transport -- contains an entry slot, a document transport mechanism, a pocket selector and two pockets ... documents are handled. Documents move from the entry slot past the scanner to the pockets. The transport accepts stubs ranging from 76.2 to 152.4 mm (3.0 to 6.0") high and 69.85 to 222.25 mm (2.75 to 8.75") long, provided the height/length ratio is 1.4:1 or less, and checks with standard ABA check sizes. Allowable weight ranges from 16 to 32 lbs and card stock. For details, see 3762 Paper and Printing Requirements, GA33-4576.

Scanner -- consists of four lamps, a lens, and a linear array of 64 photodiodes and is located in the transport. Its vertical position is operator settable to the appropriate position of the codeline of printing to be scanned on the document. For details on permissible codeline locations see 3762 Paper and Printing Requirements, GA33-4576.

Pockets -- provided are two document pockets with a depth of 44.4 mm (1.75") each. Stubs and checks are automatically selected to the two pockets.

Documents and Printing -- the input documents and printing must conform to the specifications described in 3762 Paper and Printing Requirements, GA33-4576. Ribbons and background inks meeting the outlined criteria will give good performance. For Film Ribbon Selectric -- Part No. 1136310 or 1136391 ... for Fabric Ribbon Selectric -- 1136138 ... for 1403 (mdl 2 and N1) -- 1136430, 414486 and 424325 ... for 3211 ribbon 1136626 or 1136627 ... for 3203 (mdls 1, 2 and 3) -- 1136430. Ribbons not having similar characteristics may result in reduced recognition performance. The IBM 3762 Document Gauge can be ordered as GX33-8505.

Document Tray -- two document trays are provided with every 3762, one for each operator position. The document tray can be used by an operator to hold the stack of stubs and checks to be entered. For additional or replacement document trays, see M 10000 pages.

PREREQUISITES: In 3791 -- Controller Device Attachment Type I (#7900) and Device Attachment Type I, Add'l (#7922) depending upon the number of units attached, Add'l Disk Heads (#3221), Control Storage Expansion (#1590), and Control Storage Increments (#1603, #1613) as required. For details, see M 3791 pages. Configuration guidelines are given in GA33-4572.

Bibliography: GC20-0370

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. NOTE: Color accent is provided on the knee



3762 Payment Transaction Processor (cont'd)

panel only and may be any one of the above colors ... top and side panels will always be white.

[3] Cables: See M 10000 pages for 3762 cable prices and ordering instructions. For cable specifications, see SRL Physical Planning Manual for 3790 Systems, GA27-2769.

[4] Keyboard/Language Arrangements: Proof versions have the alphameric keyboard with a numeric key arrangement similar to that of an adding machine.

- #9420 for ASCII
- #9421 for EBCDIC
- #9423 for Proof Keyboard (ASCII)
- #9424 for Proof Keyboard (EBCDIC)

NOTE: All 3762 stations attached to the same 3791 Controller must have the same keyboard/language arrangement. The Proof version may be intermixed with the Non-Proof version in a 3790 system but not in the 3762 unit.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3762	1	\$1,410	\$1,200	\$50,400	\$220

Plan Offering: Plan B Warranty: B Machine Group: D
Purchase Option: 50% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES

AUDIT TRAIL PRINTERS (#1310). This feature consists of two matrix print devices, one in each transport. It prints 7 x 7 dot characters with a pitch of 8.5 characters per inch ... a maximum of 40 print positions on one line. Printing is on the back of the documents starting at 3.0 mm (.12") from the leading edge, on stubs, checks and deposit tickets, centered 66.5 mm (2.62") from the bottom edge. Fields to be printed on stubs and checks are selected by the user during format definition (not for Deposit Tickets). The character set consists of 10 digits, 26 letters, 7 symbols and blank. **Supplies:** Cartridge ribbon Part No. 1136970 or equivalent. **Field Installation:** Available at time of manufacture only.

ENDORERS (#3805). This feature consists of two endorsing stations, one in each transport. It prints a user designed endorsement legend on the reverse side of the checks. The maximum size of the legend is 28 x 33 mm (1.1 x 1.3"). The user can specify the horizontal endorsement position close to the leading or the trailing edge during format definition. **Supplies:** Endorse Plates -- for ordering, **Specify:** Endorser ink roll -- #9145 for black, #9146 for green, #9147 for purple, and #9148 for red. **Field Installation:** Available at time of manufacture only.

JOURNAL TAPE PRINTERS (#4660). This feature consists of two journal tape print devices, one for each operator. It lists the check amounts processed within a deposit and the deposit total as well as the appropriate deposit identification. When processing agent transactions the individual stub amounts are printed. With the individual amounts, a three digit item identification number is printed in italics in the three leftmost character positions. The two rightmost positions are reserved for a code that identifies the printed line. In total 15 character positions are available. The printed tape is within reach of the operator for tear off at completion of the deposit. **Supplies:** Ink ribbon -- recommended material Nylon or Vinyon fiber (FF40). Spool diameter 35.1 mm (1.38"). Spool type -- standard only, ribbon width 12.7 mm (.5"), length 6096 mm (240"), Part No. 1299087 (black) or equivalent. Journal Tape -- single or two-ply width 57.2 mm (2.25"), roll diameter 81.0 mm (3 and 3/16") max. Single-ply -- recommended paper weight 16 lbs @ 5% (approx. 60 gr/m²), tape has to be colored through the last 1.8 m (6 feet) approx., Part No. 457297 or equivalent. Two-ply -- recommended paper weight 16 lbs @ 5% (approx. 60 gr/m²) per ply, tape has to be colored through the last 1.8 m (6 feet) approx., Part No. 457298 or equivalent. **Field Installation:** Available at time of manufacture only.

MICR INSCRIBERS (#5100). This feature consists of two MICR (E13B) inscribing units, one in each transport. It encodes the amount on checks of acceptable transactions. At the users option it encodes in the same pass, amount, process control, account number and transit routing fields on deposit tickets. All fields are encoded in accordance with the Bank Check Specifications for MICR, ANSI X3.3-1970. **Supplies:** MICR ribbon Part No. 431555 or equivalent. A MICR gauge is available for checking inscriber output registration. Order part number 451128

Field Installation: Available at time of manufacture only.

SECURITY KEYLOCK (#6350). A key operated switch ... one per 3762. When the key is in the "locked" position, entry of data via a scanner or a keyboard is prevented. Automatic Re-IMI occurs when unlocking. **Field Installation:** Yes. **Note:** For additional

and/or replacement keys, see M 10000 pages.

STORAGE EXTENSION (#7500). This feature provides a 8K byte storage extension in the 3762. It must be installed when processing agent transactions ... applying user programmable subroutines ... 1428, OCR-B .095" Standard or 1403 numeric font recognition is required. Only one type font can be recognized in the 3762 at any one time, but different 3762s may recognize different fonts. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC	
Audit Trail Printers	#1310	\$165	\$140	\$5,880	\$26.50
Endorsers	3805	41	35	1,470	3.50
Journal Tape Printers	4660	157	134	3,990	47.00
MICR Inscribers	5100	241	205	8,610	13.00
Security Keylock	6350	35SUC	—	35	NC
Storage Extension	7500	81	69	2,337	10.50



IBM 3767 COMMUNICATION TERMINAL

Purpose: A keyboard/printer terminal for transmission of data or text to or from a virtual storage S/370 or 4300 Processor via a 3704 or 3705 Communications Controller, to a 4331 via its Communications Adapter feature, or to the 8100 Information System via the 8130, 8140 and/or 8101. The 3767 uses Synchronous Data Link Control (SDLC) line discipline.

- Model 1** 40 cps average bi-directional printer.
- Model 2** 80 cps maximum bi-directional printer; includes dual 256 byte line buffers and full buffer editing capability.
- Model 3** 120 cps maximum bi-directional printer; includes dual 256 byte line buffers and full buffer edit capability.

NOTE: Throughput on all models is dependent upon output format, line control, buffering, and transmission speed.

Highlights: The 3767 consists of control functions, printer, keyboard, control keys and indicator lights in one integrally designed desk-top unit. This configuration allows an operator/machine relationship that is favorable for both interactive and batch operations. Special features are available which permit tailoring of the terminal to the user's requirements.

Control Functions: Provides the control for all on-line and off-line operations; facilitates communications at speeds up to 2400 bps in SDLC line discipline and controls single line data editing on the base model 1. It also controls, on all models, basic functions such as Automatic Terminal I. D., Station Control, Internal Communications Clocking, Transmit and Receive Interrupt, End of Line Alarm, Buffer Full Alarm and Auto (EOB/EOM) switch.

Printer: [Model 1 and 2] Maximum printer throughput is obtained with bi-directional serial matrix printing and indexing without unnecessary print head movement. Electronic tabbing over the full 132 printable positions is provided. The printer dot matrix is 4 of 7 wide by 8 high giving high legibility with character spacing at 10 to the inch. Line spacing is 6 lines to the inch. Up to 6 part forms (total thickness -- 0.018") may be used. For any multi-part or pre-printed continuous forms the Variable Width Forms Tractor (#8700) is recommended. Five and six part continuous forms should be tried on an individual basis for acceptable feeding, registration, and print quality. Single part continuous or up to four part cut forms can be used with the standard friction feed platen. The Paper Roll Holder and Forms Guide with paper bail (#9180) is available for use with roll paper and is recommended for use with single part fan-fold paper when the Variable Width Forms Tractor (#8700) is not used. Maximum overall forms width is 15"; card stock forms are not recommended. (See GA24-3488 for form specifications and limitations.)

Printer: [Model 3] Same as model 1 and 2 with the exception that forms tractor is required for all continuous forms.

Keyboard: Provides several keyboard arrangements and includes typamatic on hyphen, underscore, backspace and space keys. In addition to the standard 44 alpha/numeric data keys, are function keys, indicator lights, operating mode switches, and a 3-position numeric "print position indicator" display to aid the operator.

Security Enhancement Features: Print Suppress allows selected data fields to be entered without being printed. The Security Keylock (optional) with the power switch "ON" allows the 3767 to be operational.

The Magnetic Stripe Reader (optional) is provided to allow operator identification to be transmitted.

Communications Facilities: The 3767 operates in half-duplex mode over facilities C3, C4, C5, D2, D3, D4 or X1M ... for details concerning these facilities, see M 2700 pages.

Synchronous Data Link Control: Allows for transmission rates of 600, 1200 or 2400 bps.

The 3767 can communicate on a switched or non-switched point-to-point facility or as a secondary station on a multipoint or duplex multipoint facility to a virtual storage S/370, a 4300 Processor, or non-switched point-to-point or multipoint on the 8100 Information System.

Modems: One Integrated Modem or External Modem can be used. See "Special Features" for options. Synchronous clock is a standard feature.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the operator. See *IBM 3767 Operator's Guide*, SRL GA18-2000, and Customer Responsibility below.

Customer Responsibility: The customer is responsible for:

- unpacking, placement, set-up and checkout of the 3767 at time of delivery, or when relocating the 3767.
- removal and packing of the 3767 at time of discontinuance.
- relocation of the 3767 (if required) to allow IBM service access.
- to use and follow the Problem Determination Procedures and fill out the Trouble Report prior to calling for service.

See M 2700 pages for additional responsibilities.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Supplies: A black ribbon, IBM Part No. 1136653 or equivalent, is required.

For details and prices, see M 10000 pages.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Keyboard Arrangement: #9381 for Correspondence, or #9391 for EBCDIC.

[3] SDLC Speed Selection: #9533 for C5/D4 (2400 bps); #9532 for C4/D3 (1200 bps); #9531 for C3, D2 (600 bps). See "Special Features" for modems and modem attachments.

[4] Integrated/External modem cable: A 20 foot cable is provided as standard. If a longer cable is required, specify #9021, indicating length in feet as a quantity of 25, 30, 35 or 40.

[5] 6 Foot Power Cord: Specify #9986, otherwise a 10 foot power cord will be provided.

[6] Variable Width Forms Tractor Covers: Specify #9850 if Variable Width Forms Tractor (#8700) is ordered.

[7] For Model 1 and 2 Only: Paper Roll Holder and Forms Guide with Paper Bail (#9180) must be ordered on all machines without Variable Width Forms Tractor Covers (#9850). A customer using the Variable Width Forms Tractor has the option of ordering specify feature #9180 at no additional charge, once per machine, for friction feeding of single part continuous roll and fan fold paper. Specify feature #9180 is used interchangeably with the Variable Width Forms Tractor and is attached and removed by the customer. The Paper Roll Holder and Forms Guide with Bail is not available for the 3767 mdl 3.

[8] SNA Terminal Address: #9587 must be specified on all orders -- supplemental specs available for giving one EBCDIC byte address. Any two "Hex" characters, excluding "00" and "FF" may be used.

[9] Blower: #9030. Must be specified for 3767 (mdl 1 or 2 only) expected to operate in an environment above 90° F ambient temperature (specification limits up to 105° F).

[10] Paper Tear Bar: [Model 1 or 2 only] #9422. A device for tearing continuous forms. Prerequisite: Paper Roll Holder and Forms Guide with Paper Bail (#9180).

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 year	Purchase	MMMC
3767	1	\$ 176	\$ 150	\$ 5,800	\$45.50
	2	223	190	6,650	51.50
	3	276	235	8,225	74.50

Plan Offering: Plan B Purchase Option: 60% Machine Group: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Can be made in the field.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

- From Model 1 to Model 2 \$850.
- From Model 1 to Model 3 \$3,150.
- From Model 2 to Model 3 \$2,300.

SPECIAL FEATURES

The following Special Features apply to the 3767 mdls 1, 2, 3.

Note: Customers who elect to purchase one of the features* listed in Group #1 or Group #2 and later order additional features within that group should consider purchase of all features initially because these field upgrades require replacement of the initial feature and installation of the new combination.

* Except when Vertical Forms Control (#8731) has previously been installed and the Magnetic Stripe Reader (#4930) is the additional feature being ordered.

Group #1 Vertical Forms Control (#8731), Magnetic Stripe Reader (#4930), Calculate-Scientific (#1572).

Group #2 Start/Stop Feature -- 2740-1 (#7111), -- 2740-2



3767 Communication Terminal (cont'd)

(#7112), - 2741 (#7113), Alternate Character Set (#1291), Buffer with Edit - 512 (#1481), Buffer with Edit - 1,024 (#1482).

ACOUSTIC COUPLER - 600 BPS (#1110). Provides an acoustic coupler for communications through a telephone handset at speeds up to 600 bps. Requires a 1200 bps Integrated Modem on host end of communications facility. **Maximum:** One. **Field Installation:** Yes. Customer will set up at time of 3767 delivery - FE will install if ordered. **Prerequisites:** 1200 bps Integrated Modem (#5502 or #5506); 600 bps (#9531), in addition, if Start/Stop Feature (#7111 or #7113) is ordered, 300 bps (#9540). **Note:** For limitations on Public Switched Network, consult M 2700.1 page and "Notes for Chart C" note [14] in M 2700 pages.

ASCII FEATURE (#1201). Provides ASCII Keyboard (48 Key) and graphics in lieu of those normally provided by Keyboard Specify Codes. **Maximum:** One. **Field Installation:** Not recommended for field installation. **Limitations:** Cannot be installed with Start/Stop Features (#7111, 7112, 7113), Alternate Character Set (#1291), or Keyboard Arrangement #9381 (Correspondence) or #9391 (EBCDIC).

ALTERNATE CHARACTER SET (#1291). Provides a switch control for alternate printed graphics, to those selected by the keyboard specification. Compatible with Start/Stop Feature #7113 (2741) and #7111 (2740-1). Only specify codes #9394 and #9395 (EBCDIC-Mono) are compatible with #7112 (2740-2). Keypoint engraving remains the same. Key front decals will be provided for easy operator reference in using this feature. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with ASCII Feature (#1201).

3767 Chart A

Keybd	Alt. Char. Set	SDLC				START/STOP				Keybd Prereq. Specify Code	Select Only One (1)	
		Graphics		Data Code	Graphics	Line Code	P T T C / E B C D					
		C O R R E S	E B C D I C	M O N O (2)	E B C D I C	C O R R E S	E B C D I C	M O N O (2)	C O R R E S			
Corres.	EBCDIC APL	X	X		X	X	X		X	#9381		#9382 #9383
EBCDIC	Corres. APL Mono (3) Mono (4)	X	X		X	X		X	X	#9391		#9392 #9393 #9394 #9395

- (1) Alternate Character Set (#1291) is a prerequisite.
- (2) Sub-set of EBCDIC.
- (3) Upper case alpha printed from keyboard - upper/lower case may be printed from the communications line.
- (4) Upper case alpha printed from keyboard or the communications line regardless of key shift or line code shift.

BUFFER WITH EDIT (#1481, 1482). #1481 [Mdl 1 only] provides two 256 byte buffers for receiving data. #1482 [Mdl 1, 2 or 3] provides two additional 256 byte buffers for receiving data. On key entry these two features provide full buffer (up to 512 or 1,024 bytes) edit capability under key control. With the Edit switch "off", a single data line may be transmitted. When used with 2740 mdl 2 Start/Stop Feature (#7112) single buffer (120-248-440 byte) operation is provided. The Buffer Full Alarm warns the operator 10 positions before full capacity. **Maximum:** One each. **Field Installation:** Yes. **Limitation:** This feature not active if Start/Stop Feature (#7111 or #7113) is active. A 512 buffer (equivalent to #1481) is standard on 3767 mdl 2 and mdl 3. **Prerequisite:** On model 1, #1482 requires #1481.

CALCULATE - SCIENTIFIC (#1572). In off-line mode, this feature, under switch control, using the same keyboard (with supplied keyfront label) allows the following type calculations to take place: addition, subtraction, multiplication, division, inverse calculation, square root, statistical value (mean and standard deviation), exponential, common logarithm, natural logarithm, exponential constant, circular constant and trigonometrical functions (sin, cos, tan, arcsin, arccos, arctan). Two memories are provided for temporary storage of totals. Sixteen digit input/output is allowed. **Maximum:** One. **Field Installation:** Yes.

EIA INTERFACE - NO CLOCK (#3718). Provides one EIA inter-

face for the attachment of an IBM 3863, 3872 or other external modem, with modem clocking (3767 clock disabled). **Specify:** #9402 for half duplex facility (combined modem and line), or #9404 for full duplex facility (combined modem and line) ... #9707 for attaching IBM 3872 Modem ... #9619 for switched facility. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with 1200 BPS Integrated Modem (#5500, 5502, 5505 or 5506), Start/Stop Feature (#7111 or 7113) or EIA Interface - With Clock (#3719). **Note:** When installed with Start/Stop Feature (#7112), the communication facilities must be full duplex. Full Duplex (#9404), S/S Line Speed (#9542), SDLC Line Speed (#9533) and Attach IBM 3863 or 3872 Modem (#9707) must be specified. Start/Stop operation is supported only at 1200 bps.

EIA INTERFACE - WITH CLOCK (#3719). Provides one EIA interface for the attachment of an external modem with business machine (3767) clocking. **Note:** This feature may be used for local attachment to 3704 or 3705 equipped with Line Set Type 1F for operation at 300, 600 or 1200 bps. If this feature is to be used with a 1F line set, specify #9404. **Specify:** #9402 for half duplex facility, or #9404 for full duplex facility ... #9619 for switched facility. On the mdls 1 and 2 only, #9539 must also be specified when operating at 300 bps on the Public Switched Network with "Originate Only" service when the modem to be used does not provide the "received line signal detector" interchange circuit, as for example the Western Electric 113 A or equivalent. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with 1200 bps Integrated Modem (#5500, #5502, #5505 or #5506), or EIA Interface - No Clock (#3718). **Prerequisites:** #9532 for C4/D3 (1200 bps) or #9531 for C3 or D2 (600 bps). If Start/Stop Feature is installed, that feature's line speed specify.

MAGNETIC STRIPE READER (#4930). A small self enclosed device for reading information from a Magnetically Striped and Encoded I.D. Card and a Magnetic Credit Card (2-1/8" x 3-3/8"). Reads up to 40 ABA standard numeric characters, including control characters. See IRD Sales Manual for information on cards. **Maximum:** One. **Field Installation:** Yes. Customer will set up at time of 3767 delivery -- CE will install if ordered. **Limitation:** Not functional when operating in Start/Stop (#7111, 7112, 7113) mode.

1200 BPS INTEGRATED MODEM (#5500). Non-switched. A modem for operation at 300, 600 or 1200 bps over two or four wire non-switched voice grade channels. **Specify:** #9402 for 2-wire communications facilities, #9404 for 4-wire facilities. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with EIA Interface (#3718 or #3719) or 1200 bps Integrated Modem (#5502, #5505 or #5506). **Prerequisites:** #9532 for D3 (1200 bps) or #9531 for D2 (600 bps) facilities. If Start/Stop Feature is installed, that feature's line speed specify.

1200 BPS INTEGRATED MODEM (#5502). Switched. A manual answer modem for operation at 300, 600 or 1200 bps over Public Switched Telephone Networks. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with EIA Interface (#3718 or #3719) or 1200 bps Integrated Modem (#5500, #5505 or #5506). **Prerequisites:** #9532 for C4 (1200 bps) or #9531 for C3 (600 bps) facilities. If Start/Stop Feature is installed, that feature's line speed specify. **Note:** This feature requires either Acoustic Coupler - 600 bps (#1110) or a CDT type Data Access Arrangement or equivalent.

1200 BPS INTEGRATED MODEM/INTERRUPT (#5505). [Mdl 1 and 2 only] Non-switched. A modem for operation at 300 (Start/Stop), 600 or 1200 (SDLC) bps over 2-wire non-switched voice grade channels. This modem includes a bi-directional reverse channel capability. This interrupt signal is transmitted when the ATTN key on the 3767 keyboard is depressed. **Note:** This featured modem is required to transmit or receive an interrupt only with Start/Stop 2741 (#7113) operating at 300 bps in Start/Stop mode on a half-duplex non-switched channel and the EIA Interface (#3719) is not used. Line Set Type 8C on 3704 or Line Set Type 12A on the 3705 is required to support this feature. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with EIA Interface (#3718 or #3719) or 1200 bps Integrated Modem (#5500, #5502 or #5506). **Prerequisite:** #9532 for D3 (1200 bps) or #9531 for D2 (600 bps) and #9540 for D1 (300 bps) facilities.

1200 BPS INTEGRATED MODEM/INTERRUPT (#5506). [Mdl 1 and 2 only] Switched. A manual answer modem for operation at 300 (Start/Stop), 600 or 1200 (SDLC) bps over Public Switched Telephone Networks. This modem includes a bi-directional reverse channel capability. This interrupt signal is transmitted when the ATTN key on the 3767 keyboard is depressed. **Note:** This featured modem is required to transmit or receive an interrupt only with Start/Stop 2741 (#7113) operating at 300 bps in Start/Stop mode on a half-duplex switched channel and EIA Interface (#3719) is not used. Line Set Type 8D on the 3704 or Line Set Type 12B on the 3705 is required to support this feature. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be

**3767 Communication Terminal** (cont'd)

installed with EIA Interface (#3718 or #3719) or 1200 bps Integrated Modem (#5500, #5502, or #5505). **Prerequisite:** #9532 for C4 (1200 bps) or #9531 for C3 (600 bps) and #9540 for C1 (300 bps) facilities. **Note:** This feature requires either Acoustic Coupler - 600 bps (#1110) or a CDT type Data Access Arrangement or equivalent.

SECURITY KEYLOCK (#6660). Provides a key operated switch. When in the "locked" position, machine operations cannot be performed. Two keys are provided. For additional or replacement keys, see "Locks and Keys" in M 10000 pages. **Maximum:** One. **Field Installation:** Yes.

START/STOP FEATURE (#7111, 7112, 7113). These features provide a Type I Start/Stop line control migration aid on the 3767 to allow operation with existing program support (see Programming Section). This feature allows data transmission to or from a Virtual Storage S/370 mdl 115 thru 168MP or a 3031 or 4300 Processor via a 3704 or 3705 at 300 bps (2740-1 or 2741 Line Control) or at 600 or 1200 bps (2740-2 Line Control) or via a 2701 at 600 bps (2740-2 Line Control). It also allows transmission, via communications facility to or from a 3115 ICA, 3125 ICA, 3135 ICA, 3135-3 ICA or 3138 ICA at 300 bps (2740-1 or 2741 Line Control) or at 600 bps (2740-2 Line Control). 1200 bps (2740-2 Line Control) also supported by 3115 ICA and 3125 ICA. It allows communications via a 3704/3705 Communications Controller attached to a channel of a S/360 mdl 30, 40, 50, 65, 67 (in 65 mode), 75 and 195 at 300 bps (2740-1 or 2741 Line Control) or at 600 bps or 1200 bps (2740-2 Line Control); via a 2701 attached to a channel of a S/360 mdl 22, 25, 30, 40, 44, 50, 65, 67 (in 65 mode), 75 and 195; or a S/370 mdl 155, 165, 195, or any 4300 Processor, at 600 bps (2740-2 Line Control); or via an Integrated Communications Attachment on S/360 mdl 25 at 600 bps (2740-2 Line Control). Attachment is also possible via the Communications Adapter feature on the 4331 ... see 4331 for details. An SDLC/Start-Stop switch is provided to allow operation in either mode. Communications facility must be specified for this feature. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with ASCII Feature (#1201).

Select One:

#7111 -- 2740-1 Line Control [Mdl 1 or 2 only] Specify: #9540 for C1/D1 (300 bps). **Note:** For multipoint -- specify **#9560** (Station Control) and see "Terminal and Group Addresses" (below) for additional information to be specified. **Note:** On a given non-switched line, one terminal within each group and one terminal for the entire line (All Call) must provide the necessary checking and addressing responses for that group and/or for the entire line. Specify **#9197** for a group responding and/or **#9035** for an All Call responding terminal. **Limitations:** Group or All Call addressing requires duplex communications facilities. Non-switched facility required for SDLC if Station Control (#9560) is specified. Cannot be installed with 2400 bps (#9533) or EIA Interface - No Clock (#3718).

#7112 -- 2740-2 Line Control [Mdl 1, 2 or 3] Buffer Receive mode is standard operation. **Limitations:** Group or All Call addressing requires duplex communications facilities. If multi-dropped on the same communications line with 2740-2s the 3767 must not be designated as the Group or All Call Responding terminal. Non-switched facility required for SDLC with this feature installed. Cannot be installed with Correspondence Keyboard (#9381). **Specify:** See "Terminal and Group Addresses" (below) for additional information to be specified. **Note:** On a given non-switched line, one terminal within each group and one terminal for the entire line (All Call) must provide the necessary checking and addressing responses for that group and/or for the entire line. Specify **#9197** for a group responding and/or **#9035** for an All Call responding terminal. Specify Line Speed -- **#9541** for D2 (600 bps) or **#9542** for D3 (1200 bps). Buffer Positions -**#9015** for 120, **#9016** for 248, or **#9017** for 440. **Note:** This specified feature has no effect on buffer size under SDLC line discipline. **Prerequisite:** On model 1, Buffer with Edit (#1481 or #1482).

#7113 -- 2741 Line Control [Mdl 1 or 2 only] Specify: #9540 for C1/D1 (300 bps). **Limitations:** Cannot be installed with 2400 bps (#9533) or EIA Interface - No Clock (#3718). **Note:** See "Terminal Identification" (below) for additional information to be specified.

The 2741 Transmit and Receive Interrupt function on the 3767 with #7113 (2741 Line Control) is supported via the following:

	1200 bps Intg'd Modem			External Modem		
	Sw'd	Non-Switched		Switched	Non-Switched	
	2-wire	2-wire	4-wire	2-wire (1)	2-wire (1)	4-wire
3115 ICA	---	---	#1231 4781	#1231	#1231	#1231
3125 ICA	---	---	1231 4781	1231	1231 or 1232	1231 or 1232
3135 ICA	---	---	---	9593-9600 9721-9728 9737-9744 9745-9752 9625-9632	9593-9600 9721-9728 9737-9744 9745-9752	9593-9600 9721-9728 9737-9744 9745-9752
3704	#4786	#4785	4781	4711 or 4714	4711 or 4714	4711 or 4714
3705	4786	4785	4781	4711 or 4714	4711 or 4714	4711 or 4714
3767	5506	5505	5500	3719	3719	3719
8130	---	---	5500	3701	3701	3701
8140	---	---	5500	3701	3701	3701
8101	---	---	5500	3701	3701	3701

(1) Modem must be full duplex.

Terminal and Group Addresses

Terminal and group addresses must be selected when one of the following Start/Stop Features is ordered:

#7111 for 2740 mdl 1 Line Control with Station Control (#9560) specified.

#7112 for 2740 mdl 2 Line Control.

For Terminal Address and Group Address, a two-character code must be selected as described below. The first character must be the Terminal Address, and the second character must be the Group Address. (The same character may be ordered for both addresses. However, in this case, the terminal will be wired at the factory as a Group Responding #9197 terminal.)

Depending on the Keyboard Arrangement specified for the base machine, the following characters may be selected for Terminal and Group Addresses:

With EBCDIC Keyboard Arrangement (#9391), select characters from:

A thru Z, 0 thru 9, and special characters @ (at sign) ... \$ (dollar sign) ... & (ampersand) ... - (hyphen) (period).

† With Correspondence Keyboard Arrangement (#9381), select characters from:

A thru Z (except B and X), 0 thru 8, and special characters = (equal) ... / (slash) ... ; (semi-colon) ... , (comma) (period) ... ' (apostrophe) ... - (hyphen).

† Not available with #7112.

If Alternate Character Set (#1291) is installed on the terminal, the Terminal and Group Address line code bit configuration remains the same for either switch setting.

Specify: #9644 (Terminal and Group Addresses) and enter the two-character code as Supplemental Specs based on the permissible characters listed above.

Terminal Identification

If Terminal Identification is used in the customer's application (provided by RPQ Auto Address Answer-back on the 2741), a four-character Terminal Identification must be selected when Start/Stop Feature - 2741 Line Control (#7113) and one of the following are ordered: #5502, #5506, or #3719 with #9619 (switched line operation) specified.

Depending on the Keyboard Arrangement specified on the base machine, the following characters may be selected for the Terminal Identification code.

With EBCDIC Keyboard Arrangement (#9391), select characters from:

A thru Z, 0 thru 9, and special characters # (number sign) ... / (slash) ... \$ (dollar sign) ... & (ampersand) ... @ (at sign) ... , (comma) (period) ... - (hyphen) ... C/R (carriage return) ... space.

With Correspondence Keyboard Arrangement (#9381), select characters from:

A thru Z, 0 thru 9, and special characters = (equal) ... / (slash) ... ' (apostrophe) ... - (hyphen) ... ; (semi-colon) (period) ... , (comma) ... C/R (carriage return) ... space.

**3767 Communication Terminal (cont'd)**

The same character may be selected for all four positions except C/R may only be used in the fourth position.

If Alternate Character Set (#1291) is installed on the terminal, the Terminal ID line code bit configuration remains the same for either switch setting.

Specify: #9645 (Terminal Identification) and enter the four-character code based on the above permissible characters. NOTE: For "space" character, enter %. For C/R character, enter * (available in fourth position only).

VARIABLE WIDTH FORMS TRACTOR (#8700). A forms feeding device for continuous edge-punched forms. Overall forms width from 3 to 15 inches can be fed. **Prerequisite:** Variable Width Forms Tractor Covers (#9850).

VERTICAL FORMS CONTROL (#8731). Allows vertical forms skipping to a pre-set page header location or a pre-set vertical tab position. Page size, header location and vertical tab stops are entered from the keyboard or received from the host under SDLC line control. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Variable Width Forms Tractor Covers (#9850) and Variable Width Forms Tractor (#8700). **Limitation:** This feature (#8731) is non-functional in Start/Stop (#7111, #7112, #7113) mode.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
For Model 1 Only				
Buffer with Edit - 512	#1481	\$ 24	\$ 20	\$ 700 \$1.00
For Model 1 and 2 Only				
Start/Stop Feature -				
2740-1 Line Control	7111	6	5	175 .50
2741 Line Control	7113	6	5	175 .50
1200 bps Integrated Modem w Interrupt -				
Non-switched	5505	31	26	1,185 10.00
Switched	5506	31	26	1,185 10.00
For Model 1, 2 and 3				
Acoustic Couplr-600 bps	1110	14	12	420 .50
ASCII Feature	1201	12	10	350 .50
Alt Character Set	1291	7	6	210 .50
Buffer w Edit - 1,024	1482	24	20	700 .50
Calculate - Scientific	1572	19	16	560 1.00
EIA Interface-No Clock	3718	13	11	385 1.00
EIA Interface-w Clock	3719	13	11	385 1.00
Magnetic Stripe Reader	4930	19	16	560 1.50
1200 bps Integrated Modem -				
Non-switched	5500	19	16	668 4.00
Sw w Manual Ans	5502	19	16	668 4.00
Security Keylock	6660	35SUC	—	35 NC
Start/Stop Feature -				
2740-2 Line Control	7112	6	5	175 .50
Var Width Forms Tractor	8700	6	5	160 .50
Vertical Forms Control	8731	13	11	385 .50

Accessories: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 pages for additional information and field installation.

FORMS STAND (#4450) — Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.



IBM 3771 COMMUNICATION TERMINAL

Purpose: This desk-style console-keyboard-printer is a member of the 3770 Data Communication System. Communication features permit operation over switched or non-switched facilities at speeds up to 4800 bps, using SDLC or BSC transmission techniques. Special features permit the attachment of one card reader or card punch operating at 50 cpm. The card punch can optionally be equipped with a special feature for Card Read to permit single path card reading or card punching.

- Model 1** 40 cps average print rate -- bi-directional
- Model 2** 80 cps maximum -- bi-directional
- Model 3** 120 cps maximum -- bi-directional

Highlights:

Keyboard -- EBCDIC arrangement with 44 data keys (produces 88 characters). Underscore/Hyphen, Backspace, Space, and "Print Character" keys have typamatic operation. Associated with the keyboard are indicator lights, function keys, operating mode switches, and a 3-position numeric display.

Printer -- prints serial by character while the wire-matrix print head is moving in either direction -- bi-directional printing. Print span is 132 positions at 10 characters per inch. Line spacing is 6 lines per inch. Single part continuous forms or up to three part cut forms can be handled with the standard friction feed platen. A variable width forms tractor, available as a special feature, is required for feeding multipart or preprinted continuous forms of up to six parts maximum (total thickness not greater than 0.018"). Five and six part continuous forms should be tried on an individual basis for acceptable feeding, registration and print quality. Overall forms widths from 3" to 15" can be accommodated. To facilitate handling of continuous forms, the Forms Stand (special feature) is recommended. Card stock continuous forms are not recommended. Refer to GA24-3488 for forms design considerations. A 94 character set is standard.

Dual 256-Byte Buffers -- transfer data between the input and output devices. The buffers alternate in providing input and output service to permit overlapped operation.

Buffer Edit -- allows corrections to be made on the contents of a buffer during key entry jobs. Corrections can be made by character, by line, or by entire buffer (up to 256 bytes).

Extend Buffer -- combines the dual 256-byte buffers into a single 512-byte buffer under operator control for keyboard to line jobs. Buffer edit capability applies to the full 512 bytes. Buffer transfers to line are in 256-byte increments and cannot be overlapped.

Printer Format Controls -- facilitate the formatting of printed data. Vertical and horizontal control characters in data initiate vertical or horizontal tabbing. Format controls can be entered from keyboard, or from an attached card reader, or can be system defined.

Compression/Expansion -- provides a means for improving the efficiency of data transmission. For BSC, the compression option can be invoked at the terminal for a job that reads non-transparent data from cards. A two-byte sequence is substituted for each occurrence of three or more consecutive blank card columns (63 consecutive blanks is the upper limit). A second two-byte sequence is appended if more than 63 consecutive blank columns are read. The terminal monitors received non-transparent data that is destined for printer or attached card punch and automatically expands this two-byte sequence to the correct number of blanks. A similar capability is provided when using SDLC procedures.

Input/Output Selection -- is under control of keyboard setup with an option for entering one set of printer format controls from the keyboard or the card reader. A fully configured 3771 will allow the following:

Offline Jobs

Input	Output
Keyboard	Printer
Card Reader	Printer
Keyboard*	Card Punch

Online Batch Jobs

Card Reader	Line**
Line	Printer
Line	Card Punch**

Online Interactive Jobs

Keyboard*	Line
Line	Printer

*Output to printer is automatic.

**Monitor Print is an output option in addition to line or card punch.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem identification and recovery routines and procedures that are easily understood and used by the operator. See IBM 3771/3773 Operating Procedures Guide, GA27-3100.

Communications: See "Special Features." Transmission speeds up to 4800 bps over switched or non-switched facilities are allowed by selecting the appropriate modem and communication facility. Refer to 3770 Data Communication System in "Systems" for a Communication Configurator. Refer to M 2700 pages for information on communication facilities, and other attachment information. Also refer to 3863, 3864, 3872 and 3874 in "Machines."

Supplies: A black ribbon, IBM Part No. 1136653, or equivalent, is required

Customer Responsibilities: It will be a customer's responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Limitations: The input/output capabilities under "Highlights" are dependent on appropriate configurations of the terminal. Keyboard and console printer are standard. For other configurations, refer to "Special Features" below.

Prerequisites:

For SDLC Communications with S/370 or 4300 Processors -- a 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2, or these operating systems running under VM/370. **Note:** OS/VS2 is not supported on 4300 Processors. SDLC communication is also available via the Communications Adapter feature on the 4331 ... see "Programming" for software support available.

For BSC Communications with S/360, S/370 or 4300 Processors -- a virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or these operating systems running under VM/370. **Note:** OS/VS2 is not supported on the 4300 Processors. The 3770 Communication Terminals use 2770 BSC programming support when operating in BSC mode. Operation with S/360, S/370 and 4300 Processors using 2770 BSC programming is also permitted. See SRL GA27-3097 for BSC compatibility considerations. The customer may have to modify existing 2770 application programs for operation with 3770. BSC attachment can be made via a 3704/3705 Communications Controller or a 2701 Data Adapter Unit attached to a channel of any S/370 or 4300 Processor, via an Integrated Communications Adapter on S/370 mdl 115, 125 or 135 or via the Communications Adapter feature on a 4331. BSC attachment can be made via a 3704/3705 Communications Controller attached to a channel of a S/360 mdl 30, 40, 50, 65, 67 (in 65 mode) 75 and 195; via a 2701 attached to a channel of a S/360 mdl 22, 25, 30, 40, 44, 50, 65, 67 (in 65 mode), 75 and 195; or via an Integrated Communications Attachment on S/360 mdl 25.

Bibliography: GC20-0001.

Specify: [1]Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray. **Note:** Available at time of manufacture only.

[3] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual - Physical Planning, GA27-3006.

PRICES:	Mdl	ETP/ MLC/ 2 Yr		Purchase	MMMC
		MAC/ MRC			
3771	1	\$229	\$195	\$8,400	\$ 59.50
	2	259	220	8,800	68.00
	3	306	260	10,400	78.50

Plan Offering: Plan B Machine Group: D Per Call: 1
Purchase Option: 45% Warranty: B Useful Life Category: 2
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Upper Limit Percent: 0%

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

- Model 1 to Model 2 \$ 700
- Model 1 to Model 3 2,500
- Model 2 to Model 3 2,300.



3771 Communication Terminal (cont'd)
SPECIAL FEATURES

[All special features can be field installed, except #1201 for which field installation is not recommended.]

For Communication Capability -- select one Communication Feature (#1460, 1461 or 1470) ... one Communication Driver (#1481 or 1482) ... and one Integrated Modem (#5500, 5501, or 5502) or EIA Interface (#3701). #1462 is required in addition to #1460 or #1461 for multipoint operation using BSC.

COMMUNICATION FEATURE ... one can be selected.

SDLC/BSC, SWITCH CONTROL (#1460). Provides communication procedure using SDLC or BSC under operator switch control. SDLC allows point-to-point or multipoint operation. BSC operation is point-to-point without #1462, multipoint with #1462. **Maximum:** One. **Limitation:** Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461). Provides for point-to-point BSC operation over switched or non-switched facilities. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched and non-switched SDLC procedures. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1461. For record purposes also identify CPU/Program Environment code. Specify one of the following: #9977 for DOS/VS VTAM, #9988 for OS/VSI VTAM, #9989 for OS/VS2 VTAM, or #9993 for all other combinations of operating systems and access methods.

BSC MULTIPOINT (#1462). Required for BSC multipoint operation over nonswitched facilities. **Maximum:** One. **Prerequisite:** #1460 or #1461. **Limitation:** See SRL GA27-3097 for BSC compatibility considerations.

COMMUNICATION DRIVER ... one can be selected.

WITHOUT BUSINESS MACHINE CLOCKING (#1481). Provides communication driver without clocking. **Maximum:** One. **Prerequisite:** Communication Feature #1460, 1461 or 1470. **Limitation:** Cannot be installed with #1482.

WITH 1200 BPS BUSINESS MACHINE CLOCKING (#1482). Provides communication driver with 1200 bps clocking. **Maximum:** One. **Prerequisite:** Communication Feature #1460, 1461 or 1470. **Limitation:** Cannot be installed with #1481.

EIA INTERFACE OR INTEGRATED MODEM ... one can be selected.

EIA INTERFACE (#3701). Provides a cable and interface meeting RS-232C characteristics for attachment of an IBM Modem or non-IBM modem. Speeds up to 4800 bps for switched or non-switched operation are permitted. This feature in combination with #1481 can be used to attach to Modem Fan-out (#3901) on an adjacent terminal, or on an IBM 3863, 3864, 3872 or 3874 Modem. This feature in combination with #1482 can be used for direct attachment to a 3704 or 3705 equipped with Local Attachment (#4716) for operation at 1200 bps synchronous. **Maximum:** One. **Prerequisite:** Communication Driver (#1481 or 1482). **Limitation:** Cannot be installed with any Integrated Modem feature.

1200 BPS INTEGRATED MODEM, NON-SWITCHED (#5500). Provides for point-to-point or multipoint operation over non-switched communication facilities. **Maximum:** One. **Prerequisite:** Communication Driver with Clocking (#1482). **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, AUTO ANSWER (#5501). Provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. **Maximum:** One. **Prerequisite:** Communication Driver (#1482). The user must provide a Data Coupler type CBS or equivalent. **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, MANUAL ANSWER (#5502). Provides for point-to-point operation over switched networks using manual originate/manual answer for establishing connection. **Maximum:** One. **Prerequisite:** Communication Driver (#1482). The user must provide a Data Coupler type CDT or equivalent. **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with BSC features #1460, #1461 or #1462, or with SDLC features #1460 or #1470. **Maximum:** One. **Field Installation:** Not recommended for field installation.

AUDIBLE ALARM (#1390). Sounds an alarm to alert the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. **Maximum:** One.

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with this feature. Refer to M 10000 pages for information on additional or replacement keys. **Maximum:** One.

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read.

With BSC, a read operation can be initiated during a keyboard to line job only. Data read from the magnetic stripe card cannot be printed. **Maximum:** One. **Limitations:** (1) The operator must position and slide the card through the reader-slot at a steady rate between 5" and 40" per second for a read operation. (2) BSC programming for 2770 does not support this feature.

3501 CARD READER ATTACHMENT (#8050). To attach a 3501 Card Reader. **Maximum:** One. **Limitation:** Cannot be installed with #8150.

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. **Maximum:** One. **Limitation:** Cannot be installed with #8050.

VARIABLE WIDTH FORMS TRACTOR (#8700). Provides a forms feeding device for continuous edge-punched forms. Overall forms width from 3" to 15" can be fed. Refer to Forms Design Reference Guide for Printers, GA24-3488. **Maximum:** One.

Special Feature Prices:	ETP/		Purchase	MMMM	
	MAC/ MRC	MLC 2 Yr			
Communication Feature					
SDLC/BSC, Swch Cntrl	#1460	\$25	\$21	\$840	\$5.50
BSC, Point-to-Point	1461	15	13	520	3.00
SDLC	1470	13	11	440	3.00
BSC Multipoint	1462	13	11	440	1.00
Communication Driver					
w/o Bus Mch Clocking	1481	13	11	440	2.00
w 1200 BPS Business					
Machine Clocking	1482	15	13	520	3.00
EIA Interface	3701	13	11	440	1.00
1200 BPS Integrated Modem					
Non-Switched	5500	19	16	668	4.00
Switched, Auto Answer	5501	25	21	840	4.00
Switched, Mnl Answer	5502	19	16	668	4.00
ASCII Feature	1201	18	15	600	.50
Audible Alarm	1390	40 SUC -		40	.50
Keylock	4650	35 SUC -		35	NC
Operator ID Reader	5450	13	11	440	1.50
3501 Card Reader Attach	8050	13	11	440	.50
3782/3521 Card Reader					
Attachment	8150	19	16	640	3.50
Variable Wdth Fms Trctr	8700	6	5	160	.50

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

Forms Stand (#4450) -- Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.



IBM 3773 COMMUNICATION TERMINAL

[No Longer Available]

Purpose: This desk style console-keyboard printer includes as standard a diskette storage device with removable, reusable diskette. It is a member of the 3770 Data Communication System. Communication features permit operation over switched or non-switched facilities at speeds up to 4800 bps. It uses the SDLC or BSC transmission technique.

Model 1, P1	40 cps average print rate -- bi-directional
Model 2, P2	80 cps maximum -- bi-directional
Model 3, P3	120 cps maximum -- bi-directional

The prefix "P" on the model number designates user-programmable.

Specify: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): **#9880** for locking plug, or **#9881** for non-lock plug.

[2] Color: **#9041** for red, **#9042** for yellow, **#9043** for blue, or **#9045** for gray.

[3] Remote Power Off: **#9501** ... specify this feature for capability to power down terminal from the host CPU using a controlled data sequence over communication facilities.

[4] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual - Physical Planning, GA27-3006.

[5] Alternate Address: **#9011** ... for EC record purposes only. Order this optional feature to specify that diskettes containing terminal control code engineering changes are to be mailed to an alternate address using a Teleprocessing Control number. The alternate address selected is usually the central site location. Limitation: For models P1, P2, P3 only. Field installable.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
3773	1†	\$311	\$265	\$11,200	\$74.50
	2†	341	290	11,600	78.50
	3†	388	330	13,200	102.00
	P1†	370	315	13,200	113.00
	P2†	380	323	13,600	117.00
	P3†	419	357	14,280	132.00

Plan Offering: Plan B Machine Group: D Per Call: 1
Warranty: B Purchase Option: 50%
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Upper Limit Percent: 0% Useful Life Category: 2

Model Changes: Field Installable on an "As Available" basis.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

Model 1 to Model 2	\$700
Model 1 to Model 3	2,500
Model 1 to Model P1	4,400
Model 1 to Model P2	5,100
Model 1 to Model P3	6,700
Model 2 to Model 3	2,300
Model 2 to Model P2	4,400
Model 2 to Model P3	6,000
Model 3 to Model P1	4,400
Model P1 to Model P2	700
Model P1 to Model P3	2,300
Model P2 to Model P3	1,360

SPECIAL FEATURES

All special features can be field installed, except #1201 and #4660 for which field installation is not recommended. Special features are on an "As Available" basis for field installation.

For Communication Capability -- select one Communication Feature (#1460, 1461 or 1470) ... one Communication Driver (#1481 or 1482) ... and one Integrated Modem (#5500, 5501, 5502) or EIA Interface (#3701). #1462 is required in addition to \$1460 or #1461 for multipoint operation using BSC.

COMMUNICATION FEATURE... one can be selected.

SDLC/BSC, SWITCH CONTROL (#1460). Provides communication procedure using SDLC or BSC under operator switch control. SDLC allows point-to-point or multipoint operation. BSC operation is point-to-point without #1462, multipoint with #1462. **Maximum:** One. **Limitation:** Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461): Provides for point-to-point BSC operation over switched or non-switched facilities. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1470.

† No longer available.

See SRL GA27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched and non-switched SDLC procedures. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1461. For record purposes also identify the primary CPU/Program Environment code. Specify one of the following: **#9977** for DOS/VS VTAM, **#9988** for OS/VS1 VTAM, **#9989** for OS/VS2 VTAM, or **#9993** for all other combinations of operating systems and access methods.

BSC MULTIPOINT (#1462). Required for BSC multipoint operation over non-switched facilities. **Maximum:** One. **Prerequisite:** #1460 or #1461. **Limitation:** See SRL GA27-3097 for BSC compatibility considerations.

COMMUNICATION DRIVER ... one can be selected.

WITHOUT BUSINESS MACHINE CLOCKING (#1481). Provides a communication driver without clocking. **Maximum:** One. **Prerequisite:** Communication Feature #1460, #1461 or #1470. **Limitation:** Cannot be installed with #1482.

WITH 1200 BPS BUSINESS MACHINE CLOCKING (#1482). Provides a communication driver with 1200 bps clocking. **Maximum:** One. **Prerequisite:** Communication Feature #1460, #1461 or #1470. **Limitation:** Cannot be installed with #1481.

EIA INTERFACE OR INTEGRATED MODEM ... one can be selected.

EIA INTERFACE (#3701). Provides a cable and interface meeting RS-232C characteristics for attachment of an IBM Modem or non-IBM modem. Speeds up to 4800 bps for switched or non-switched operation are permitted. This feature in combination with #1481 can be used to attach to Modem Fanout (#3901) on an adjacent terminal, or on an IBM 3863, 3864, 3872 or 3874 Modem. This feature in conjunction with #1482 can be used for direct attachment to a 3704 or 3705 equipped with Local Attachment (#4716) for operation at 1200 bps synchronous. **Maximum:** One. **Prerequisite:** Communication Driver (#1481 or 1482). **Limitation:** Cannot be installed with any Integrated Modem feature.

1200 BPS INTEGRATED MODEM, NON-SWITCHED (#5500). Provides for point-to-point or multipoint operation over non-switched communication facilities. **Maximum:** One. **Prerequisite:** Communication Driver with Clock (#1482). **Limitation:** Cannot be installed with #3701 or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, AUTO ANSWER (#5501). Provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. **Maximum:** One. **Prerequisite:** Communication Driver (#1482). The user must provide a Data Coupler Type CBS or equivalent. **Limitation:** Cannot be installed with #3701 or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, MANUAL ANSWER (#5502). Provides for point-to-point operation over switched network facilities using manual originate/manual answer for establishing connection. **Maximum:** One. **Prerequisite:** Communication Driver (#1482). The user must provide a Data Coupler Type CDT or equivalent. **Limitation:** Cannot be installed with #3701 or with another Integrated Modem.

ASCII FEATURE (#1201). A 48 data keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. The feature also provides for operation with diskette storage and with BSC features #1460, #1461 or #1462, or with SDLC features #1460 or #1470. **Maximum:** One. **Field Installation:** Not recommended.

AUDIBLE ALARM (#1390). Sounds an alarm to alert the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. **Maximum:** One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. **Maximum:** One. **Limitation:** The keys provided with this lock can be duplicated by local key makers. Additional or replacement keys are not available from IBM.

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with this feature. Refer to M 10000 pages for information on additional or replacement keys. **Maximum:** One.

KEYPAD, NUMERIC (#4660). Provides a keypad in adding machine arrangement to facilitate rapid entry of numeric only data. **Maximum:** One. **Prerequisite:** Model P1, P2 or P3. **Limitation:** Not available for mdl's 1, 2 or 3. **Field Installation:** Not recommended.

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read.



3773 Communication Terminal (cont'd)

With a BSC non-programmable terminal, a read operation can be initiated during a keyboard to line job only. Data read from the magnetic stripe card cannot be printed. For a programmable terminal the Operator ID Reader (#5450) is under control of the 3770 application program. **Maximum:** One. **Limitation:** (1) The operator must position and slide the card through the reader-slot at a steady rate between 5" and 40" per second for a read operation ... (2) BSC programming for 2770 does not support this feature.

STORAGE INCREMENT, 4K (#6800). Provides an additional 4096 bytes of programmable storage. **Maximum:** One. **Prerequisite:** Model P1, P2 or P3. **Limitation:** Not available for mdls 1, 2 or 3, or with #6801.

STORAGE INCREMENT, 8K (#6801). Provides an additional 8192 bytes of programmable storage. **Maximum:** One. **Prerequisite:** Model P1, P2 or P3. **Limitation:** Not available for mdls 1, 2 or 3, or with #6800.

VARIABLE WIDTH FORMS TRACTOR (#8700). Provides a forms feeding device for continuous edge-punched forms. Overall forms widths from 3" to 15" can be feed. Refer to Forms Design Reference Guide for Printers, GA24-3488. **Maximum:** One.

Special Feature Prices:	MAC MRC	ETP/ MLC		Purchase	MMMC
		2 Yr			
Communication Feature					
SDLC/BSC, Swch Cntrl	#1460	\$25	\$21	\$840	\$5.50
BSC, Point-to-Point	1461	15	13	520	3.00
SDLC	1470	13	11	440	3.00
BSC Multipoint	1462	13	11	440	1.00
Communication Driver					
w/o Bus Machine Clking	1481	13	11	440	2.00
w 1200 BPS Business Machine Clcking	1482	15	13	520	3.00
EIA Interface	3701	13	11	440	1.00
Keypad, Numeric	4660	12	10	400	2.00
1200 BPS Integrated Modem					
Non-Switched	5500	19	16	668	4.00
Switched, Auto Answer	5501	25	21	8.40	4.00
Switched, Mnl Answer	5502	19	16	668	4.00
ASCII Feature	1201	18	15	600	.50
Audible Alarm	1390	40	SUC -	40	.50
Door Keylock	3401	15	SUC -	15	NC
Keylock	4650	35	SUC -	35	NC
Operator ID Reader	5450	13	11	440	1.50
Storage Increment, 4K	6800	18	15	351*	4.50
Storage Increment, 8K	6801	32	27	637	6.50
Vbl Wdth Forms Trctr	8700	6	5	160	.50

*Customers who elect to purchase this feature and anticipate later ordering additional storage, should consider purchase of the larger storage initially because a field upgrade requires replacement of the initial feature.

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed on M 10000 pages. See M 10000 for additional information and field installation.

Forms Stand (#4450). - Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

**IBM 3774 COMMUNICATION TERMINAL**

[Models 1 and 2 are no longer available]

Purpose: This desk-style console-printer-keyboard is a member of the 3770 Data Communication System. The basic printer operates at a maximum speed of 80 or 120 characters per second and prints bi-directional, serial by character, using a wire-matrix print head. Special features permit one or two diskette storage devices and provide for the addition of an additional printer, the 3784 Line Printer, and one card reader and one card punch. One of three card readers can be selected for operation at speeds of 50, 150 or 300 cards per minute. The card punch operates at 50 cpm.

Communication features allow for operation over switched or non-switched facilities at speeds up to 4800 bps using SDLC or BSC transmission techniques and an appropriate modem.

Model 1, P1 80 cps maximum -- bi-directional printer
Model 2, P2 120 cps maximum -- bi-directional printer

The prefix "P" on the model number designates user-programmable.

Highlights:**All Models**

Keyboard -- EBCDIC arrangement with 44 data keys (produces 88 characters). Underscore/Hyphen, Backspace, Space and "Print Character" ("Character" on programmable models) keys have typamatic operation. Associated with the keyboard are indicator lights, function keys, operating mode switches, and a 3-position numeric display.

Printer -- prints serial by character at a maximum rate of 80 or 120 characters per second while the wire-matrix print head is moving in either direction -- bi-directional printing. Print span is 132 positions at 10 characters per inch. Line spacing is 6 lines per inch. The 3774 mdls P1 and P2 (without Emulator) provide for line spacing of 6 or 8 lines per inch. Single part continuous forms or up to three part cut forms can be handled with the standard friction feed platen. A variable width forms tractor (a special feature), is required for feeding multipart or preprinted continuous forms of up to six parts maximum (total thickness not greater than 0.018"). Five and six part continuous forms should be tried on an individual basis for acceptable feeding, registration and print quality. Overall form widths from 3" to 15" can be accommodated. To facilitate handling of continuous forms, the Forms Stand (an accessory) is recommended. Card stock continuous forms are not recommended. Refer to GA24-3488 for forms design considerations. A 94 character set is standard.

Performance Considerations -- actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communications facilities, transmission block length, compressing characteristics, characters read/printed, forms skipping, application processing, etc., must all be considered in determining actual throughput. See *IBM 3770 Data Communication System, GA27-3097*, for additional information.

Problem Determination Procedures -- significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem identification and recovery routines and procedures that are easily understood and used by the operator. See *IBM 3774/3775 Operating Procedures Guide, GA27-3094*, or *IBM 3773, 3774 and 3775 Programmable Communication Terminals Operator's Guide, GA27-3114*.

Communications -- see "Special Features." Transmission speeds up to 4800 bps over switched or non-switched facilities are allowed by selecting the appropriate modem and communication facility. Refer to 3770 Data Communications System in "Systems" for a Communication Configurator. Refer to M 2700 pages for information on communications facilities and other attachment facilities. Also refer to 3782 and 3784 in "Machines." The 2400 BPS Integrated Modem and IBM 3872 Modem when appropriately configured can be intermixed on the same communication facility.

Supplies -- a black ribbon, IBM Part No. 2236653, or equivalent, is required

Customer Responsibilities -- it will be a customer's responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Prerequisites:

For SDLC Communications with S/370 or 4300 Processors -- a 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or these operating systems running under VM/370. Note: OS/VS2 is not supported by the 4300 Processors.

For BSC Communications with S/360, S/370 or 4300 Processors -- a virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or under RSCS (non-programmable terminals only) and VM/370; or any of these operating systems running under VM/370. **Note:** OS/VS2 is not supported by the 4300 Processors. The 3776 Communication Terminals use 2770/3780 BSC programming support when operating in BSC mode. Operation with S/360, S/370 or 4300 Processors using 2770/3780 BSC programming is also permitted. See SRL GA27-3097 for BSC compatibility considerations. The customer may have to modify existing 2770/3780 application programs for operation with 3774. The customer will have to modify existing application programs for operation with programmable models of the 3774. BSC attachment can be via a 3704/3705 Communications Controller, or a 2701 Data Adapter Unit attached to a channel of any S/370 or 4300 Processor; or via an Integrated Communications Adapter on S/370 mdl 115, 125, 135, 135-3 or 138; or via a Communications Adapter feature on the 4331 Processor. BSC attachment can be made via a 3704/3705 attached to a channel of a S/360 mdl 30, 40, 50, 65, 67 (in 65 mode), 75 or 195; via a 2701 attached to a channel of a S/360 mdl 22, 25, 30, 40, 44, 50, 65, 67 (in 65 mode), 75 or 195; or via an Integrated Communications Attachment on S/360 mdl 25.

Non-programmable Models and Programmable Models with Emulator Specify Feature

Dual 256-Byte Buffers -- transfer data between the input and output devices. The buffers alternate in providing input and output service to permit overlapped operation.

Buffer Edit -- allows corrections to be made on the contents of a buffer during key entry jobs. A 256-byte diskette record, if the diskette feature is present, can also be retrieved into the buffer using Update Mode and be corrected using buffer edit functions. Corrections can be made by character, by line or by entire buffer (up to 256 bytes).

Extend Buffer -- combines the dual 256-byte buffers into a single 512-byte buffer under operator control for keyboard to line or keyboard to diskette jobs. Buffer edit capability applies to the full 512 bytes. Buffer transfers to line or diskette are in 256-byte increments and cannot be overlapped.

Printer Format Controls -- facilitate the formatting of printed data. Vertical and horizontal control characters in data initiate vertical or horizontal tabbing. Format controls for up to 5 jobs can be entered from keyboard, or from diskette or card if either one of these devices is attached.

Compression/Expansion -- provides a means for improving the efficiency of data transmission. For BSC, the compression option can be invoked at the terminal for a job that reads non-transparent data from cards. A two-byte sequence is substituted for each occurrence of three or more consecutive blank card columns (63 consecutive blanks is the upper limit). A second two-byte sequence is appended if more than 64 consecutive blank columns are read. The terminal monitors received non-transparent data that is destined for printer or attached card punch and automatically expands this two-byte sequence to the correct number of blanks. A similar capability is provided when using SDLC procedures.

Auto Interrupt -- allows the terminal to automatically interrupt an offline job for an online job initiated by the host CPU. The terminal stops the offline job, executes the online job for receiving line data, automatically restarts the offline job without operator intervention. A manual switch on the keyboard enables/disables this mode of operation. See "Operating Characteristics - Automatic Interrupt" in *3770 Systems Components Manual, GA27-3097*.

Input/Output Job Definitions -- can be operator or terminal defined. Up to five operator defined jobs can be read from diskette or card reader to facilitate rapid job set-up when the terminal is equipped with either of the special features, otherwise they can be entered from keyboard under control of a prompting sequence and executed from temporary storage. Printer format controls can be part of the job definition. An appropriately configured 3774 will permit input/output job designations as follows:

Offline Jobs**Input**

- Keyboard*
- (1) Diskette
- (1) Card Reader
- (2) Keyboard & Diskette
- (2) Keyboard & Card Reader

Output

- Console Printer, Diskette, Card Punch or Printer 2nd
- Console Printer, Diskette, Card Punch or Printer 2nd
- Console Printer, Diskette, Card Punch or Printer 2nd
- Console Printer and either Diskette or Card Punch
- Console Printer and either Diskette or Card Punch

Online Batch Jobs

- (1) Diskette or Card Reader
- Line

3774 Communication Terminal (cont'd)

(1) Line Console Printer, Diskette, Card Punch or Printer 2nd

Online Interactive Job

Keyboard* Line
Line Console Printer

* One input device and one output device per job. Output to console printer is automatic when input is keyboard.

- (1) One input device and one output device per job. Monitor print is an additional output option when diskette, card punch or line is the output device.
- (2) Record Format Feature (#6010) is required in addition to I/O devices to allow multiple input and output devices for a job.

Limitations: The input/output capabilities outlined under "Highlights" are dependent on appropriate configurations of the terminal. Keyboard and console printer are standard. For other configurations refer to "Special Features" below.

Programmable Models Without Emulator Specify Feature

Offline Operations - are controlled by a user written program. The 3774 interprets the user written program after it is loaded to program storage from diskette storage. The 3774 has 6K bytes of program storage as standard. Additional 4K, 8K, 12K or 16K bytes of program storage are available by special feature to a maximum of 16K additional bytes of program storage. A program can be selected and invoked by the operator, by a prior program call, or by an auto execute command from the host CPU. Valid data sources for offline operations are the Operator ID Reader, keyboard, diskette storage and card reader. Valid data output devices are the console printer, diskette storage, card punch, 3784 Line Printer and display.

3774P system utilities provide additional capabilities for the following operations:

- Card reader to console printer, diskette, card punch, or 3784 Printer.
- Card print (Read Interpret).
- Keyboard to card punch.
- Create, copy, list diskette.
- Data set support for bypass, create, delete, erase, rename and write protect data set.
- Data set update for create, read, write and dump data set.
- Copy data set.
- Program library support.
- Print error log.
- Set date.
- Set configuration.

Storage Considerations - storage is used for executing a 3770 application program that is loaded from diskette, for Communications Mode, for data buffers, and for execution of device-related functions that are specified by the opening statement in the application program. Storage may also be allocated for devices and functions at power on time through options available in the Terminal Configuration Utility. The amount of storage required for devices or functions is:

Supervisor Control Code Resident	3.0K bytes
Programmable Communications - BSC	2.0K bytes
Programmable Communications - SDLC Communications Mode	7.0K bytes
Basic (diskette and console printer I/O)	6.0K bytes
Additional Storage for Card I/O & 3784 Printer	
Using BSC Communications	4.0K bytes
Using SDLC Communications	5.75K bytes
Additional Storage Using SDLC	
Multiple SYS.INTR Function	.75K bytes
Format Image Buffer (Power on Allocation only)	256 bytes
3501 Card Reader	1.75K bytes
2502 Card Reader	2.5K bytes
Display Feature	2.5K bytes
3521 Card Punch	3.0K bytes
Read-Next Buffers (optional for diskette operation)	0.25K bytes for each data set to a max. of 5.

The amount of storage required is also dependent upon the following variables:

Size of 3770 application program	XK bytes
Working storage for tables, storage to storage operations, buffers, etc., including 0.75K bytes for basic three buffers	XK bytes

Online Communications Operation - terminals equipped with the appropriate I/O and Communications features can operate as follows:

Transmission is controlled by the Communications Mode function or by a user written program using the Programmable Communications function. Communicate Mode provides for selection of diskette datasets, card reader or keyboard (Logon)

for input data. Output data can be directed to a diskette data-set, card punch, console printer or 3784 Printer. Support is provided for printer horizontal and vertical format control. The programmable Communications capability allows for transmission of data with any I/O device under control of a user written program.

Diskette Storage Device - with 99,840 bytes of storage is standard on a non-removable diskette. Characteristics of the non-removable diskette are one read/write surface, 30 data tracks, 26 sectors per track and 128 bytes per sector. Up to 390 256-byte records or up to 780 128-byte records can be stored on the non-removable diskette. Programmable communication (SDLC) reduces the amount of storage for user data from 30 to 28 tracks.

Two additional Diskette Storage Devices providing 242,944 bytes of storage each on removable reusable diskettes are provided by special feature.

The diskettes can be used for storage of 3770 application programs and for application data. The maximum number of user written data sets that can reside on the non-removable diskette and removable diskette is 18. A maximum of seven data sets can be opened for any one program. A program library data set can contain a maximum of 99 user written programs. Program identification can be numbered from 01 to 99.

CPU Interrupt - can automatically occur during offline programs in order to receive an unsolicited CPU message. The message is stored on diskette storage (or, under certain conditions, printed on the console printer) and the offline program is automatically resumed. A manual switch on the keyboard enables/disables this mode of operation.

Address Stop Function - is provided to facilitate debugging of 3770 application programs at the terminal site. The status of program resources at the stop-address can be outputted to printer or display.

Bibliography: GC20-0001

Specify: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. Note: Available at time of manufacture only.

[3] Remote Power Off: #9501 ... specify this feature for capability to power down terminal from the host CPU using a controlled data sequence sent over communication facilities.

[4] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual - Physical Planning, GA27-3006.

[5] Emulator: #9141 ... specify this feature to equip the terminal with the non-programmable function in lieu of the standard programmable function. Non-programmable notation on the keyboard and operator panel is provided by this feature. **Field Installation:** Not recommended. It can be field removed to change the terminal from non-programmable to programmable function.

[6] Alternate Address: #9011 ... Order this optional feature to specify that diskettes containing terminal control code engineering changes are to be mailed to an alternate address using a Teleprocessing Control number. The alternate address selected is usually the central site location. Limitations: [1] For models P1, P2 only ... [2] Not with Emulator (#9141) ... [3] Each EC control diskette has been manufactured for use on the specific machine type/serial shown on the diskette label. EC diskettes for the 3774 terminal are unconfigured when they are mailed from IBM and have 23 tracks of storage available for user data. After the diskette is configured on the machine type/serial on which it is to be used, the amount of storage for user data is as follows: 30 tracks - configured to not use programmable communications SDLC ... 28 tracks - configured to use programmable communications SDLC. For additional information, see "Data Set Support" in the *Operator's Guide*, GA27-3114.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
3774	1†	\$310	\$264	\$10,560	\$71.50
	2†	350	298	11,920	81.00
	P1	310	264	10,560	117.00
	P2	350	298	11,920	125.00

Plan Offering: Plan B Machine Group: D Per Call: 1
Warranty: B Purchase Option: 45%
Useful Life Category: 2 Termination Chg Mnths: 5
Termination Chg Percent: 25% Upper Limit Percent: 0%

Model Changes: Field Installable ... for 3774 Models 1 and 2 on an "As Available" basis **Limitation:** Model downgrades from programmable models to non-programmable models are not permitted.

† No longer available.

**3774 Communication Terminal (cont'd)****MODEL UPGRADE PURCHASE PRICES** (There are no additional installation charges).

Model 1 to Model 2	\$2,300
Model 1 to Model P1	4,900
Model 1 to Model P2	6,260
Model 2 to Model P2	4,900
Model P1 to Model P2	1,360

SPECIAL FEATURES

All special features can be field installed, except #1201 and #4660 for which field installation is not recommended. Special features for 3774 mdl's 1 and 2 are on an "As Available" basis for field installation.

FOR COMMUNICATION CAPABILITY -- select one Communication Feature (#1460, 1461 or 1470) ... one Communication Driver (#1481 or 1482) ... and one Integrated Modem (#5500, 5501, 5502, 5600, 5602 or 5610) or EIA Interface (#3701). #1462 is required in addition to #1460 or #1461 for multipoint operation using BSC.

COMMUNICATION FEATURE... one can be selected.

SDLC/BSC, SWITCH CONTROL (#1460). Provides communication procedure using SDLC or BSC under operator switch control. SDLC allows point-to-point or multipoint operation. BSC operation is point-to-point without #1462, multipoint with #1462. **Maximum:** One. **Limitation:** Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461). Provides for point-to-point BSC operation over switched or non-switched facilities. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched and non-switched SDLC procedures. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1461. For record purposes also identify the primary CPU/Program Environment Code. Specify one of the following: #9977 for DOS/VS VTAM, #9988 for OS/VS1 VTAM, #9989 for OS/VS2 VTAM, or #9993 for all other combinations of operating systems and access methods.

BSC MULTIPOINT (#1462). Required for BSC multipoint operation over non-switched facilities. **Maximum:** One. **Prerequisite:** #1460 or #1461. **Limitation:** See SRL GA27-3097 for BSC compatibility considerations.

COMMUNICATION DRIVER ... one can be selected.

WITHOUT BUSINESS MACHINE CLOCKING (#1481). Provides communication driver without clocking. **Maximum:** One. **Prerequisite:** Communication Feature #1460, #1461, or #1470. **Limitation:** Cannot be installed with #1482.

WITH 1200 BPS BUSINESS MACHINE CLOCKING (#1482). Provides communication driver with 1200 bps clocking. **Maximum:** One. **Prerequisite:** Communication Feature #1460, #1461 or #1470. **Limitation:** Cannot be installed with #1481.

EIA INTERFACE OR INTEGRATED MODEM ... one can be selected.

EIA INTERFACE (#3701). Provides a cable and interface meeting RS-232C characteristics for attachment of an IBM Modem or non-IBM data set. Speeds up to 4800 bps for switched or non-switched operation are permitted. This feature in combination with #1481 can be used to attach to Modem Fan-out (#3901) on an adjacent terminal, or on an IBM 3863, 3864, 3872 or 3784 Modem. This feature in combination with #1482 can be used for direct attachment to a 3704 or 3705 equipped with Local Attachment (#4716) for operation at 1200 bps synchronous. **Maximum:** One. **Prerequisite:** Communication Driver (#1481 or #1482). **Limitation:** Cannot be installed with any Integrated Modem feature.

1200 BPS INTEGRATED MODEM, NON-SWITCHED (#5500). Provides for point-to-point or multipoint operation over non-switched communication facilities. **Maximum:** One. **Prerequisite:** Communication Driver (#1482). **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, AUTO ANSWER (#5501). Provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. **Maximum:** One. **Prerequisite:** Communication Driver (#1482). The user must provide a Data Coupler type CBS or equivalent. **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, MANUAL ANSWER (#5502). Provides for point-to-point operation over switched network facilities using manual originate/manual answer for establishing connection. **Maximum:** One. **Prerequisite:** Communication Driver (#1482). The user must provide a Data Coupler type CDT or equivalent. **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, POINT-TO-POINT (#5600). This self-clocked modem provides for point-to-point operation over non-switched communication facilities. Operator controls provide for half-speed operation and for adjusting receive equalization. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, MULTI-POINT (#5602). This self-clocked modem provides for multipoint operation over non-switched communication facilities. Operator controls provide for half-speed operation and for adjusting transmit and receive equalization. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, SWITCHED WITH AUTO ANSWER (#5610). This self-clocked modem provides for point-to-point operation over switched communication facilities using manual originate/auto answer for establishing connection. Operator controls provide for half-speed operation. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). The user must provide a Data Coupler type CBS or equivalent. **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

SUB-FEATURES FOR 2400 BPS INTEGRATED MODEMS

SWITCHED NETWORK BACK-UP (#7951). Provides the capability of attaching 2400 BPS Integrated Modem (#5600 or #5602) to the switched network facility as back-up to the primary non-switched facility. Operation over the switched network is in manual originate/manual answer mode to establish the connection. It can communicate at 2400/1200 bps with an IBM 3872 Modem equipped for operation over the public switched network (#7941, #7951 or #7952) attached to a 3704, 3705 or ICA of 3115 or 3125. **Note:** To use this feature operator intervention at the terminal is required. Operation intervention, program modification, or both may be required on the using system. This feature can be used with BTAM programs for DOS/VS, OS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required in existing BTAM programming to full utilize the capabilities of this feature. **Maximum:** One. **Prerequisite:** 2400 BPS Integrated Modem, Non-Switched (#5600 or #5602). The user must provide a Data Coupler type CDT or equivalent. **Limitation:** Cannot be installed with #3701.

MODEM FAN-OUT (#3901). Equips the 2400 BPS Integrated Modem, Non-Switched (#5602) with the capability to be shared by up to two other terminals in addition to the host. **Maximum:** One. **Prerequisite:** 2400 BPS Integrated Modem (#5602). **Limitation:** This feature can be used at a tributary station in a centralized multipoint network. In this configuration BSC multipoint programming discipline or SDLC non-switched programming discipline will provide the selection/control of the terminal without any additional user involvement.

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with diskette storage features and 3784 Printer Attachment Feature, and with BSC features #1460, #1461 or #1462, or with SDLC features #1460 or #1470. **Maximum:** One. **Field Installation:** Not Recommended. **Limitation:** [Programmable Models Only] The GETKB programming statement cannot be used in programs that are to be run on an ASCII machine.

AUDIBLE ALARM (#1390). Sounds an alarm to alert the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. **Maximum:** One.

DISPLAY (#3250). Provides a 480 character (12 lines of 40 characters each) information display under control of the 3770 application program. **Maximum:** One. **Prerequisite:** Model P1 or P2. **Limitations:** Not available for model 1 or 2. This feature cannot be installed with Emulator (#9141).

DOOR KEYLOCK (#3401). Provides a keylock and two keys for the desk-console door. **Maximum:** One. **Limitation:** The keys provided with this lock can be duplicated by local key makers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for the desk-console cabinet doors. **Maximum:** One. **Prerequisite:** Diskette Storage, 2nd (#4902). **Limitation:** The keys provided with this lock can be duplicated by local key makers. Additional or replacement keys are not available from IBM.

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with this feature. Refer to M 10000 pages for information on additional or replacement keys. **Maximum:** One.

KEYPAD, NUMERIC (#4660). Provides a keypad in adding machine arrangement to facilitate rapid entry of numeric only data.



3774 Communication Terminal (cont'd)

Maximum: One. **Prerequisite:** Model P1 or P2. **Field Installation:** Not recommended. **Limitations:** Not available for Model 1 or 2. This feature cannot be installed with Emulator (#9141).

DISKETTE STORAGE, 1ST (#4901). One device with a customer removable diskette is placed in the left cabinet. Additional diskettes are available

Characteristics of the diskette storage device are: one movable read/write head, one read/write surface, 73 data tracks, 26 sectors per track and 128 bytes per sector. Up to 949 256-byte records can be stored on the diskette (one 256-byte record is reserved for job identification information) in the 3774 mdl 1 and 2. Each 256-byte record is stored in two consecutive numbered sectors in interchange mode, or in two non-consecutive sectors in 3770 mode. Diskette data is code insensitive in SDLC, non-transparent only in BSC mode (3774 mdl 1 or 2). An Update Switch on the 3774 mdl 1 or 2 provides the operator with the capability of reading a 256-byte diskette record into the terminal buffer where it can be printed, edited or deleted. **Maximum:** One.

DISKETTE STORAGE, 2ND (#4902). Provides a second diskette storage device with the same characteristics as the 1st. It is placed in the right desk cabinet which is also supplied by this feature. The second diskette allows additional capabilities for:

Copy - data can be copied from diskette 1 to diskette 2 (single data set or all active data sets.)

Concatenate (pool) - the ability to concatenate on a data set basis.

Continue (3774 mdl 1 or 2) - allows a read or write operation to automatically continue to diskette 2 if it has been placed in a ready condition. Continue is not allowed while keying data.

Record Update (3774 mdl 1 or 2) - allows a record to be read into the buffer from diskette 1, updated from keyboard, and written to the other diskette. Record Format Feature (#6010) is a prerequisite for this update capability.

Maximum: One. **Prerequisite:** Diskette Storage, 1st (#4901). **Orders for Field Installation:** Must specify color - #9081 for red, #9082 for yellow, #9083 for blue, or #9085 for gray ... color must be the same as that specified for the base machine.

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read.

With a BSC non-programmable terminal, a read operation can be initiated during a keyboard to line job only. Data read from the magnetic stripe card cannot be printed. For a programmable terminal the Operator ID Reader is under control of the 3770 application program. **Maximum:** One. **Limitation:** The operator must position and slide the card through the read-slot at a steady rate between 5 and 40 inches per second for a read operation. BSC programming for 2770 does not support this feature.

RECORD FORMAT FEATURE (#6010). Provides an offline capability for constructing records using more than one input and output device. Input can be keyboard and either diskette or an attached card reader. Output can be console printer and either diskette or an attached card punch. A record format specification record stored on diskette can be defined and changed by the user to permit selection by field for merging and creating, in any sequence within a transaction cycle. It also permits selecting output by field. There may be multiple fields within a transaction and multiple transaction cycles within a job. Provision is also made with this feature for self-checking, decimal insertion, right justify and fill, and numeric checking.

A record format specification record can be loaded to diskette from the line, keyboard, or card reader.

This feature increases the size of "extend buffer" from 512 to 2048 bytes. **Maximum:** One. **Prerequisites:** For 3774 mdls 1 and 2 - Diskette Storage 1st (#4901) ... For 3774 mdls P1 and P2 - Diskette Storage 1st (#4901) and Emulator (#9141). **Limitations:** Extend buffer and update operation is not permitted for a record format job. A record format job cannot be interrupted by the CPU automatically, operator intervention is required. This feature is not compatible with terminal programmability and will be removed from model P1 and P2 whenever Emulator (#9141) is removed.

STORAGE INCREMENT, 4K (#6800). Provides an additional 4096 bytes of programmable storage. **Maximum:** One. **Prerequisite:** Model P1 or P2. **Limitations:** Not available for mdls 1 or 2, or with features #6801, #6802 or #6803. This feature cannot be installed with Emulator (#9141).

STORAGE INCREMENT, 8K (#6801). Provides an additional 8192 bytes of programmable storage. **Maximum:** One. **Prerequisite:** Model P1 or P2. **Limitations:** Not available for mdls 1 or 2, or with #6800, #6802 or #6803. This feature cannot be installed with Emulator (#9141).

STORAGE INCREMENT, 12K (#6802). Provides an additional 12,288 bytes of programmable storage. **Maximum:** One. **Prerequisite:** Model P1 or P2. **Limitations:** Not available for mdls

1 or 2, or with #6800, #6801 or #6803. This feature cannot be installed with Emulator (#9141).

STORAGE INCREMENT, 16K (#6803). Provides an additional 16,384 bytes of programmable storage. **Maximum:** One. **Prerequisite:** Model P1 or P2. **Limitations:** Not available for mdls 1 or 2, or with #6800, #6801 or #6802. This feature cannot be installed with Emulator (#9141).

3501 CARD READER ATTACHMENT (#8050). Provides an attachment of the 3501 Card Reader. **Maximum:** One. **Limitation:** Cannot be installed with 3782/2502 Card Reader Attachment (#8149).

3782/2502 CARD READER ATTACHMENT (#8149). To attach a 3782 Card Attachment Unit mdl 2 and a 2502 Card Reader mdl A1 or A2. The 2502 can be equipped with special features for 51/80 or 66/80 column cards and/or Optical Mark Read. A companion OMR special feature is required on the 3782 mdl 2. **Maximum:** One. **Limitation:** Cannot be installed with 3501 Card Reader Attachment (#8050).

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. **Maximum:** One. **Limitation:** (Non-programmable mdls only) If a 2502 or 3501 Card Reader is also attached (#8149 or #8050), the Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only.

3784 PRINTER ATTACHMENT (#8155). To attach a 3784 Line Printer as a second printer. **Maximum:** One.

VARIABLE WIDTH FORMS TRACTOR (#8700). Provides a forms feeding device for continuous edge-punched forms. Overall forms width from 3" to 15" can be fed. Refer to Forms Design Reference Guide for Printers, GA-3488. **Maximum:** One.

Special Feature Prices:	ETP/		Purchase	MMMC	
	MAC/ MRC	MLC 2 Yr			
Communication Feature					
SDLC/BSC Switch Cntl	#1460	\$25	\$21	\$840	\$5.50
BSC, Pt-to-Pt	1461	15	13	520	3.00
SDLC	1470	13	11	440	3.00
BSC Multipt	1462	13	11	440	1.00
Communication Driver					
w/o Bus Mch Clocking	1481	13	11	440	2.00
w 1200 Bps Clocking	1482	15	13	520	3.00
EIA Interface	3701	13	11	440	1.00
1200 Bps Integrated Modem					
Non-Switched	5500	19	16	668	4.00
Switched, Auto Answer	5501	25	21	840	4.00
Switched, Mnl Answer	5502	19	16	668	4.00
2400 BPS Integrated Modem					
Non-switched, Pt-t-Pt	5600	68	58	2,320	5.00
Non-switched, Multipt	5602	74	63	2,520	5.00
Switched w Auto Answer	5610	74	63	2,520	6.00
Switched Network Backup	7951	11	9	360	.50
Modem Fan-out	3901	21	18	720	1.00
ASCII Feature	1201	18	15	600	.50
Audible Alarm	1390	40	SUC -	40	.50
Display	3250	94	80	3,200	34.50
Door Keylock	3401	15	SUC -	15	NC
Door Keylock, Dual	3402	30	SUC -	30	NC
Keylock	4650	35	SUC -	35	NC
Keypad, Numeric	4660	12	10	400	2.00
Diskette Storage, 1st	4901	69	59	2,360	16.50
Diskette Storage, 2nd	4902	69	59	2,360	7.00
Operator ID Reader	5450	13	11	440	1.50
Record Format Feature	6010	25	21	840	4.50
Storage Increment, 4K	6800	18	15	351*	4.50
Storage Increment, 8K	6801	32	27	637*	6.50
Storage Increment, 12K	6802	45	38	910*	11.00
Storage Increment, 16K	6803	58	49	1,170	13.00
3501 Cd Rdr Attachment	8050	13	11	440	.50
3782/2502 Cd Rdr Attach	8149	19	16	640	4.00
3782/3521 Cd Pch Attach	8150	19	16	640	3.50
3784 Printer Attachment	8155	19	16	640	.50
Variable Wdth Fms Trctr	8700	6	5	160	.50

* Customers who elect to purchase one of these features and anticipate later ordering additional storage, should consider purchase of the larger storage initially because field upgrade requires replacement of the initial feature.

ACCESSORIES: For Forms Stand (#4450) ... see page 3775.4.

**IBM 3775 COMMUNICATION TERMINAL**

[3775 Model 1 is no longer available]

Purpose: This desk-style console-keyboard-printer is a member of the 3770 Data Communication System. The basic printer operates at a maximum speed of 120 lines per minute using a 64 character set or 80 lpm using a 94 character set. An engraved character font print belt can be interchanged by the operator. Special features permit one or two diskette storage devices and provide for the attachment of one card reader and one card punch. One of three card readers can be selected for operation at speeds of 50, 150 or 300 cards per minute. The card punch operates at 50 cpm.

Communication features allow for operation over switched or non-switched facilities at speeds up to 4800 bps using SDLC or BSC transmission techniques and a appropriate modem.

Model 1 Non-programmable
Model P1 User programmable

Highlights**All Models**

Keyboard -- EBCDIC arrangement with 44 data keys (produces 88 characters). Underscore/Hyphen, Backspace, Space and "Print Character" ("Character" on programmable models) keys have typamatic operation. Associated with the keyboard are indicator lights, function keys, operating mode switches and a 3-position numeric display.

Printer -- during a key entry job, the print platen lowers to provide print line visibility. Printing is from characters engraved on a revolving print belt. Included as standard is one interchangeable print belt (either 64 or 94 character set), variable width forms tractor for feeding continuous forms up to 15 inches overall width, paper jam detection, and 132 print positions. Character spacing is 10 per inch, line spacing is 6 or 8 per inch. Maximum print speed is 120 lines per minute with the 64 character set, or 80 lines per minute with the 94 character set. Continuous card stock forms are not recommended. Refer to GA24-3488 for forms design considerations.

Performance Considerations -- actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application processing, etc., must all be considered in determining actual throughput. See *IBM 3770 Communication System, GA27-3097*, for additional information.

Problem Determination Procedures -- significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem identification and recovery routines and procedures that are easily understood and used by the operator. See *IBM 3774/3775 Operating Procedures Guide, GA27-3094* or *IBM 3773, 3774 and 3775 Programmable Communication Terminals Operator's Guide, GA27-3114*.

Communications -- see "Special Features." Transmission speeds up to 4800 bps over switched or non-switched facilities are allowed by selecting the appropriate modem and communication facility. Refer to M 2700 pages for information on communication facilities and other attachment facilities. Also refer to 3872 and 3874 in configured can be intermixed on the same communication facility.

Supplies -- a black ribbon. IBM Part No. 1136634, or equivalent, is required

Customer Responsibilities -- it will be a customer's responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Prerequisites:

For SDLC Communications with S/370 or 4300 Processor -- a 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or these operating systems running under VM/370 (OS/VS2 is not supported by the 4300 Processors).

For BSC Communications with S/360 or S/370 or 4300 Processors -- a virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2 or under RSCS (non-programmable terminals only) and VM/370, or any of these operating systems running under VM/370 (OS/VS2 is not supported by the 4300 Processors). The 3770 Communication Terminals use 2770 BSC programming support when operating in BSC mode. See SRL GA27-3097 for BSC compatibility considerations. The customer may have to modify existing 2770 application programs for operation with non-programmable models of the 3770. The customer will have to modify existing application

programs for operation with programmable models of the 3770. BSC attachment can be made via a 3704/3705 Communications Controller or a 2701 Data Adapter Unit attached to a channel of any S/370 or 4300 Processor; or via an Integrated Communications Adapter on S/370 mdl 115, 125, 135, 135-3, or 138; or via a Communications Adapter feature on the 4331 Processor. BSC attachment can be made via a 3704/3705 attached to a channel of a S/360 mdl 30, 40, 50, 65, 67 (in 65 mode), 75 and 195; via a 2701 attached to a channel of a S/360 mdl 22, 25, 30, 40, 44, 50, 65, 67 (in 65 mode), 75 and 195; or via an Integrated Communications Attachment on S/360 mdl 25.

Non-programmable Model and Programmable Model with Emulator Specify Feature

Dual 256-Byte Buffers -- transfer data between the input and output devices. The buffers alternate in providing input and output service to permit overlapped operation.

Buffer Edit -- allows corrections to be made on the contents of a buffer during key entry jobs. A 256-byte diskette record, if the diskette feature is present, can also be retrieved into the buffer using Update Mode and be corrected using buffer edit functions. Corrections can be made by character, by line or by entire buffer (up to 256 bytes).

Extend Buffer -- combines the dual 256-byte buffers into a single 512-byte buffer under operator control for keyboard to line or keyboard to diskette jobs. Buffer edit capability applies to the full 512 bytes. Buffer transfers to line or diskette are in 256-byte increments and cannot be overlapped.

Printer Format Controls -- facilitate the formatting of printed data. Vertical and horizontal control characters in data initiate vertical or horizontal tabbing. Format controls for up to five jobs can be entered from keyboard, or from diskette or card if either one of these devices is attached.

Compression/Expansion -- provides a means for improving the efficiency of data transmission. For BSC, the compression option can be invoked at the terminal for a job that reads non-transparent data from cards. A two byte sequence is substituted for each occurrence of three or more consecutive blank card columns (63 consecutive blanks is the upper limit). A second two-byte sequence is appended if more than 64 consecutive blank columns are read. The terminal monitors received non-transparent data that is destined for the printer or attached card punch and automatically expands this two-byte sequence to the correct number of blanks. A similar capability is provided when using SDLC procedures.

Auto Interrupt -- allows the terminal to automatically interrupt an offline job for an online job initiated by the host CPU. The terminal stops the offline job, executes the online job for receiving line data and automatically restarts the offline job without operator intervention. A manual switch on the keyboard enables/disables this mode of operation. See *Operating Characteristics - Automatic Interrupt in 3770 System Components Manual, GA27-3097*.

Input/Output Job Definitions -- can be operator or terminal defined. Up to five operator defined jobs can be read from diskette or card reader to facilitate rapid job set-up when the terminal is equipped with either of the special features, otherwise they can be entered from the keyboard under control of a prompting sequence and executed from temporary storage. Printer format controls can be part of the job definition. An appropriately configured 3775 will permit job designation as follows:

Offline Jobs

Input	Output
Keyboard*	Console Printer, Diskette or Card Punch
(1) Diskette	Console Printer, Diskette or Card Punch
(1) Card Reader	Console Printer, Diskette or Card Punch
(2) Keyboard & Diskette	Console Printer & either Diskette or Card Punch
(2) Keyboard & Card Reader	Console Printer & either Diskette or Card Punch

Online Batch Jobs

(1) Diskette or Card Reader	Line
(1) Line	Console Printer, Diskette & Card Punch

Online Interactive Jobs

Keyboard*	Line
Line	Console Printer

* One input and one output device per job. Output to console printer is automatic when input is keyboard.

- (1) One input device and one output device per job. Monitor print is an additional option when diskette, card punch or line is the output device.
- (2) Record Format Feature (#6010) is required in addition to I/O devices to allow multiple input and output devices for a job.



3775 Communication Terminal (cont'd)

Limitations: The input/output capabilities outlined under "Highlights" are dependent on appropriate configurations of the terminal. Keyboard and console printer are standard. For other configurations refer to "Special features" below.

Programmable Model Without Emulator Specify Feature

Offline Operations -- are controlled by a user written program. The 3775 interprets the user written program after it is loaded to program storage from diskette storage. The 3775 has 6K bytes of program storage as standard. Additional 4K, 8K, 12K or 16K bytes of program storage are available by special feature to a maximum of 16K additional bytes of program.

A program can be selected and invoked by the operator, by a prior program call, or by an auto execute command from the host CPU. Valid data sources for offline operations are the Operator ID Reader, keyboard, diskette storage and card reader. Valid data output devices are the console printer, diskette storage, card punch and display.

3775P system utilities provide additional capabilities for the following operations:

- Card reader to console printer, diskette or card punch.
Card print (Read Interpret).
Keyboard to card punch.
Create, copy, list diskette.
Data set support for bypass, create, delete, erase, rename and write protect data set.
Data set update for create, read, write and dump data set.
Copy data set.
Program library support.
Set date.
Set Configuration.

Storage Considerations -- storage is used for executing a 3770 application program that is loaded from diskette, for Communications Mode, for data buffers, and for execution of device-related functions that are specified by the opening statement in the application program. Storage may also be allocated for devices and functions at power on time through options available in the Terminal Configuration Utility. The amount of storage required for devices or functions is:

Table listing storage requirements for various components like Supervisor Control Code Resident, Programmable Communications - BSC, etc.

The amount of storage required is also dependent upon the following variables.

Table showing size of 3770 application program and working storage for tables, storage to storage operations, buffers, etc., including 0.75K bytes for basic three buffers.

Online Communications Operation -- terminals equipped with the appropriate I/O and Communications features can operate as follows:

Transmission is controlled by the Communications Mode function or by a user written program using the Programmable Communications function. Communicate Mode provides for selection of diskette data sets, card reader or keyboard (Logon) for input data. Output data can be directed to a diskette dataset, card punch or console printer. Support is provided for printer horizontal and vertical format control. The Programmable Communications capability allows for transmission of data with any I/O device under control of a user written program.

Diskette Storage Device -- with 99,840 bytes of storage is standard on a non-removable diskette. Characteristics of the non-removable diskette are one read/write surface, 30 data tracks, 26 sectors per track, and 128 bytes per sector. Up to 390 256-byte records or up to 780 128-byte records can be stored on the non-removable diskette.

Two additional diskette storage devices providing 242,944 bytes of storage each on removable, reusable diskettes are provided by special feature.

The diskettes can be used for storage of application programs and for application data. The maximum number of user written data sets that can reside on the non-removable diskette and on each removable diskette is 18. A maximum of 7 data sets can be opened for any one program. A program library data set can contain a maximum of 99 user written programs. Program identification can be numbered from 01 to 99. Programmable communication (SDLC) reduces the amount of storage for user data from 30 to 28 tracks.

CPU Interrupt -- can automatically occur during offline programs in order to receive an unsolicited CPU message. The message is stored on diskette storage (or, under certain conditions, printed on the console printer) and the offline program is automatically resumed. A manual switch enables/disables this mode of operation.

Address Stop Function -- is provided to facilitate debugging of 3770 application programs at the terminal site. The status of program resources at the stop-address can be outputted to printer or display.

Bibliography: GC20-0001

Specify: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. Note: Available at time of manufacture only.

[3] Remote Power Off: #9501 ... specify this feature for capability to power down terminal from the host CPU using a controlled data sequence sent over communication facilities.

[4] Print Belt Character Set: Specify one. Available at time of manufacture only. See Print Belts in M 10000 pages if more than one print belt is required. #9491 for 64 Character Set EBCDIC, #9492 for 94 Character Set EBCDIC, #9494 for 64 Character Set ASCII, or #9495 for 94 Character Set ASCII. #9494 and #9495 require ASCII Feature (#1201).

[5] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual - Physical Planning, GA27-3006.

[6] Emulator: #9141 ... specify this feature to equip the terminal with the non-programmable function in lieu of the standard programmable function. Non-programmable notation on the keyboard and operator panel is supplied by this feature. Field Installation: Not recommended. It can be field removed to change the terminal from non-programmable to programmable function.

[7] Alternate Address: #9011 ... for RECORD PURPOSES only ... Order this optional feature to specify that diskettes containing terminal control code engineering changes are to be mailed to an alternate address using a Teleprocessing Control number. The alternate address selected is usually the central site location. Field installable. Limitations: [1] For model P1 only ... [2] Not with Emulator (#9141) ... [3] Each EC control diskette has been manufactured for use on the specific machine type/serial shown on the diskette label. EC diskettes for the 3775 terminal are unconfigured when they are mailed from IBM and have 23 tracks of storage available for user data. After the diskette is configured on the machine type/serial on which it is to be used, the amount of storage for user data is as follows: 30 tracks - configured to not use programmable communications SDLC ... 28 tracks - configured to use programmable communications SDLC. For additional information, see "Data Set Support" in the Operator's Guide, GA27-3114.

Table with columns: PRICES, Mdl, MAC/MRC, ETP/MLC 2 Yr, Purchase, MMMC. Row for model 3775 P1.

Plan Offering: Plan B Machine Group: D Per Call: 1
Purchase Option: 45% Warranty: B Useful Life Category: 2
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Upper Limit Percent: 0%

Model Changes: Field installable ... for Model 1 on an "As Available" basis. Limitation: Model downgrade from model P1 to model 1 is not permitted.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 1 to Model P1\$4,900
SPECIAL FEATURES

All special features can be field installed, except #1201, #3551 and #4660 for which field installation is not recommended. Special features for 3775 model 1 are on an "As Available" basis for field installation.

For Communication Capability -- select one Communication

† No longer available.

**3775 Communication Terminal** (cont'd)

Feature (#1460, 1461 or 1470) ... one Communication Driver (#1481 or 1482) ... one Integrated Modem (#5500, 5501, 5502, 5600, 5602 or 5610) or EIA Interface (#3701). #1462 is required in addition to #1460 or #1461 for multipoint operation using BSC.

COMMUNICATION FEATURE ... one can be selected.

SDLC/BSC, SWITCH CONTROL (#1460). Provides communication procedure using SDLC or BSC under operator switch control. SDLC allows point-to-point or multipoint operation. BSC operation is point-to-point without #1462, multipoint with #1462. **Maximum:** One. **Limitation:** Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461). Provides for point-to-point BSC operation over switched or non-switched facilities. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched and non-switched SDLC procedures. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1461. For record purposes also identify the primary CPU/Program Environment code. Specify one of the following: #9977 for DOS/VS VTAM, #9988 for OS/VS1 VTAM, #9989 for OS/VS2 VTAM, or #9993 for all other combinations of operating systems and access methods

BSC MULTIPOINT (#1462). Required for BSC multipoint operation over non-switched facilities. **Maximum:** One. **Prerequisite:** #1460 or #1461. **Limitation:** See SRL GA27-3097 for BSC compatibility considerations.

COMMUNICATION DRIVER ... one can be selected.

WITHOUT BUSINESS MACHINE CLOCKING (#1481). Provides communication driver without clocking. **Maximum:** One. **Prerequisite:** Communication Feature (#1460, 1461 or 1470). **Limitation:** Cannot be installed with #1482.

WITH 1200 BPS BUSINESS MACHINE CLOCKING (#1482). Provides communication driver with 1200 bps clocking. **Maximum:** One. **Prerequisite:** Communication Feature (#1460, 1461 or 1470). **Limitation:** Cannot be installed with #1481.

EIA INTERFACE OR INTEGRATED MODEM ... one can be selected.

EIA INTERFACE (#3701). Provides a cable and interface meeting RS-232C characteristics for attachment of an IBM Modem or non-IBM modem. Speeds up to 4800 bps for switched or non-switched operation are permitted. This feature in combination with #1481 can be used to attach to Modem Fan-out (#3901) on an adjacent terminal, or on an IBM 3863, 3864, 3872 or 3874 Modem. This feature in combination with #1482 can be used for direct attachment to a 3704 or 3705 equipped with Local Attachment (#4716) for operation at 1200 bps synchronous. **Maximum:** One. **Prerequisite:** Communication Driver (#1481 or 1482). **Limitation:** Cannot be installed with any Integrated Modem feature.

1200 BPS INTEGRATED MODEM, NON-SWITCHED (#5500). Provides for point-to-point or multipoint operation over non-switched communication facilities. **Maximum:** One. **Prerequisite:** Communication Driver with Clock (#1482). **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, AUTO ANSWER (#5501). Provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. **Maximum:** One. **Prerequisite:** Communication Driver (#1482). The user must provide a Data Coupler type CBS or equivalent. **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, MANUAL ANSWER (#5502). Provides for point-to-point operation over switched network facilities using manual originate/manual answer for establishing connection. **Maximum:** One. **Prerequisite:** Communication Driver (#1482). The user must provide a Data Coupler type CDT or equivalent. **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, POINT-TO-POINT (#5600). This self-clocked modem provides for point-to-point operation over non-switched communication facilities. Operator controls provide for half-speed operation and for adjusting receive equalization. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, MULTIPOINT (#5602). This self-clocked modem provides for multipoint operation over non-switched communication facilities. Operator controls provide for half-speed operation and for adjusting transmit and receive equalization. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, SWITCHED WITH AUTO ANSWER #5610. This self-clocked modem provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. Operator controls provide for half-speed operation. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). The user must provide a Data Coupler type CBS or equivalent. **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

SUB-FEATURES FOR 2400 BPS INTEGRATED MODEMS

SWITCHED NETWORK BACK-UP (#7951). Provides the capability of attaching 2400 BPS Integrated Modem (#5600 or 5602) to the switched network facility as a back-up to the primary non-switched facility. Operation over the switched network is in manual originate/manual answer mode to establish the connection. It can communicate at 2400/1200 bps with an IBM 3872 Modem equipped for operation over the public switched network (#7941, 7951 or 7952) attached to a 3704, 3705, or ICA of 3115 or 3125. **Note:** To use this feature operator intervention at the terminal is required. Operator intervention, program modification, or both may be required on the using system. This feature can be used with BTAM programs for DOS/VS, OS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required in existing BTAM programming to fully utilize the capabilities of this feature. **Maximum:** One. **Prerequisite:** 2400 BPS Integrated Modem, Non-Switched (#5600 or 5602). The user must provide a Data Coupler type CDT or equivalent. **Limitation:** Cannot be installed with #3701.

MODEM FAN-OUT (#3901). Equips the 2400 BPS Integrated Modem, Non-Switched, Multipoint (#5602) with the capability to be shared by up to two other terminals in addition to the host. **Maximum:** One. **Prerequisite:** #5602. **Limitation:** This feature can be used at a tributary station in a centralized multipoint network. In this configuration, BSC multipoint programming discipline or SDLC non-switched programming discipline will provide the selection/control of the terminal without any additional involvement.

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with diskette storage features and with BSC features #1460, 1461 or 1462; or with SDLC features #1460 or #1470. Orders for #1201 must also specify one print belt, #9494 for 64 character ASCII or #9495 for 94 character ASCII ... see "Specify." **Maximum:** One. **Field Installation:** Not recommended. **Limitation:** The GETKB programming statement cannot be used in programs that are to be run on an ASCII machine.

Audible Alarm (#1390). Sounds an alarm to alert the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. **Maximum:** One.

DISPLAY (#3250). Provides a 480 character (12 lines of 40 characters each) information display under control of the 3770 application program. **Maximum:** One. **Prerequisite:** Model P1. **Limitation:** Not available for model 1. This feature cannot be installed with Emulator (#9141).

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. **Maximum:** One. **Limitation:** The keys provided with this lock can be duplicated by local key makers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for both desk-console cabinet doors. **Maximum:** One. **Prerequisite:** Diskette Storage, 2nd (#4902). **Limitation:** The keys provided with this lock can be duplicated by local key makers. Additional or replacement keys are not available from IBM.

DUAL INDEPENDENT FORMS FEED (#3551). [3775 mdl P1 only] Provides two independently indexed pin feed mechanisms on the console line printer with visibility platen. They operate under control of a 3775 application program. Different sizes of forms can be handled in each paper feed. Refer to GA24-3488 for forms design considerations. **Maximum:** One. **Field Installation:** Not recommended. **Limitation:** This feature cannot be installed with Emulator (#9141).

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with this feature. Refer to M 10000 pages for information on additional or replacement keys. **Maximum:** One.

KEYPAD, NUMERIC (#4660). Provides a keypad in adding machine arrangement to facilitate rapid entry of numeric only data. **Maximum:** One. **Prerequisite:** Model P1. **Field Installation:** Not recommended. **Limitations:** Not available for mdl 1 ... this feature cannot be installed with Emulator (#9141).

DISKETTE STORAGE, 1ST (#4901). One device with a customer



3775 Communication Terminal (cont'd)

removable diskette is placed in the left cabinet. Additional diskettes are available from IBM ... see IRD Sales Manual. Characteristics of the diskette storage device are: one movable read/write head; one read/write surface; 73 data tracks; 26 sectors per track and 128 bytes per sector. Up to 949 256-byte records can be stored on the diskette (one 256-byte data record is reserved for job identification in a 3775 model 1). Each 256-byte record is stored in two consecutive numbered sectors in interchange mode, or in two non-consecutive sectors in 3770 mode. Diskette data is code insensitive in SDLC mode, non-transparent only in BSC mode (3775 model 1). An Update Switch on the 3775 model 1 provides the operator with the capability of reading a 256-byte diskette record into the terminal buffer where it can be printed, edited or deleted. **Maximum:** One

DISKETTE STORAGE, 2ND (#4902). Provides a second diskette storage device with the same characteristics as the first. It is placed in the right desk cabinet which is also supplied by the feature. The second diskette allows additional capabilities for:

Copy - data can be copied from diskette 1 to diskette 2 (single data set or all active data sets.)

Concatenate (pool) - the ability to concatenate on a data set basis.

Continue (3775 mdl 1) - allows a read or write operation to automatically continue on diskette 2 if it has been placed in ready condition. Continue is not allowed while keying data.

Record Update (3775 mdl 1) - allows a record to be read into the buffer from diskette 1, updated from keyboard, and written to the other diskette. Record Format Feature (#6010) is a prerequisite for this update capability.

Maximum: One. **Prerequisite:** Diskette Storage, 1st (#4901). **Orders for Field Installation:** Must specify color - #9081 for red, #9082 for yellow, #9083 for blue, or #9085 for gray ... color must be the same as that specified for the base machine.

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read.

With a BSC non-programmable terminal, a read operation can be initiated during a keyboard to line job only. Data read from the magnetic stripe card cannot be printed. For programmable terminals the Operator ID Reader is under control of the 3770 application program. **Maximum:** One. **Limitations:** (1) The operator must position and slide the card through the reader-slot at a steady rate between 5 and 40 inches per second for a read operation ... (2) BSC programming for the 2770 does not support this feature.

RECORD FORMAT FEATURE (#6010). Provides an offline capability for constructing records using more than one input and output device. Input can be keyboard and either diskette or an attached card reader. Output can be console printer and either diskette or an attached card punch. A record format specification record stored on a diskette can be defined and changed by the user to permit selection by field for merging or creating, in any sequence within a transaction cycle. It also permits selecting output by field. There may be multiple fields within a transaction and multiple transaction cycles within a job. Provision is also made with this feature for self-checking, decimal insertion, right justify and fill, and numeric checking. A record format specification record can be loaded to diskette from the line, keyboard, or card reader. This feature increases the size of "extend buffer" from 512 to 2048 bytes. **Maximum:** One. **Prerequisites:** For 3775 mdl 1 - Diskette Storage 1st (#4901) ... For 3775 mdl P1 - Diskette Storage 1st (#4901) and Emulator (#9141). **Limitations:** Extended buffer and update operation is not permitted for a record format job. A record format job cannot be interrupted by the CPU automatically, operator intervention is required. This feature is not compatible with terminal programmability and must be removed from a 3775 mdl P1 whenever Emulator (#9141) is removed.

STORAGE INCREMENT, 4K (#6800). Provides an additional 4096 bytes of programmable storage. **Maximum:** One. **Prerequisite:** Model P1. **Limitations:** Not available for model 1, or with features #6801, 6802 or 6803. This feature cannot be installed with Emulator (#9141).

STORAGE INCREMENT, 8K (#6801). Provides an additional 8192 bytes of programmable storage. **Maximum:** One. **Prerequisite:** Model P1. **Limitations:** Not available for model 1, or with features #6800, 6802 or 6803. This feature cannot be installed with Emulator (#9141).

STORAGE INCREMENT, 12K (#6802). Provides an additional 12,288 bytes of programmable storage. **Maximum:** One. **Prerequisite:** Model P1. **Limitations:** Not available for model 1, or with features #6800, 6801 or 6803. This feature cannot be installed with Emulator (#9141).

STORAGE INCREMENT, 16K (#6803). Provides an additional 16,384 bytes of programmable storage. **Maximum:** One. **Prerequisite:** Model P1. **Limitations:** Not available for model 1,

or with features #6800, 6801 or 6802. This feature cannot be installed with Emulator (#9141).

3501 CARD READER ATTACHMENT (#8050). To attach a 3502 Card Reader. **Maximum:** One. **Limitation:** Cannot be installed with 3782/2502 Card Reader Attachment (#8149).

3782/2502 CARD READER ATTACHMENT (#8149). To attach a 3782 Card Attachment Unit mdl 2 and a 2502 Card Reader mdl A1 or A2. The 2502 can be equipped with special features for 51/80 or 66/80 column cards and/or Optical Mark Read. A companion OMR special feature is required on the 3782 mdl 2. **Maximum:** One. **Limitation:** Cannot be installed with 3501 Card Reader Attachment (#8050).

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/ Punch Check and/or Card Print. **Maximum:** One. **Limitation:** (3775 mdl 1 only) If a 2502 or 3501 Card Reader is also attached (#8050 or #8149), the Card Read/ Punch Check special feature on the 3521 is limited to the punch checking function only.

Special Feature Prices:	ETP/		Purchase	MMMC
	MAC/ MRC	MLC 2 Yr		
Communication Feature				
SDLC/BSC Swtch Cntl #1460	\$25	\$21	\$840	\$5.50
BSC Pt-to-Pt 1461	15	13	520	3.00
SDLC 1470	13	11	440	3.00
BSC Multipoint 1462	13	11	440	1.00
Communication Driver				
w/o Bus Mch Clkg 1481	13	11	440	2.00
w 1200 BPS Clocking 1482	15	13	520	3.00
EIA Interface 3701	13	11	440	1.00
1200 BPS Integrated Modem				
Non-Switched 5500	19	16	668	4.00
Switched, Auto Answer 5501	25	21	840	4.00
Switched, Mnl Answer 5502	19	16	668	4.00
2400 BPS Integrated Modem				
Non-Switched, Pt-to-Pt 5600	68	58	2,320	5.00
Non-Switched, Multipt 5602	74	63	2,520	5.00
Switched w Auto Ans 5610	74	63	2,520	6.00
Switched Ntwk Bkup 7951	11	9	360	.50
Modem Fan-Out 3901	21	18	720	1.00
ASCII Feature 1201	18	15	600	.50
Audible Alarm 1390	40 SUC -		40	.50
Display 3250	94	80	3,200	34.50
Door Keylock 3401	15 SUC -		15	NC
Door Keylock, Dual 3402	30 SUC -		30	NC
Dual Ind Fms Feed 3551	29	25	1,000	11.00
Keylock 4650	35 SUC -		35	NC
Keypad, Numeric 4660	12	10	400	2.00
Diskette Storage, 1st 4901	69	59	2,360	16.50
Diskette Storage, 2nd 4902	69	59	2,360	7.00
Operator ID Reader 5450	13	11	440	1.50
Record Format Feature 6010	25	21	840	4.50
Storage Increment, 4K 6800	18	15	351*	4.50
Storage Increment, 8K 6801	32	27	637*	6.50
Storage Increment, 12K 6802	45	38	910*	11.00
Storage Increment, 16K 6803	58	49	1,170	13.00
3501 Cd Rdr Attach 8050	13	11	440	.50
3782/2502 Cd Rdr Atch 8149	19	16	640	4.00
3782/3521 Cd Pch Atch 8150	19	16	640	3.50

*Customers who elect to purchase one of these features and anticipate later ordering additional storage, should consider purchase of the larger storage initially because a field upgrade requires replacement of the initial feature.

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

Forms Stand (#4450) - permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

Print Belt, Additional (#5812, #5813, #5822, #5823) - permits the customer to obtain more than one character set print belt for various applications.

- 64-character ASCII (#5812)**
- 94-character ASCII (#5813)**
- 64-character EBCDIC (#5822)
- 94-character EBCDIC (#5823)

** ASCII Feature (#1201) is prerequisite.

**IBM 3776 COMMUNICATION TERMINAL**
Models 1 and 2

Purpose: The 3776 is a medium speed remote job entry terminal and is a member of the 3770 Data Communication System. The 3776 mdl 1 and 2 are SNA Single Logical Unit and BSC terminals. A keyboard is used for terminal control and may be used for operator communication with the host CPU. The 3776 is not designed as an interactive terminal. The printer contains an engraved character font belt (48, 64 or 94 character set) which can be interchanged by the operator. Special features permit one or two diskette storage devices and provide for the attachment of one card reader and one card punch. One of three card readers can be selected for operation at speeds of 50, 150 or 300 cards a minute. The card punch operates at 50 cpm. A special feature provides for paper insertion from either the front or rear of the machine.

Communication features allow for operation over switched or non-switched facilities at speeds up to 4800 bps using SDLC or BSC transmission techniques and an appropriate modem.

	Maximum Lines Per Minute	Character Set
Model 1	300	48
	230	64
	160	94
Model 2	400	48
	300	64
	230	94

Highlights:

Keyboard -- EBCDIC arrangement with 44 data keys (produces 88 characters). Underscore/Hyphen, Backspace, Space and Character Advance keys have typamatic action. Associated with the keyboard are indicator lights, function keys, operating mode switches, and a 3-position numeric display.

Printer -- line printing is from characters engraved on a revolving belt. Included as standard is one interchangeable print belt (either 48, 64 or 94 character set) ... see "Specify" ... variable width forms tractor for feeding continuous forms up to 15 inches wide, paper jam detection, and 132 print positions. Character spacing is 10 per inch, line spacing is 6 or 8 per inch. Maximum print lines is 127 lines per page. Refer to GA24-3488 for forms design considerations.

Buffers -- transfer data between the input and output devices and the communication line. The buffers also transfer data between input and output devices during offline operation. The buffers alternate in providing input and output service to permit overlapped operation. Dual 256-byte or dual 512-byte buffers are used for BSC or SDLC operation and are under operator control.

Printer Format Controls -- facilitate the formatting of printed data. Vertical and horizontal control characters in data initiate vertical or horizontal tabbing.

Compression/Expansion -- provides a means for improving the efficiency of data transmission. For BSC, the compression option can be invoked at the terminal for a job that reads non-transparent data from cards and diskette. A two-byte sequence is substituted for each occurrence of three or more consecutive blank bytes (63 consecutive blanks is the upper limit). A second two-byte sequence is appended if more than 63 consecutive blank bytes are read. The terminal monitors received non-transparent data that is destined for the printer or attached card punch and automatically expands this two-byte sequence to the correct number of blanks. SDLC implementation provides a compression option that can be invoked at the terminal for a job that reads data from cards or diskette. An identifying sequence is substituted for each occurrence of two or more consecutive duplicate characters. The terminal automatically expands the compression sequences to the correct number of blanks or duplicate characters for compressed transparent or non-transparent data received.

Transmission Reversal -- permits keyboard initiation of interrupt of host data transmission for terminal data transmission and for resumption of the host transmission upon completion of the terminal transmission. The function is dependent upon associated host programming.

Record Compress -- using two special feature diskette storage devices permits offline compression of Basic Exchange diskette records onto a single 3776 diskette for subsequent batch transmission. The compressed records are written on the 3776 diskette in 3770 mode. Record Compress using one diskette storage device permits the compression of Basic Exchange diskette records into blocks of 256 bytes or 512 bytes for transmission.

Dual Data Path -- provides for concurrent operation of a line-to-

printer job and a card reader-to-diskette, or diskette-to-card punch, or diskette-to-diskette job. The line-to-printer job uses either the dual 256-byte or dual 512-byte alternating buffers to accept data from the line and transfer it to the printer. A single 256-byte or single 512-byte buffer is used for data buffering between card I/O and diskette or diskette and diskette. Throughput for both online and offline jobs is degraded when run concurrently using dual data path.

Automatic Card to Line Job -- when an online job is completed and the 3776 goes into Standby Status, a reader-to-line job is automatically started. The Start-Job procedure is not required provided the terminal has a 2502 Card Reader and it is in ready status.

Input/Output Form Definitions -- can be operator or terminal defined. Up to five operator defined forms can be read from diskette or card reader to facilitate rapid job set-up when the terminal is equipped with either of the special features, otherwise they can be entered from keyboard. Printer format controls can be a part of the job definition. An appropriately configured 3776 will permit input/output job designation as follows:

Offline Jobs

Input	Output
(1) Diskette	Printer, Diskette or Card Punch
(1) Card Reader	Printer, Diskette or Card Punch

Online Batch Jobs

(1) Diskette or Card Reader	Line
(1) Line	Printer, Diskette or Card Punch

Dual Data Path Jobs

(2) Line	Printer
(2) Card Reader	Diskette
(2) Diskette	Card Punch
(2) Diskette	Diskette

- (1) One input device and one output device per job.
- (2) Line to printer occurs concurrently with card reader to diskette or diskette to card punch or diskette to diskette.

Performance Considerations -- actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application processing, etc., must all be considered in determining actual throughput. See IBM 3770 Data Communication System, GA27-3097, for additional information.

Problem Determination Procedures: Significant function has been designed into this unit to help provide greater availability to the customer. This has been done through the use of problem identification routines and procedures that are easily understood and used by the operator. See IBM 3776 Operating Procedures Guide, GA27-3107.

Customer Responsibilities: It will be a customer's responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Communications: See "Special Features." Transmission speeds up to 4800 bps over switched or non-switched facilities are allowed by selecting the appropriate modem and communication facility. Refer to 3770 Data Communication System in "Systems" for a Communication Configurator. Refer to M 2700 pages for information on customer responsibilities, communication facilities, and other attachment information. Also refer to 3863, 3864, 3872 and 3874 in "Machines." The 2400 BPS Integrated Modem and IBM 3872 Modem when appropriately configured can be intermixed on the same communication facility. The 4800 BPS Integrated Modem and IBM 3874 Modem when appropriately configured can be intermixed on the same communication facility.

Supplies: For mdl 1 or 2, a black ribbon, Part No. 1136670, or equivalent, is required. Alternate Part No. 1299160, or equivalent, incorporates a twist in the ribbon which may improve ribbon life if the major portion of printing is in the first 60 print positions.

Limitations: The input/output capabilities outlined under "Highlights" are dependent on appropriate configurations of the terminal. Keyboard and printer are standard. For other configurations refer to "Special Features" below.

Prerequisites:

For SDLC Communications with S/370 or 4300 Processor -- a 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or these operating systems running under VM/370 (OS/VS2 is not supported by the 4300 Processors).



3776 Communication Terminal - Models 1 and 2 (cont'd)

For BSC Communications with S/360, S/370 or 4300 Processors -- a virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or under RSCS and VM/370, or any of these operating systems running under VM/370 (OS/VS2 is not supported by the 4300 Processors). The 3776 Communications Terminals use 2770/3780 BSC programming support when operating in BSC mode. Operation with S/360, S/370 or 4300 Processors using 2770/3780 BSC programming is also permitted. See SRL GA27-3097 for BSC compatibility considerations. The customer may have to modify existing 2770/3780 application programs for operation with 3776. BSC attachment can be via a 3704/3705 Communications Controller, or a 2701 Data Adapter Unit attached to a channel of any S/370 or 4300 Processor; or via an Integrated Communications Adapter on S/370 mdl 115, 125, 135, 135-3 or 138; or via a Communications Adapter feature on the 4331 Processor. BSC attachment can be made via a 3704/3705 attached to a channel of a S/360 mdl 30, 40, 50, 65, 67 (in 65 mode), 75 or 195; via a 2701 attached to a channel of a S/360 mdl 22, 25, 30, 40, 44, 50, 65, 67 (in 65 mode), 75 or 195; or via an Integrated Communications Attachment on S/360 mdl 25.

Bibliography: GC20-0001.

Specify: [1] Voltage (115 V AC, 1-phase, 2-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. **Note:** Available at time of manufacture only.

[3] Remote Power Off: #9501 ... this specify feature can be used to conserve energy used by the terminal by providing the capability for the host CPU application program to initiate power down at the terminal by sending a controlled data sequence over communication facilities. The terminal must also be equipped with the appropriate communication special features. This capability is in addition to the standard power down switch which can be manually operated.

[4] Print Belt Character Set: Specify one for shipment with the 3776 (available at time of manufacture only). See Print Belts in M 10000 pages for print belts available in addition to belt specified on order entry.

- #9489 -- 48 Character Set EBCDIC (HN Character Set)**
- #9490 -- 48 Character Set EBCDIC (Standard Character Set)**
- #9491 -- 64 Character Set EBCDIC
- #9492 -- 94 Character Set EBCDIC
- #9493 -- 48 Character Set ASCII*
- #9494 -- 64 Character Set ASCII*
- #9495 -- 94 Character Set ASCII*

* ASCII Feature (#1201) is required.

** These belts are identical except for the following special character differences:

- #9489 has) (=
- #9490 has % # @

Print belts are interchangeable by the operator. The internal code structure adapts to the belt installed as follows:

	Data Stream Character	Printed Character
#9489 (HN) Specified		
HN Belt Installed) (=) (=
HN Belt Installed	% # @) (=
Standard Belt Installed) (=	% # @
Standard Belt Installed	% # @	% # @
#9490 (Standard) Specified		
Standard Belt Installed	% # @	% # @
Standard Belt Installed) (=	---
HN Belt Installed	% # @) (=
HN Belt Installed) (=	---

[5] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual-Physical Planning, GA27-3006.

PRICES:	Mdl	MAC/MRC	ETP/MLC 2 Yr	Purchase	MMMC
	3776 1	\$588	\$500	\$20,000	\$180
	2	676	575	23,000	199

Plan Offering: Plan B Machine Group: D Per Call: 1
Warranty: B Purchase Option: 45%
Useful Life Category: 2 Termination Chg Mnths: 5
Termination Chg Percent: 25% Upper Limit Percent: 0%

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

- Model 1 to Model 2 ... \$ 3,000*
- Model 1 to Model 3 ... \$11,000*
- Model 1 to Model 4 ... \$14,000*
- Model 2 to Model 4 ... \$11,000*

* Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model change involves removal of parts which become the property of IBM."

SPECIAL FEATURES

All special features can be field installed, except #1201 for which field installation is not recommended.

For Communication Capability -- select one Communication Feature (#1460, 1461 or 1470); a Communication Driver (#1481); one Integrated Modem (#5600, 5602, 5610, 5700, 5702, 5710) or EIA Interface (#3701). #1462 is required in addition to #1460 or #1461 for multipoint operation using BSC.

COMMUNICATION FEATURE ... one can be selected.

SDLC/BSC, SWITCH CONTROL (#1460). Provides communication procedure using SDLC or BSC under operator switch control. SDLC allows point-to-point or multipoint operation. BSC operation is point-to-point without #1462, multipoint with #1462. **Maximum:** One. **Limitation:** Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461). Provides for point-to-point BSC operation over switched or non-switched facilities. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched and non-switched SDLC procedures. For record purposes, also identify the primary CPU/Program Environment code. Specify one of the following: #9977 for DOS/VS VTAM, #9988 for OS/VS1 VTAM, #9989 for OS/VS2 VTAM, or #9993 for all other combinations of operating systems and access methods. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1461.

BSC MULTIPOINT (#1462). Required for BSC multipoint operation over non-switched facilities. **Maximum:** One. **Prerequisite:** #1460 or #1461. **Limitation:** See SRL GA27-3097 for BSC compatibility considerations.

COMMUNICATION DRIVER WITHOUT BUSINESS MACHINE CLOCKING (#1481). Provides communication driver without clocking. **Maximum:** One. **Prerequisite:** Communication Feature (#1460, 1461 or 1470).

EIA INTERFACE OR INTEGRATED MODEM ... one can be selected.

EIA INTERFACE (#3701). Provides an EIA RS-322C compatible interface and a cable for attachment of an IBM or other modem. Speeds up to 4800 bps for switched or non-switched operation are permitted. This feature in combination with #1481 can be used to attach to Modem Fan-out (#3901) on an adjacent terminal, or on an IBM 3863, 3864, 3872 or 3874 Modem. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with any Integrated Modem feature.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, POINT-TO-POINT (#5600). This self-clocked modem provides for point-to-point operation over non-switched communication facilities. Operator controls provide for half-speed operation and for adjusting receive equalization. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, MULTIPOINT (#5602). This self-clocked modem provides for multipoint operation over non-switched communication facilities. Operator controls provide for half-speed operation and for adjusting transmit and receive equalization. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with #3701 or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, SWITCHED WITH AUTO ANSWER (#5610). This self-clocked modem provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. Operator controls provide for half-speed operation. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). The user must provide a Data Coupler type CBS or equivalent. **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

SUB-FEATURES FOR 2400 BPS INTEGRATED MODEMS

SWITCHED NETWORK BACK-UP (#7951). Provides the capability

**3776 Communication Terminal - Models 1 and 2 (cont'd)**

ity of attaching 2400 BPS Integrated Modem (#5600 or 5602) to the switched network facility as a back-up to the primary non-switched facility. Operation over the switched network is in manual originate/manual answer mode to establish the connection. It can communicate at 2400/1200 bps with an IBM 3872 Modem equipped for operation over the public switched network (#7941, 7951 or 7952) attached to a 3704, 3705 or ICA of a 3115 or 3125. **Note:** To use this feature, operator intervention at the terminal is required. Operator intervention, program modification, or both, may be required at the using system. This feature can be used with BTAM programs for DOS/VS, OS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required in existing BTAM programming to fully utilize the capabilities of this feature. **Maximum:** One. **Prerequisites:** 2400 BPS Integrated Modem (#5600 or 5602). The user must provide a Data Coupler type CDT or equivalent. **Limitation:** Cannot be installed with #3701.

MODEM FAN-OUT (#3901). Equips the 2400 BPS Integrated Modem, Non-Switched, Multipoint (#5602) with the capability to be shared by up to two other terminals in addition to the host. **Maximum:** One. **Prerequisite:** #5602. **Limitation:** This feature can be used at a tributary station in a centralized multipoint network. In this configuration, BSC multipoint programming discipline or SDLC non-switched programming discipline will provide the selection/control of the terminal without any additional user involvement.

4800 BPS INTEGRATED MODEM, NON-SWITCHED, POINT-TO-POINT (#5700). This self-clocked modem provides for point-to-point operation over 4-wire non-switched communication facilities. This modem features automatic equalization and manual half-speed select. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

4800 BPS INTEGRATED MODEM, NON-SWITCHED, MULTI-POINT (#5702). This self-clocked modem provides for multipoint operation over 4-wire non-switched communication facilities. This modem features automatic equalization and manual half-speed select. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

4800 BPS INTEGRATED MODEM, SWITCHED, WITH AUTO ANSWER (#5710). This self-clocked modem provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. This modem features automatic equalization and manual half-speed select. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). The user must provide a Data Coupler type CBS or equivalent. **Limitation:** Cannot be installed with #3701, or with another Integrated Modem.

SUB-FEATURES FOR 4800 BPS MODEMS

SWITCHED NETWORK BACK-UP (#7952). Provides the capability of attaching 4800 BPS Integrated Modem (#5700 or 5702) to the switched network facility as a back-up to the primary non-switched facility. Operation over the switched network is in manual originate/manual answer mode to establish the connection. It can communicate at 4800/2400 bps with an IBM 3874 Modem equipped for operation over the public switched network (#7941, 7951 or 7952) attached to a 3704, 3705 or ICA of a 3115 or 3125. **Note:** To use this feature, operator intervention at the terminal is required. Operator intervention, program modification, or both, may be required on the using system. Additional customer program routines will be required in existing programming to fully utilize the capabilities of this feature. **Maximum:** One. **Prerequisite:** 4800 BPS Integrated Modem (#5700 or 5702). The user must provide a Data Coupler type CDT or equivalent. **Limitation:** Cannot be installed with #3701.

MODEM FAN-OUT (#3902). Equips the 4800 BPS Integrated Modem, Non-Switched, Multipoint (#5702) with the capability to be shared by up to two other terminals in addition to the terminal containing the integrated modem. **Maximum:** One. **Prerequisite:** #5702. **Limitation:** This feature can be used at a tributary station in a centralized multipoint network. In this configuration, BSC multipoint programming discipline or SDLC non-switched programming discipline will provide the selection/control of the terminal without any additional user involvement.

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC Keyboard. This feature also provides for operation with diskette storage features (ASCII is written on the diskette) and with BSC features #1460, 1461 or 1462 or with SDLC features #1460 or 1470. Orders for #1201 must also specify one print belt, #9493 for 48 character ASCII, #9494 for 64 character ASCII, or #9495 for 94 character ASCII. **Maximum:** One. **Field Installation:** Not recommended.

AUDIBLE ALARM (#1390). Sounds an alarm that alerts the operator of conditions requiring manual intervention. The alarm can be

enabled and reset from the keyboard. **Maximum:** One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. **Maximum:** One. **Limitation:** The keys provided for this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for both desk-console cabinet doors. **Maximum:** One. **Prerequisite:** Diskette Storage, 2nd (#4902). **Limitation:** The keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

FRONT FEED (#3951). Enables the operator to insert paper forms in the front or rear of the machine. A forms entry chute is provided under the keyboard for front loading. The paper supply is placed on the floor either under the keyboard in the front of the machine for front loading, or underneath the forms enclosure for rear loading.

FORMS STAND ... integrated into the machine covers for the 3776 mdl 1 and 2.

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with the feature. Refer to M 10000 pages for information on additional or replacement keys. **Maximum:** One.

DISKETTE STORAGE, 1ST (#4901). One device with a customer removable diskette is placed in the left cabinet. Additional diskettes are available from IBM. Characteristics of the diskette storage device are: one movable read/write head; one read/write surface; 73 data tracks; 26 sectors per track and 128 bytes per sector. Up to 949 256-byte records; or 474 512-byte records can be stored on the diskette (one 256-byte data record is reserved for forms control information). Each 256-byte record is stored in two consecutive numbered sectors in interchange mode, or in two non-consecutive sectors in 3770 mode. Each 512-byte record is stored in four consecutive sectors in interchange mode, or four non-consecutive sectors in 3770 mode. Diskette data is code insensitive in SDLC mode, non-transparent only in BSC mode. **Maximum:** One.

DISKETTE STORAGE, 2ND (#4902). Provides a second diskette storage device with the same characteristics as the 1st. It is placed in the right desk cabinet which is also supplied by this feature. The second diskette allows additional capabilities for:

Copy -- data can be copied from diskette 1 to diskette 2 (single data set or all active data sets -- 3770 mode only).

Concatenate (pool) -- the ability to concatenate on a data set basis.

Continue -- allows a read or write operation to automatically continue to diskette 2, if it has been placed in ready condition.

Maximum: One. **Prerequisite:** Diskette Storage, 1st (#4901). **Orders for Field Installation:** Must specify color -- #9081 for red, #9082 for yellow, #9083 for blue, or #9085 for gray. Color must be the same as that specified for the base machine.

OPERATOR ID FEATURE (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read. With BSC, a read operation can be initiated during a keyboard to line job only. Data read from the magnetic stripe card cannot be printed. **Maximum:** One. **Limitations:** [1] The operator must position and slide the card through the reader-slot at a steady rate between 5 and 40 inches per second for a read operation ... [2] BSC programming for 2770 and 3780 does not support this feature.

3501 CARD READER ATTACHMENT (#8050). To attach a 3501 Card Reader. **Maximum:** One. **Limitation:** Cannot be installed with 3782/2502 Card Reader Attachment (#8149). If a 3521 is also attached (#8150), the Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only.

3782/2502 CARD READER ATTACHMENT (#8149). To attach a 3782 Card Attachment Unit mdl 2 and a 2502 Card Reader mdl A1 or A2. **Maximum:** One. **Limitation:** Cannot be installed with 3501 Card Reader Attachment (#8050). If a 3521 is also attached (#8150), the Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only.

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. **Maximum:** One. **Limitation:** If a 2502 or 3501 Card Reader is also attached (#8149 or 8050), the Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only.



3776 Communication Terminal - Models 1 and 2 (cont'd)

Special Feature Prices:	MAC/ MRC	ETP/ MLC		Purchase	MMMC
		2 Yr			
Communication Feature					
SDLC/BSC,Swch Cntrl #1460	\$25	\$21	\$840	\$5.50	
BSC, Pt-to-Pt 1461	15	13	520	3.00	
SDLC 1470	13	11	440	3.00	
BSC Multipoint 1462	13	11	440	1.00	
Communication Driver					
w/o Bus Mche Clocking 1481	13	11	440	2.00	
EIA Interface 3701	13	11	440	1.00	
2400 BPS Integrated Modem					
Non-Switched, Pt-t-Pt 5600	68	58	2,320	5.00	
Non-Switched, Multipt 5602	74	63	2,520	5.00	
Switched w Auto Answr 5610	74	63	2,520	6.00	
4800 BPS Integrated Modem					
Non-Switched, Pt-to-Pt 5700	141	120	3,600	45.50	
Non-Switched, Multipt 5702	141	120	3,600	45.50	
Switched w Auto Answer 5710	159	135	4,050	48.00	
Swch Ntwk Backup 7951	11	9	360	.50	
Swch Ntwk Backup 7952	24	20	600	3.00	
Modem Fan-out 3901	21	18	720	1.00	
Modem Fan-out 3902	29	25	750	1.00	
ASCII Feature 1201	18	15	600	.50	
Audible Alarm 1390	40 SUC	-	40	.50	
Door Keylock 3401	15 SUC	-	15	NC	
Door Keylock, Dual 3402	30 SUC	-	30	NC	
Keylock 4650	35 SUC	-	35	NC	
Diskette Storage, 1st 4901	69	59	2,360	16.50	
Diskette Storage, 2nd 4902	69	59	2,360	7.00	
Operator ID Reader 5450	13	11	440	1.50	
Front Feed 3951	12	10	400	NC	
3501 Card Reader Attach 8050	13	11	440	.50	
3782/2502 Cd Rdr Attach 8149	19	16	640	4.00	
3782/3521 Cd Pch Attach 8150	19	16	640	3.50	

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages, see M 10000 for additional information and field installation.

Print Belt, Add'l (#5811, #5812, #5813, #5820, #5821, #5822, #5823) - Permits the customer to obtain more than one character set print belt for various applications.

- 48-character ASCII (#5811)*
- 64-character ASCII (#5812)*
- 94-character ASCII (#5813)*
- 48-character EBCDIC [HN Character Set] (#5820)
- 48-character EBCDIC (Standard Character Set) (#5821)
- 64-character EBCDIC (#5822)
- 94-character EBCDIC (#5823)

* ASCII Feature (#1201) is prerequisite.



**IBM 3776 COMMUNICATION TERMINAL
Models 3 and 4**

Purpose: The 3776 is a medium speed remote job entry terminal and is a member of the 3770 Data Communication System. The 3776 model 3 and 4 are SNA Multiple Logical Unit (MLU) terminals. A keyboard and a console display are used for terminal control and for operator communication with the host CPU. Terminal operation may be controlled by the storage of operating procedures, terminal setups and local utility programs in terminal storage for use by the terminal operator. The 3776 is not designed as an interactive terminal. The printer contains an engraved character font belt (48, 64 or 94 character set) which can be interchanged by the operator. A special feature provides for paper insertion from either the front or rear of the machine. Special features permit one or two diskette storage devices, one magnetic tape unit, one card reader and one card punch. One of three card readers can be selected for operation at speeds of 150, 300 or 400 cards per minute. The card punch operates at 50 cpm.

	Maximum Lines per Minute	Character Set
Model 3	300	48
	230	64
	160	94
Model 4	400	48
	300	64
	230	94

Highlights:

Communications -- transmission speeds from 2400 bps to 9600 bps and at 19.2K bps are provided using the appropriate modems and communications facilities. Duplex -- simultaneous inbound/outbound -- data transmission is provided on non-switched full duplex communication facilities only when communicating with an appropriately equipped 3705 Communications Controller with the supporting ACF/NCP/V5 level. May also be locally attached in either a duplex or half duplex mode to a 3705 at 14.4K bps.

Keyboard -- EBCDIC arrangement with 44 data keys. The keyboard in conjunction with a standard console display, indicator lights, function keys, operating mode switches and a 3-position numeric display provides operator control. Host application commands, System Services Control Point (SSCP) commands and local functions are entered from the keyboard. Data entered on the keyboard is displayed. If a keying error is made, Character Backspace and Character Advance may be used for editing. Character Backspace and Advance are non-destructive. Character Advance is typamatic. Reset returns to the position from which the Character Backspace began.

Console Display -- contains 16 lines of 64 characters each for a total of 1024 characters. The 3776 mdl 3 and 4 reserve the bottom three lines of the display for operator keying, display of system information and prompting for information required for the execution of functions. The remaining 13 lines of the display are used to display messages between the terminal and the host application or the SSCP and to display information regarding terminal operations such as host input.

Lower case alphabets are converted to upper case before displaying. When the cursor is beneath a character, any new data keystroke will cause the new character to replace the old. Overstrikes are not permitted.

Each message is displayed as it is received except as described below. Each message is also written in terminal storage. At power-on time, the operator is prompted to specify date and time. As messages are received they are time-stamped prior to display and storage. Messages longer than a display line will wrap around to the next line with an indent to aid readability. The display fills from top to bottom. Subsequent new message lines replace the oldest message lines. The most recent message received is identified by the Greater Than sign > in the first position. The following line is blanked to assist the operator with message identification.

Function keys on the keyboard allow the operator to control the display function. The display can be held while incoming messages are sent to terminal storage and not displayed. If messages arrive during the 'hold' state, a message alert light notifies the operator. The operator may subsequently display the desired message group. A terminal utility program is available for listing or copying the message contents of terminal storage for external message retention and reference.

Printer -- line printing is from characters engraved on a revolving belt. Included as standard is one interchangeable print belt (either 48, 64 or 94 character set) ... see "Specify." Also standard are a variable width forms tractor for feeding continuous forms up to 15" wide ... paper jam detection ... and 132 print

positions. Character spacing is 10 per inch, line spacing is 6 or 8 lines per inch. Maximum print lines is 127 lines per page. Refer to GA24-3844 for forms design considerations.

Terminal Storage -- is standard for message spooling, terminal control, utility programs and user generated procedures.

Diskette Storage -- there are two diskette storage devices available as special features. While the devices are physically identical to those on the 3776 mdl 1 and 2, additional operational facilities such as data set concatenation enhance the use of the special feature diskette storage devices. Also, each special feature diskette storage device may be assigned individually to an independent host SNA session or used locally for input or output. Diskette operation is concurrent with other terminal functions.

Magnetic Tape -- may be used as either an input or as an output device. One 3411 Magnetic Tape Unit and Control mdl 1 attachment is available as a special feature. The 3411 mdl 1 provides 9-track tape with recording densities of 1600 bpi Phase Encoded or 800 bpi NRZI. 7-track tape operation is not provided. The 3411 mdl 1 may be assigned to an independent host SNA session or used locally for input and output. Labeled and unlabeled tapes are supported. Records are fixed or variable length and may be unblocked or blocked to a maximum block size of 4000 bytes. Maximum record size is 255 bytes. A block size of up to 2000 bytes automatically provides dual buffering. Magnetic tape operation is concurrent with other terminal functions. Refer to G232-0004 for detailed information on operation of the 3411 mdl 1. Feature #7003 is required on the 3411 mdl 1.

Buffers -- transfer data between the input and output devices and the communication line. SDLC communications uses a customer defined Request/Response Unit (RU) of up to 512 bytes. The actual transmission is dependent on session pacing values, data length, buffer availability and data availability. Buffers also transfer data between input and output devices during local operation.

Printer Format Controls -- facilitate the formatting of printed data. Vertical control characters in data initiate vertical tabbing. Carriage control definition provides for specification of a variable number of line numbers per carriage stop with a maximum of 60 lines per carriage control definition. Carriage control definition may be defined at the terminal or may be sent dynamically by the host application. Extended Forms Definition is standard and uses terminal storage.

Compression/Expansion -- implementation provides a compression option at the terminal for a job that reads data from cards, magnetic tape, or diskette to the line. An identifying sequence is substituted for each occurrence of two or more consecutive duplicate characters. Trailing blank truncation is standard. The terminal automatically expands the compression sequence to the correct number of blanks or duplicate characters for compressed transparent or non-transparent data received.

Decompaction -- provides the decompaction function associated with the receipt of a compacted data stream whereby a pair of consecutive alphanumeric characters is represented by a single transmission byte. Function depends upon transmission by the host of a decompaction table corresponding to the compaction table used by host programming in creating the compacted job data stream. Decompaction occurs for data directed to the printer, card punch, magnetic tape and diskette (except 3770 format). Compaction by the terminal of data inbound to the host is not provided.

Automatic Card Reading -- capability is under control of the operator. The "hot reader" function may be enabled/disabled at any appropriate operational time.

Job Control -- initiated by the operator, pertains to online jobs with the host and local utility jobs run concurrently with the online jobs. Online job submission may be initiated at any time there is an SNA session available for data transmission. The terminal may have up to six concurrent sessions that are controlled by the operator. Online job input may consist of card, diskette or magnetic tape data. Data from different devices or data sets may be concatenated into a single input data stream as one job execution. Online job output may consist of printer, card, diskette or magnetic tape data.

Local utility jobs may be defined by the operator and stored in terminal storage to provide the following functions:

Input	Output
Card	Printer, Magnetic Tape, Diskette, Card Punch
Magnetic Tape	Printer, Diskette, Card Punch
Diskette	Printer, Magnetic Tape, Diskette, Card Punch

Record Formats -- consist of card image, print image and 3770 format. Card image and print image, in addition to being applicable to card reader, card punch, printer and magnetic tape datasets, are also applicable to diskette as a function of Basic Exchange datasets (128 byte maximum).



3776 Communication Terminal - Models 3 and 4 (cont'd)

Basic Exchange diskettes may be read by the terminal. Basic Exchange diskettes may also be written by the terminal, thereby creating a diskette for further Basic Exchange mode processing.

3770 Format is applicable to diskette data recording which is to be subsequently printed or punched. 3770 format recording results in more efficient diskette utilization than does card or print image. Basic Exchange (card or print image) or 3770 Format is a user specification in job control.

Input record size from both magnetic tape and diskette may be limited to 80 or 128 bytes, because of host programming considerations. In addition, the ability to concatenate multiple data sets, with different record lengths, into a single input job stream requires host programming support of a CDS-FM Header type 1 (Continue Destination Select).

Remote Power Off -- see #9501 under "Specify" below.

Encrypt/Decrypt Feature -- see #3680 under "Special Features." Available to provide secure data transmission in conjunction with ACF VTAM Encrypt/Decrypt Feature (Program Number 5735-RC2) (Feature Number 6010) and Programmed Cryptographic Facility Program Product (Program Number 5740-XY5).

Performance Considerations -- the line-to-printer performance of the 3776 mdl 3 is up to 300 lpm with a 48-character set print belt. The line-to-printer performance of the 3776 mdl 4 is up to 400 lpm with a 48-character set print belt.

The 3776 mdl 3 and 4 MLU terminals will operate, however, with concurrent input-output processing in either a half-duplex or duplex communications mode as a function of the base Multiple Logical Unit capability. The card reader, punch, diskette storage devices, magnetic tape unit and display console may have a degrading effect on printer performance during concurrent operations. The degree of degradation which may occur will tend to be greater when half-duplex communications are employed as opposed to duplex communications and system facilities in support of the concurrent inbound-outbound data stream capability of the terminal.

Actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application processing, SNA pacing, cryptographic processing, etc., must all be considered in determining actual throughput.

In general, duplex data communications operation will tend to provide greater terminal throughput under concurrent input/output functions than a half-duplex communications mode. The 3776 mdl 3 or 4 operating duplex at 19.2K bps on a terrestrial link may, however, present a variance of from greater to degraded overall terminal throughput when compared to comparable operation in a half-duplex mode.

Problem Determination Procedures: Function has been designed into this unit to help provide availability to the customer. See *IBM 3770 Multiple Logical Unit Operator's Guide for 3776-3, 3776-4, 3777-3, GA27-3125.*

Customer Responsibilities: It will be a customer's responsibility to use and follow the Problem Determination Procedures and to fill out the trouble report prior to calling IBM for service. Also refer to the M 2700 pages.

Communications: See "Special Features." Transmission speeds from 2400 bps to 9600 bps and at 19.2 Kbps. Point-to-point and multipoint transmission capability over switched or non-switched facilities is allowed by selecting the appropriate modem and communication facility. Speeds above 4800 bps are on non-switched facilities. Direct local attachment to 3705-II at 14.4K. bps. EBCDIC is the standard transmission code. ASCII is available as a special feature. Refer to M 2700 pages for information on customer responsibilities, communication facilities and other attachment information.

For 19.2 Kbps, the 3776 mdl 3 or 4 may use either the EIA Interface or the High Speed Digital Interface special feature to communicate through an appropriate modem and communication facility with a 3704/3705 Communications Controller equipped with a Line Set Type 1G (#4717) at the central processing unit. This type of communication requires modems which are line compatible (suitable for inter-connection) and which provide optional EIA RS232C or High Speed Digital Interface DTE interfaces. Also attaches via the Communications Adapter feature on a 4331 Processor ... see 4331 for details.

IBM Modems: The following IBM modems can be used: 3863 (2400 bps), 3864 (4800 bps) or 3865 (9600 bps). **Note:** 4-wire Switched Network Backup is available on the 3863 mdl 1, 3864 mdl 1 or 3865 mdl 1 or 2. For communications capability, product utilization and features, see 3863, 3864, 3865 and M 2700 pages.

Supplies: For a 3776 mdl 3 or 4, a black ribbon, Part No.

1136670, or equivalent, is required. Alternate Part No. 1299160, or equivalent, incorporates a twist in the ribbon which may improve ribbon life if the major portion of printing is in the first 60 print positions

Limitations: The input/output capabilities outlined under "Highlights" are dependent upon appropriate configurations of the terminal. Keyboard, console display, terminal storage and printer are standard. One communications feature (#3701, 4501, 5650 or 5651) is required. For other configurations, refer to "Special Features" below. The duplex data communications capability of the 3776 mdl 3 or 4 is operational on non-switched full duplex communications facilities only.

Communications Adapter: An integrated communications adapter without business machine clocking is standard ... provides SDLC communications over switched or non-switched facilities.

Prerequisites for SDLC Communications with S/370 or 4300 Processors: A 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage S/370 or 4300 Processor operating under VS1, MVS or DOS/VS using RES, JES2, JES 3, POWER/VS or VTAM. Note: MVS and JES3 are not supported on 4300 Processors.

An appropriately featured 3705 operating under the appropriate level of Network Control Program (ACF/NCP/VS) is required for duplex data stream operation.

Bibliography: GC20-0001

SPECIFY

- Voltage** (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. See 3411 mdl 1 for magnetic tape unit voltage requirements.
- Remote Power Off: #9501** ... this specify feature can be used to conserve energy used by the terminal by providing the capability for the host CPU application program to initiate power down at the terminal by sending a controlled data sequence over communication facilities. The terminal must also be equipped with the appropriate communication special features. This capability is in addition to the standard power down switch which can be manually operated.
- Print Belt Character Set:** Specify one. Available at time of manufacture only ... specify for print belt to be shipped with machine. See Print Belts in M 10000 pages for print belts available in addition to belt specified on order entry. Print belts are interchangeable by the operator.
 - #9489 -- 48 Character Set EBCDIC (HN Character Set) *
 - #9490 -- 48 Character Set EBCDIC (Standard Character Set) *
 - #9491 -- 64 Character Set EBCDIC
 - #9492 -- 94 Character Set EBCDIC
 - #9493 -- 48 Character Set ASCII **
 - #9494 -- 64 Character Set ASCII **
 - #9495 -- 94 Character Set ASCII **

* These belts are identical except for the following special character differences:

- #9489 has) (=
- #9490 has % # @

** ASCII Feature (#1201) is required.

- Cables** ... fixed length cables except for the 3411 Magnetic Tape Unit and Control are provided as standard. See *Installation Manual - Physical Planning, GA27-3006.* 3411 cables must be ordered separately.
- EIA RS232C 19.2 Kbps Line Speed: #9481** ... provides support of 19.2 Kbps. Used for record purposes.
- Alternate Address: #9011** ... Order this optional feature to specify that diskettes containing terminal control code updates are to be mailed to an alternate address using a Teleprocessing Control number (TPC). The alternate address selected is usually the central site location.
- Color:** Blue is supplied as standard except for field model conversions where installed color groups will be matched (do not specify).

PRICES:	Mdl	MRC	MLC 2 Yr	Purchase	MMMC
3776	3	\$881	\$750	\$30,000	\$265
	4	969	825	33,000	281

Plan Offering: Plan B Machine Group: D Per Call: 1
 Warranty: B Purchase Option: 45%
 Useful Life Category: 2 Termination Charge Months: 5
 Termination Charge Percent: 25% Upper Limit Percent: 0%

Model Changes: Field installable.



3776 Communication Terminal - Models 3 and 4 (cont'd)

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

- Model 1 to Model 3 ... \$ 11,000*
- Model 1 to Model 4 ... \$ 14,000*
- Model 2 to Model 4 ... \$ 11,000*
- Model 3 to Model 4 ... \$ 3,000*

* Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this model change involves removal of parts which become the property of IBM."

SPECIAL FEATURES

All special features can be field installed, except #1201 for which field installation is not recommended.

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with diskette storage features (ASCII is written on the diskette). Orders for #1201 must also specify one print belt, #9493 for 48 character ASCII, #9494 for 64 character ASCII, or #9495 for 94 character ASCII. **Maximum:** One. **Field Installation:** Not recommended.

AUDIBLE ALARM (#1390). Sounds an alarm that alerts the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. **Maximum:** One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. **Maximum:** One. **Limitation:** The keys provided for this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for both desk-console cabinet doors. **Maximum:** One. **Prerequisite:** Diskette Storage, 2nd (#4902). **Limitation:** The keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

ENCRYPT/DECRYPT (#3680). Provides cryptographic data transmission in conjunction with program support in the host. Includes a security keylock. Each machine will have its own unique key. Two identical keys are supplied with the feature. **Maximum:** One. **Note:** A mercury battery, IBM Part No. 1743456 or equivalent, is required. A battery is shipped with this feature. See M 10000 pages for additional or replacement batteries. Replacement of the discharged battery is the customer's responsibility.

EIA INTERFACE (#3701). Provides an EIA RS 232C compatible interface and a cable for attachment to a modem. Speeds from 2400 bps to 9600 bps and at 19.2 Kbps are permitted. **Maximum:** One. **Limitation:** Cannot be installed with DDS Adapter, Point-to-Point (#5650), DDS Adapter, Multipoint (#5651), High Speed Digital Interface (#4501) or V35 Interface (#4720). **Prerequisite:** For 19.2 Kbps operation, #9841 is required ... see item [6] under "Specify."

FRONT FEED (#3951). Enables the operator to insert paper forms in the front or rear of the machine. A forms entry chute is provided under the keyboard for front loading. The paper supply is placed on the floor either under the keyboard in the front of the machine for front loading, or underneath the forms enclosure for rear loading.

FORMS STAND ... integrated into the machine covers for the 3776 mdl 3 and 4.

HIGH SPEED DIGITAL INTERFACE (#4501). Provides an interface and a cable for attachment to a modem which permits point-to-point and multipoint synchronous operation at 19.2 Kbps on a Type 5703 or 8803 wideband channel. **Maximum:** One. **Limitation:** Cannot be installed with EIA Interface (#3701), DDS Adapter, Point-to-point (#5650), DDS Adapter, Multipoint (#5651) or V35 Interface (#4720).

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to keyboard control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with the feature. Refer to M 10000 pages for information on additional or replacement keys. **Maximum:** One.

V35 INTERFACE (#4720). Required for direct High Speed Local Attachment to a 3705-II at 14.4Kbps with a maximum cable distance of 170 feet. **Limitation:** Cannot be installed with #3701, #4501, #5650 or #5651. **Field Installation:** Yes.

DISKETTE STORAGE, 1ST (#4901). One device with a customer removeable diskette is placed in the left cabinet. Additional diskettes are available from IBM. Characteristics of the diskette storage device are: one moveable read/write head, one read/write surface, 73 data tracks, 26 sectors per track and 128 bytes per sector. Up to 1898 128-byte records. Data may be stored in either a Basic Exchange dataset, or in a 3770 format dataset. Diskette capabilities allow for:

Concatenate (pool) -- the ability to concatenate on a data set basis.

Multivolume -- allows a read or write operation to automatically continue to diskette 2 if it has been placed in ready condition, or it may continue on the current drive.

Maximum: One.

DISKETTE STORAGE, 2ND (#4902). Provides a second diskette storage device with the same characteristics as the first. It is placed in the right desk cabinet which is also supplied by this feature. The second diskette allows additional capabilities for:

Copy -- data can be copied from diskette 1 to diskette 2.

Maximum: One. **Prerequisite:** Diskette Storage, 1st (#4901).

OPERATOR ID FEATURE (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read. Data read from the magnetic stripe card cannot be printed or displayed. **Maximum:** One. **Limitations:** The operator must position and slide the card through the reader-slot at a steady rate between 5 and 40 inches per second for a read operation.

DDS ADAPTER (DDSA) (#5650 - For Point-to-Point Operation ... #5651 - For Multipoint Operation). Provides an adapter for SDLC data transmission at speeds of 2400, 4800 or 9600 bps over the AT&T non-switched Dataphone* Digital Service network. The DDSA interfaces to a DDS channel service unit, the customer site termination of the DDS network. **Specify:** #9822 for 2400 bps, #9823 for 4800 bps, or #9825 for 9600 bps. **Maximum:** One, #5650 or #5651. **Limitation:** Cannot be installed with EIA Interface (#3701), High Speed Digital Interface (#4501) or V35 Interface (#4720).

3411 MAGNETIC TAPE UNIT AND CONTROL MDL 1 ATTACHMENT (#7801). To attach one 3411 Magnetic Tape Unit and Control mdl 1. **Maximum:** One. **Prerequisite:** Feature #7003 on the 3411 mdl 1.

3782/2502 CARD READER ATTACHMENT (#8149). To attach a 3782 Card Attachment Unit mdl 2 and a 2502 Card Reader mdl A1, A2 or A3. **Maximum:** One. **Limitation:** Optical Mark Read on the 2502 is not supported.

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. **Maximum:** One. **Limitation:** The Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only.

Special Feature Prices:	MLC				
	MRC	2 Yr	Purchase	MMMC	
ASCII Feature	#1201	\$18	\$15	\$600	\$50
Audible Alarm	1390	40 SUC	-	40	.50
Door Keylock	3401	15 SUC	-	15	NC
Door Keylock, Dual	3402	30 SUC	-	30	NC
Encrypt/Decrypt	3680	47	40	1,600	2.00
EIA Interface	3701	13	11	440	1.00
Front Feed	3951	12	10	400	NC
Hi Spd Digital Intfce	4501	41	35	1,400	1.00
Keylock	4650	35 SUC	-	35	NC
V35 Interface	4720	15	13	510	2.00
Diskette Storage, 1st	4901	69	59	2,360	16.50
Diskette Storage, 2nd	4902	69	59	2,360	7.00
Operator ID Reader	5450	13	11	440	1.50
DDS Adapter, Pt-to-Pt	5650	24	20	840	2.00
DDS Adapter, Multipt	5651	24	20	840	2.00
3411 Mdl 1 Attachment	7801	118	100	4,000	14.00
3782/2502 Cd Rdr Attach	8149	19	16	640	4.00
3782/3521 Cd Pch Attach	8150	19	16	640	3.50

* Registered Trademark of AT&T.

**3776 Communication Terminal - Models 3 and 4 (cont'd)**

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the Feature No. or Part No. indicated below at the price listed in M 10000 pages ... see M 10000 pages for additional information and field installation.

Print Belt, Add'l (#5811, #5812, #5813, #5820, #5821, #5822, #5823) -- permits the customer to obtain more than one character set print belt for various applications.

48-character ASCII (#5811)**

64-character ASCII (#5812)**

94-character ASCII (#5813)**

48-character EBCDIC [HN Character Set] (#5820)

48-character EBCDIC (Standard Character Set) (#5821)

64-character EBCDIC (#5822)

94-character EBCDIC (#5823)

** ASCII Feature (#1201) is prerequisite.

Mercury Battery (Part No. 1743456). Provides power to sustain the master key of the Encrypt/Decrypt feature (#3680) when normal power is not present. This accessory is a 4 volt non-rechargeable mercury battery. This battery has a shelf life of 1 year under normal conditions, and can be expected to provide 3.5 years of normal operation. **Note:** Discharged battery should be returned to IBM.

3777 COMMUNICATION TERMINAL

Model 1

Purpose: The 3777 mdl 1 is a high speed remote job entry terminal and is a member of the 3770 Data Communication System. A keyboard is used for terminal control and may be used for operator communication with the host CPU. A printer is used for output. The 3777 mdl 1 is not designed as an interactive terminal. The printer is not integrated into the 3777 mdl 1 but is a stand-alone 3203 Printer mdl 3 which is cable attached to the 3777 mdl 1. The 3203 mdl 3 uses the 1416 Interchangeable Train Cartridge which can be interchanged by the operator. Special features permit one or two diskette storage devices and provide for attachment of one card reader. One of three card readers can be selected for operation at 150, 300 or 400 cards per minute. A minimum configuration includes a 3777 Communication Terminal mdl 1 and a 3203 Printer mdl 3.

Communication features permit operation at speeds from 2400 bps to 9600 bps and at 19.2K bps using BSC or SDLC transmission techniques and an appropriate modem. Direct local attachment to a 3705-II at 14.4K bps via appropriate features.

Maximum Lines Per Minute

Std 3203 mdl 3	Featured 3203 mdl 3	Character Set
1000	1200	48AN, HN
870	1020	60 PN

See "Type Catalog" for additional character sets and speeds ... see 3203 for 1200 LPM Speed Enhancement feature information.

Highlights:

Keyboard -- EBCDIC arrangement with 44 data keys (produces 88 characters). Underscore/Hyphen, Backspace, Space and Character Advance keys have typamatic action. Associated with the keyboard are indicator lights, function keys, operating mode switches, and a 3-position numeric display.

Printer -- a stand-alone 3203 Printer mdl 3 cable attached to the 3777. 3203 mdl 3 uses the 1416 Interchangeable Train Cartridge. The 3771 mdl 1 supports fifteen Print Train Arrangements (AN, HN, OAA, ODA, ONA, OAB, GN, PCS-AN, PCS-HN, PN, QNC, QN, RN, SN, TN) as standard. When a substitute character is ordered to displace a character in one of the standard arrangements, the substituted character assumes the card and bit codes of the character it replaces. See "Type Catalog." If the International Print Support specify feature (#9351) is installed, the 3777 mdl 1 will support Print Train Arrangements corresponding to the 48, 64 and 94-character EBCDIC sets available for print belts for the 3776 Communication Terminal. Support is also provided for the QN, HN, AN, PN, RN and PCS-HN arrangements. The 3203 mdl 3 permits feeding continuous forms up to 20 inches wide and 132 print positions. Character spacing is 10 per inch, line spacing is 6 or 8 per inch under operator control. Maximum print lines is 127 per page when attached to the 3777 mdl 1. Refer to the M 3203 writeup for further description of the 3203 mdl 3. Refer to "Type Catalog" for further description of the 1416 print train arrangements supported and for print speeds. Refer to GA24-3488 for forms design considerations.

Buffers -- transfer data between the input and output devices and the communication line. The buffers also transfer data between input and output devices during offline operation. The buffers alternate in providing input and output services to permit overlapped operation. Dual 256-byte or dual 512-byte buffers are used for BSC or SDLC operation and are under operator control.

Printer Format Controls -- facilitate the formatting of printed data. Vertical and horizontal control characters in data initiate vertical or horizontal tabbing.

Compression/Expansion -- provides a means for improving the efficiency of data transmission. For BSC, the compression option can be invoked at the terminal for a job that reads non-transparent data from card and diskette. A two-byte sequence is substituted for each occurrence of three or more consecutive blank bytes (63 consecutive blanks is the upper limit). A second two-byte sequence is appended if more than 63 consecutive blanks are read. The terminal monitors received non-transparent data that is destined for the printer and automatically expands the two-byte sequence to the correct number of blanks. SNA/SDLC implementation provides a compression option that can be invoked at the terminal for a job that reads data from cards or diskette. An identifying sequence is substituted for each occurrence of two or more consecutive duplicate characters. The terminal automatically expands the compression sequence to the correct number of blanks or duplicate characters for compressed transparent or non-transparent data received.

Decompression -- provides the decompression function associated

with the receipt of a compacted data stream whereby a pair of consecutive alphameric characters is represented by a single transmission byte. Function is dependent upon transmission receipt, and subsequent 3777 mdl 1 storage, of a decompression table corresponding to the compaction table used by host programming in creating the compacted data stream. Decompression function is available only under SDLC operation. Decompression occurs only for data directed to the printer. Compaction by the 3777 mdl 1 of data inbound to the host is not provided.

Transmission Reversal -- permits keyboard initiation of interrupt of host data transmission for terminal data transmission and for resumption of the host transmission upon completion of the terminal transmission. The function is dependent upon associated host programming.

Record Compress -- using two special feature diskette storage devices permits offline compress of Basic Exchange diskette records onto a single 3777 mdl 1 diskette for subsequent batch transmission. The compressed records are written on the 3777 mdl 1 diskette in 3770 mode. Record Compress using one diskette storage device permits the compression of basic exchange diskette records into blocks of up to 256 bytes or 512 bytes for transmission.

Dual Data Path -- provides for concurrent operation of a line-to-printer primary job and a card reader-to-diskette or diskette-to-diskette secondary job. The line-to-printer job uses either the 256-byte or dual 512-byte alternating buffers to accept data from the line for printing. A single 256-byte or single 512-byte buffer is used for data buffering between card and diskette or diskette and diskette. The primary line-to-printer job will not normally degrade during dual data path operation. The secondary job will degrade during periods of concurrent operation.

Automatic Card-to-Line Job -- when an online job is completed and the 3777 goes into Standby Status, a reader-to-line job is automatically started. The Start-Job procedure is not required provided the terminal has a 2502 Card Reader and it is in Ready Status.

Remote Power Off -- this feature can be used to conserve energy used by the terminal by providing the capability for the host CPU application program to initiate power down at the terminal by sending a controlled data sequence over communication facilities. The terminal must also be equipped with the appropriate communication special features. This capability is in addition to the standard power down switch which can be manually operated.

Input/Output Form Definitions -- can be operator or terminal defined. Up to five operator defined forms can be read from diskette or card reader to facilitate rapid job set-up when the terminal is equipped with either of the special features, otherwise they can be entered from keyboard. Printer format controls can be part of the job definition. An appropriately configured 3777 mdl 1 will permit input/output job designation as follows:

Offline Jobs

Input	Output
(1) Diskette	Printer or Diskette
(1) Card Reader	Printer or Diskette

Online Batch Jobs

(1) Diskette or Card Reader	Line
(1) Line	Printer or Diskette

Dual Data Path Jobs

(2) Line	Printer
(2) Card Reader	Diskette
(2) Diskette	Diskette

- (1) One input device and one output device per job.
- (2) Line to printer occurs concurrently with card reader to diskette or diskette to diskette.

Performance Considerations -- actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application processing, etc., must all be considered in determining actual throughput. See IBM 3770 Data Communication System, GA27-309, for additional information.

Problem Determination Procedures: Significant function has been designed into this unit to help provide greater availability to the customer. This has been done through the use of problem identification routines and procedures that are easily understood and used by the operator. See IBM 3777-1 Operating Procedures Guide, GA27-3124.

Customer Responsibilities: It will be a customer's responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Communications: See "Special Features." Transmission speeds

3777 Communication Terminal Model 1 (cont'd)

of up to 9600 bps and at 19.2K bps are allowed by selecting the appropriate modem and communication facility. Direct local attachment to a 3705-II at 14.4K bps. Speeds above 4800 bps are on non-switched facilities. Refer to 3770 Data Communication System in "Systems" for a Communication Configurator. Refer to M 2700 pages for information on customer responsibilities, communication facilities, and other attachment information.

For 19.2 Kbps, the 3777 mdl 1 may use either the EIA or the High Speed Digital Interface to communicate through an appropriate modem and communication facility with a 3704/3705 Communications Controller equipped with a Line Set 1G (#4717) at the central processing unit. This type of communication requires modems which are line compatible (suitable for interconnection) and which provide optional EIA or RS 232C or High Speed Digital Interface DTE interfaces. Also attaches via a Communications Adapter feature on the 4331 Processor ... see M 4331 pages for details.

IBM Modems: The following IBM Modems can be used: 3863 (2400 bps), 3864 (4800 bps) or 3865 (9600 bps). Note: 4-wire Switched Network Backup is available on the 3863 mdl 1, 3864 mdl 1 and 3865 mdls 1 and 2. For communications capability, product utilization, and features, see 3863, 3864, 3865 and M 2700 pages.

Supplies: 3203 mdl 3 ribbons

Prerequisites:

For SDLC Communications with S/370 or 4300 Processor -- a 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or these operating systems running under VM/370. Note: OS/VS2 is not supported by the 4300 Processors.

For BSC Communications with S/360, S/370 or 4300 Processor -- a virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or under RSCS and VM/370, or any of these operating systems running under VM/370. Note: OS/VS2 is not supported by the 4300 Processors. The 3777 mdl 1 Communication Terminals use 2770/3780 BSC programming support when operating in BSC mode. Operation with S/360, S/370 or 4300 Processors using 2770/3780 BSC programming is also permitted. See SRL GA27-3097 for BSC compatibility considerations. The customer may have to modify existing 2770/3780 application programs for operation with 3777 mdl 1. BSC attachment can be made via a 3704/3705 Communications Controller, or a 2701 Data Adapter Unit attached to a channel of any S/370 Processor; or via an Integrated Communications Adapter on S/370 mdl 115, 125, 135, 135-3 or 138; or via a Communications Adapter feature on the 4331 Processor. BSC attachment can be made via a 3704/3705 attached to a channel of a S/360 mdl 30, 40, 50, 65, 67 (in 65 mode), 75 or 195; via a 2701 attached to a channel of a S/360 mdl 22, 25, 30, 40, 44, 50, 65, 67 (in 65 mode), 75 or 195; or via an Integrated Communications Attachment on S/360 mdl 25.

Bibliography: GC20-0001.

Specify: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. See 3203 mdl 3 for 3-phase power requirements

[2] Color: Blue is supplied as standard.

[3] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual - Physical Planning, GA27-3006 and to Customer Site Preparation Planning Guide, GA27-3103.

[4] International Print Support: #9351 ... provides support for modified AN, PN and SN print train arrangements for the 1416 Interchangeable Train Cartridge corresponding to the 48, 64 and 94-character EBCDIC sets available for print belts for the 3776 Communication Terminal. Support is also provided for the QN, HN, AN, PN, RN and PCS-HN arrangements. See "Type Catalog." Note: Not recommended for field installation ... replaces the standard print support.

[5] EIA RS232C 19.2 Kbps Line Speed: #9481 ... provides support of 19.2 Kbps. Provides diagnostics and used for record purposes.

PRICES	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
	1	\$370	\$315	\$12,600	\$68

Plan Offering: Plan B Machine Group: D Per Call: 1
Purchase Option: 50% Useful Life Category: 2 Warranty: B
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Upper Limit Percent: 0%

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

- Model 1 to Model 2 ... \$ 4,600*
- Model 1 to Model 3 ... \$11,240*
- Model 2 to Model 3 ... \$ 6,440* †

*Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this model change involves removal of parts which become the property of IBM."

†Model Upgrade Price assumes Special Features #1601 and #1602 are installed on the Model 2. If they are not, an RPQ must be submitted.

SPECIAL FEATURES

[All special features can be field installed, except #1201 for which field installation is not recommended.]

For Communication Capability -- select one Communication Feature (#1460, 1461 or 1470); a Communication Driver (#1481), and EIA Interface (#3701), or High Speed Digital Interface (#4501). #1462 is required in addition to #1460 or #1461 for multipoint operation using BSC.

COMMUNICATION FEATURE ... select one.

SDLC/BSC, SWITCH CONTROL (#1460). Provides communication procedure using SDLC or BSC under operator switch control. SDLC allows point-to-point or multipoint operation. BSC operation is point-to-point without #1462, multipoint with #1462. **Maximum:** One. **Limitation:** Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461). Provides for point-to-point BSC operation over switched or non-switched facilities. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched and non-switched SDLC procedures. For record purposes, also identify the primary CPU/Program Environment code. Specify one of the following: #9977 for DOS/VS VTAM, #9988 for OS/VS1 VTAM, #9989 for OS/VS2 VTAM, or #9993 for all other combinations of operating systems and access methods. **Maximum:** One. **Limitation:** Cannot be installed with #1460 or #1461.

BSC MULTIPOINT (\$1462). Required for BSC multipoint operation over non-switched facilities. **Maximum:** One. **Prerequisite:** #1460 or #1461. **Limitation:** See SRL GA27-3097 for BSC compatibility considerations.

COMMUNICATION DRIVER WITHOUT BUSINESS MACHINE CLOCKING (#1481). Provides communication driver without clocking. **Maximum:** One. **Prerequisite:** Communication Feature (#1460, 1461 or 1470).

EIA INTERFACE (#3701). Provides an EIA RS-232C compatible interface and a cable for attachment to a modem. Speeds from 2400 bps to 9600 bps and at 19.2K bps are permitted. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). For 19.2 Kbps operation, #9481 is required ... see item [5] under "Specify." **Limitation:** Cannot be installed with High Speed Digital Interface (#4501) or V35 Interface (#4720).

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with diskette storage features (ASCII is written on the diskette) and with BSC features #1460, 1461 or 1462 or with SDLC features #1460 or #1470. A 1416 Interchangeable Train Cartridge containing an ASCII GN print train is required for the 3203 Printer mdl 3 if #1201 is ordered for the 3777. **Maximum:** One. **Field Installation:** Not recommended.

AUDIBLE ALARM (#1390). Sounds an alarm that alerts the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. **Maximum:** One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. **Maximum:** One. **Limitation:** The keys provided for this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for both desk-console cabinet doors. **Maximum:** One. **Prerequisite:** Diskette Storage, 2nd (#4902). **Limitation:** The keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

HIGH SPEED DIGITAL INTERFACE (#4501). Provides an interface and a cable for attachment to a modem which permits point-to-point synchronous operation at 19.2K bps on a Type 5703 or 8803 wideband channel. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with EIA



3777 Communication Terminal Model 1 (cont'd)
Interface (#3701) or V35 Interface (#4720).

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with the feature. Refer to M 10000 pages for information on additional or replacement keys. **Maximum:** One.

V35 INTERFACE (#4720). Required for direct High Speed Local attachment to a 3705-II at 14.4K bps with a maximum cable distance of 170 feet. **Limitation:** Cannot be installed with #3701 or #4501. **Field Installation:** Yes. **Prerequisite:** Communication Driver (#1481).

DISKETTE STORAGE, 1ST (#4901). One device with a customer removable diskette is placed in the left cabinet. Additional diskettes are available from IBM. Characteristics of the diskette storage device are: one movable read/write head; one read/write surface; 73 data tracks; 26 sectors per track and 128 bytes per sector. Up to 949 256-byte records, or 474 512-byte records can be stored on the diskette (one 256-byte record is reserved for forms control information). Each 256-byte record is stored in two consecutive numbered sectors in exchange mode, or in two non-consecutive sectors in 3770 mode. Each 512-byte record is stored in four consecutive sectors in exchange mode, or four non-consecutive sectors in 3770 mode. Diskette data is code insensitive in SDLC mode, non-transparent only in BSC mode. **Maximum:** One.

DISKETTE STORAGE, 2ND (#4902). Provides a second diskette storage device with the same characteristics as the first. It is placed in the right desk cabinet which is also supplied by this feature. The second diskette allows additional capabilities for:

- Copy** -- data can be copied from diskette 1 to diskette 2 (single data set or all active data sets. -- 3770 mode only).
- Concatenate (pool)** -- the ability to concatenate on a data set basis.
- Continue** -- allows a read or write program to automatically continue to diskette 2 if it has been placed in ready condition.

Maximum: One. **Prerequisite:** Diskette Storage, 1st (#4901).

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read.

With BSC, a read operation can be initiated during a keyboard to line job only. Data read from the magnetic stripe card cannot be printed. **Maximum:** One. **Limitations:** [1] The operator must position and slide the card through the reader-slot at a steady rate between 5 and 40 inches per second for a read operation ... [2] BSC programming for 2770 and 3780 does not support this feature.

PRINT SPEED ENHANCEMENT (#5595). Provides support for a 3203 Printer mdl 3 operating with 1200 LPM Speed Enhancement feature (#6360). **Maximum:** One.

2502 CARD READER ATTACHMENT (#8002). Provides for attachment of a 2502 Card Reader mdl A1, A2 or A3. **Maximum:** One

Special Feature Prices:	ETP/ MAC/ MLC		Purchase	MMMC	
	MRC	2 Yr			
Communication Feature					
SDLC/BSC,Swrch Cntrl	#1460	\$32	\$27	\$1,080	\$6.00
BSC, Pt-to-Pt	1461	19	16	640	3.00
SDLC	1470	16	14	560	3.00
BSC Multipoint	1462	13	11	440	1.00
Communication Driver					
w/o Bus Machine Clkg	1481	13	11	440	2.00
EIA Interface	3701	13	11	440	1.00
ASCII Feature	1201	18	15	600	.50
Audible Alarm	1390	40	SUC -	40	.50
Door Keylock	3401	15	SUC -	15	NC
Door Keylock, Dual	3402	30	SUC -	30	NC
High Spd Digital Inface	4501	41	35	1,400	1.00
Keylock	4650	35	SUC -	35	NC
V35 Interface	4720	15	13	510	2.00
Diskette Storage, 1st	4901	69	59	2,360	15.00
Diskette Storage, 2nd	4902	69	59	2,360	6.50
Operator ID Reader	5450	13	11	440	1.50
Print Speed Enhancement	5595	18	15	600	NC
2502 Cd Rdr Attachment	8002	29	25	1,000	4.50

**3777 COMMUNICATION TERMINAL
Model 2**

Purpose: The 3777 mdl 2 is a high speed remote job entry terminal which operates as a S/360 Model 20 - Submodel 5 BSC MULTI-LEAVING Workstation. A keyboard is used for terminal control and may be used for operator communication with the host CPU. A 3203 Printer mdl 3 may be used for output. The 3203 mdl 3 uses the 1416 Interchangeable Train Cartridge which can be interchanged by the operator. Special features provide for the attachment of one 1024-character console display, one diskette storage device for logging of console display messages, one diskette storage device for reading of card image Basic Exchange data sets (processed as 80 column card images), one card reader and one card punch. One of three 2502 Card Reader models can be selected for operation at 150, 300 or 400 cards per minute. The 3521 Card Punch operates at 50 cpm. A minimum configuration includes a 3777 Communication Terminal mdl 2, a 3203 Printer mdl 3 and a 2502 Card Reader or a Diskette Input Device (#3201). If a Diskette Input Device is attached and a 2502 Card Reader is not present, a Console Display (#1601) is required. A console display is also required if the keyboard is to be used for operator console communication with the host CPU.

Communication features permit operation at speeds from 2400 bps to 9600 bps and at 19.2 K bps using BSC transmission techniques and an appropriate modem. Direct local attachment to a 3705-II at 14.4K bps via appropriate features.

Maximum Lines Per Minute

Std 3203 mdl 3	Featured 3203 mdl 3	Character Set
1000	1200	48 AN, HN
870	1020	60 PN

See "Type Catalog" for additional character sets and speeds ... see 3203 for 1200 LPM Speed Enhancement feature (#6360) information.

Keyboard -- EBCDIC arrangement with 44 data keys (produces 88 characters). Space and Character Advance keys have typamatic action. Associated with the keyboard are indicator lights, function keys, operation mode switches, and a 3-position numeric display. The keyboard, in conjunction with the optional console display, provides a console function for the 3777 mdl 2.

Printer -- a stand-alone 3203 Printer mdl 3 cable attached to the 3777 mdl 2. The 3203 mdl 3 uses the 1416 Interchangeable Train Cartridge. The 3777 mdl 2 supports fifteen Print Train Arrangements (AN, HN, OAA, ODA, ONA, OAB, GN, PCS-AN, PCS-HN, PN, QNC, QN, RN, SN, TN) as standard. When a substitute character is ordered to displace a character in one of the standard arrangements, the substitute character assumes the card and bit codes of the character it replaces. See "Type Catalog." If the International Print Support specify feature is installed, the 3777 mdl 2 will support Print Train Arrangements corresponding to the 48, 64 and 94-character EBCDIC sets available for print belts on the 3776 Communication Terminal. Support is also provided for the QN, HN, AN, PN, RN and PCS-HN arrangements. The 3203 mdl 3 permits feeding continuous forms up to 20 inches wide and 132 print positions. Character spacing is 10 per inch, line spacing is 6 or 8 per inch under operator control. Maximum form length is 24 inches when attached to the 3777 mdl 2. Refer to the 3203 writeup for further description of the 3203 mdl 3. Refer to "Type Catalog" for further description of the 1416 print train arrangements supported and for print speeds. Refer to GA24-3488 for further design considerations.

Console Display -- contains up to 1,024 characters of information formatted into 16 lines of 64 character positions each. Operator messages are displayed in the top 14 lines of the display. Operator originated keyboard data is displayed in the bottom 2 lines of the display and will be displayed as keyed.

Operator messages larger than 64 characters overflow to subsequent lines. Subsequent lines of the message are indented. The latest message displayed is identified with a special character. If the display becomes full, the oldest message is overlaid, retaining the most recent messages on the display. The operator may defer subsequent messages in order to complete reference to a particular message.

Console Display Spooling -- a diskette storage device may be attached to the 3777 mdl 2 by special feature to provide storage for operator console messages. Two options are available to the operator when the diskette becomes filled. First, automatic rewrite occurs. New messages are overlaid upon older messages commencing with the initial message written upon the diskette. Second, an end of diskette signal is provided to the operator and messages are suspended pending replacement of the used diskette by a new diskette.

**3777 Communication Terminal - Model 2 (cont'd)**

Operator access to the diskette is via the keyboard. The diskette may be paged backward a defined number of messages and displayed for reference. In addition, the diskette may be written to the printer.

Diskette Input Device -- a diskette storage device may be attached to the 3777 mdl 2 by special feature for reading of card image Basic Exchange datasets. Basic Exchange datasets will be processed by the 3777 mdl 2 as 80 column card images. The datasets may be multivolume. Individual data sets or all active datasets may be printed. Initial Program Load of the workstation program may take place from the Diskette Input Device if the Console Spool Device is not present. Diskette IPL must take place from the Console Spool Device if both diskette devices are present. IPL is available from the 2502 Card Reader if that device is attached.

If the 3777 mdl 2 configuration includes both a 2502 Card Reader and the Diskette Input Device, diskette output may be alternated with cards; however both devices will not operate simultaneously. If the 3777 mdl 2 configuration includes a Diskette Input Device instead of a 2502 Card Reader, and IPL is executed from the Diskette Input Device or the Console Spool Device, the IPL diskette containing the workstation program must have been written on a 3777 mdl 2 configuration containing a 2502 Card Reader and a diskette device.

Buffers -- transfer data between the input and output devices and the communication line. The buffers alternate in providing input and output services to permit overlapped operation. Storage is provided in the 3777 model 2 for dual buffers for each input and output device attached. The buffer size is variable, depending upon the workstation program. The recommended buffer size is 512 bytes.

Communications Adapter -- integrated to provide BSC point-to-point operation over switched or non-switched facilities.

Printer Format Controls -- facilitate the formatting of printed data. Vertical forms definition provides forms set-up for the printer by means of the keyboard or card reader. The definition may be displayed on the console display, if present, or printed for verification.

Extended forms definition may be used in conjunction with the Diskette Input Device (#3201). Standard forms definition provides for the definition of five printer forms. Extended forms definition provides for greater than five printer forms. The Diskette Input Device (#3201) is a prerequisite to the use of extended forms definition.

Compression/Expansion -- provides a means for improving the efficiency of data transmission. Provides options of (dependent upon the workstation program) trailing blank truncation, blank or data compression/expansion.

Performance Considerations -- the line-to-printer performance of the 3777 mdl 2 and attached 3203 Printer mdl 3 is up to 1,000 lpm (up to 1200 lpm with 3203 mdl 3 Speed Enhancement feature) with 48 character AN or HN set, and up to 870 lpm (up to 1020 lpm with 3203 mdl 3 Speed Enhancement feature) with a 60 character PN set. The 3777 mdl 2 may operate, however, with concurrent input/output processing as a function of the MULTI-LEAVING capability. The card reader, punch and display console may have a degrading effect on printer performance while transferring data to and from the 3777 mdl 2 buffers and the host as communications line time is shared by all 3777 mdl 2 I/O units.

Actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application processing, etc., must all be considered in determining actual throughput. See 2770 Data Communication System, GA27-3097, for additional information.

Problem Determination Procedures -- significant function has been designed into this unit to help provide greater availability to the customer. This has been done through the use of problem identification routines and procedures that are easily understood and used by the operator. See IBM 3777-2 Operating Procedures Guide, GA27-3129.

Customer Responsibilities -- it will be a customer's responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Communications -- see "Special Features." Transmission speeds from 2400 bps to 9600 bps and at 19.2K bps. Point-to-point transmission capability over switched or non-switched facilities is allowed by selecting the appropriate modem and communication facility. Speeds above 4800 bps are on non-switched facilities. Direct local attachment to a 3705-II at 14.4K bps. EBCDIC is the only supported transmission code. Refer to M 2700 pages for

information on customer responsibilities, communication facilities, and other attachment information.

For 19.2 Kbps, the 3777 mdl 2 may use either the EIA or the High Speed Digital Interface to communicate through an appropriate modem and communication facility with a 3704/3705 Communications Controller equipped with Line Set Type 1G (#4717) at the central processing unit. This type of communication requires modems which are line compatible (suitable for interconnection) and which provide optional EIA RS232C or High Speed Digital Interface DTE interfaces. Also attaches via a Communications Adapter feature on the 4331 Processor ... see M 4331 pages for details.

IBM Modems: The following IBM modems can be used: 3863 (2400 bps), 3864 (4800 bps) or 3865 (9600 bps). Note: 4-wire Switched Network Backup is available on the 3863 mdl 1, 3864 mdl 1 and 3865 mdls 1 or 2. For communications capability, product utilization and features, see 3863, 3864, 3865 and M 2700 pages.

Supplies -- for 3203 Printer mdl 3 ribbons

Limitations -- the input/output capabilities outlined under "Highlights" are dependent on appropriate configurations of the terminal. The keyboard is standard on the 3777 mdl 2, while the 3203 Printer mdl 3 is a stand-alone unit. A minimum configuration includes a 3777 Communication Terminal mdl 2, a 3203 Printer mdl 3 and a 2502 Card Reader or a Diskette Input Device (#3201). If a Diskette Input Device is attached and a 2502 Card Reader is not present, a Console Display (#1601) is required.

Prerequisites: For BSC communications with S/360, S/370 or 4300 Processor -- the 3777 mdl 2 will interface to current host MULTI-LEAVING programming systems as a S/360 mdl 20 - Sub-model 5. BSC attachment can be made via a 3704/3705 Communications Controller, a 2701 Data Adapter Unit, or a 2703 Transmission Control attached to a channel of any S/360, S/370 or 4300 Processor supporting BSC MULTI-LEAVING Workstations. Also attaches via a Communications Adapter feature on the 4331 Processor.

Bibliography: GC20-0370

or #9881 for non-lock plug. See 3203 mdl 3 for 3-phase power requirements.

[2] Color: Blue is supplied as standard.

[3] Cabling: Fixed length cables are supplied as standard ... refer to Installation Manual - Physical Planning, GA27-3006 and to Customer Site Preparation Planning Guide, GA27-3103.

[4] International Print Support: #9351 ... provides support for modified AN, PN and SN Print Train Arrangements for the 1416 Interchangeable Train Cartridge corresponding to the 48, 64 and 94 character EBCDIC sets available for print belts for the 3776 Communication Terminal. Support is also provided for the QN, HN, AN, PN, RN and PCS-HN arrangements. See "Type Catalog." Note: Not recommended for field installation ... replaces the standard print support.

[5] EIA RS232C 19.2K BPS Line Speed: #9481 ... provides support of 19.2K bps. Provides diagnostics and is used for record purposes.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 Yr	Purchase	MMMC
	3777 2	\$422	\$359	\$14,360	\$79

Plan Offering: Plan B Machine Group: D Per Call: 1
Purchase Option: 50% Useful Life Category: 2 Warranty: B
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Upper Limit Percent: 0%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 2 to Model 3 ... \$6,440*

* Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this model change involves removal of parts which become the property of IBM" ... This Model Upgrade Price assumes Special Features #1601 and #1602 are installed on the Model 2. If they are not, an RPQ must be submitted.

SPECIAL FEATURES

[All special features can be field installed.]

AUDIBLE ALARM (#1390). Sounds an alarm that alerts the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. **Maximum:** One.



3777 Communication Terminal - Model 2 (cont'd)

COMMUNICATION DRIVER WITHOUT BUSINESS MACHINE CLOCKING (#1481). Required. Provides communication driver without clocking. **Maximum:** One.

CONSOLE DISPLAY (#1601). Provides a 1024 character (16 lines of 65 characters each) console information display. **Maximum:** One.

CONSOLE DISPLAY SPOOLING (#1602). Diskette storage device for spooling of console display messages. One device with a customer removable diskette placed in the left cabinet. Additional diskettes are available from IBM

Maximum: One. **Prerequisite:** Console Display (#1601).

DISKETTE INPUT DEVICE (#3201). Diskette storage device for reading of card image Basic Exchange datasets. One device with a customer removable diskette placed in the right cabinet. Additional diskettes are available from IBM

Maximum: One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk console cabinet door. **Maximum:** One. **Limitation:** The keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for both desk-console cabinet doors. **Maximum:** One. **Prerequisite:** Diskette Input Device (#3201). **Limitation:** The keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

EIA INTERFACE (#3701). Required. Provides an EIA RS-232C compatible interface and a cable for attachment of a modem. Speeds from 2400 bps to 9600 bps and at 19.2K bps are permitted. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). For 19.2 Kbps operation, #9481 is required. See item [5] under "Specify." **Limitation:** Cannot be installed with High Speed Digital Interface (#4501) or V35 Interface (#4720).

HIGH SPEED DIGITAL INTERFACE (#4501). Provides an interface and a cable for attachment to a modem which permits point-to-point synchronous operation at 19.2K bps on a Type 5703 or 8803 wideband channel. **Maximum:** One. **Prerequisite:** Communication Driver (#1481). **Limitation:** Cannot be installed with EIA Interface (#3701) or V35 Interface (#4720).

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with the feature. Refer to M 10000 pages for information on additional or replacement keys. **Maximum:** One.

V35 INTERFACE (#4720). Required for direct High Speed Local Attachment to a 3705-II at 14.4K bps with a maximum cable distance of up to 170 feet. **Limitation:** Cannot be installed with #3701 or #4501. **Field Installation:** Yes. **Prerequisite:** Communication Driver (#1481).

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read. See IRD Sales Manual for magnetically striped and encoded identification cards. A read operation can be initiated during an operator inquiry (SYS REQ function). Data read from the magnetic stripe card cannot be printed, displayed or written on the Console Display Spooling diskette. **Maximum:** One. **Prerequisite:** Console Display (#1601). **Limitations:** [1] The operator must position and slide the card through the reader-slot at a steady rate between 5 and 40 inches per second for a read operation ... [2] BSC programming does not support this feature.

PRINT SPEED ENHANCEMENT (#5595). Provides support for a 3203 Printer mdl 3 operating with Speed Enhancement (#6360) at 1200 lpm. **Maximum:** One.

2502 CARD READER ATTACHMENT (#8002). Provides for attachment of a 2502 Card Reader mdl A1, A2 or A3. **Maximum:** One.

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3251 can be equipped with special features for Card Read/ Punch Check and/or Card Print. **Maximum:** One. **Limitation:** The Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only.

Special Feature Prices:	MAC/ MRC	ETP/ MLC		Purchase	MMMC
		2 Yr			
Audible Alarm	#1390	\$40 SUC -		\$40	\$.50
Communication Driver					
w/o Bus Mach Ckling	1481	13	11	440	2.00
Console Display	1601	106	90	3,600	33.00
Console Display Spooling	1602	80	68	2,720	15.00
Diskette Input Device	3201	94	80	3,200	15.50
Door Keylock	3401	15 SUC -		15	NC
Door Keylock, Dual	3402	30 SUC -		30	NC
EIA Interface	3701	13	11	440	1.00
High Speed Digital Intfce	4501	41	35	1,400	1.00
Keylock	4650	35 SUC -		35	NC
V35 Interface	4720	15	13	510	2.00
Operator ID Reader	5450	13	11	440	1.50
Print Speed Enhancement	5595	18	15	600	NC
2502 Card Reader Attach	8002	29	25	1,000	4.50
3782/3521 Cd Pch Attach	8150	19	16	640	3.00

**IBM 3777 COMMUNICATION TERMINAL**
Model 3

Purpose: The 3777 mdl 3 is a high speed remote job entry terminal and is a member of the 3770 Data Communication System. The 3777 mdl 3 is an SNA Multiple Logical Unit (MLU) terminal. A keyboard and a console display are used for terminal control and for operator communication with the host CPU. Terminal operation may be controlled by the storage of operating procedures, terminal setups and local utility programs in terminal storage for use by the terminal operator. The 3777 is not designed as an interactive terminal. The printer is not integrated into the 3777 mdl 3 but is a stand-alone 3203 Printer mdl 3 which is cable attached to the 3777 mdl 3. Special features permit one or two diskette storage devices, one magnetic tape unit, one card reader and one card punch. One of three card readers can be selected for operation at speeds of 150, 300 or 400 cards per minute. The card punch operates at 50 cpm. A minimum configuration includes a 3777 mdl 3 and a 3203 mdl 3.

Maximum Lines Per Minute

Std 3203 mdl 3	Featured 3203 mdl 3	Character Set
1000	1200	48 AN, HN
998	1195	52 RN
870	1020	60 PN

Highlights:

Communications — transmission speeds from 2400 bps to 9600 bps and at 19.2K bps are provided using the appropriate modems and communications facilities. Duplex — simultaneous inbound/outbound — data transmission is provided on non-switched full duplex communication facilities only when communicating with an appropriately equipped 3705 Communications Controller with the supporting ACF/NCP/V5 level. May also be locally attached in either a duplex or half-duplex mode to a 3705 at 14.4K bps.

Keyboard — EBCDIC arrangement with 44 data keys. The keyboard in conjunction with a standard console display, indicator lights, function keys, operating mode switches and a 3-position numeric display provides operator control. Host application commands, System Services Control Point (SSCP) commands and local functions are entered from the keyboard. Data entered on the keyboard is displayed. If a keying error is made, Character Backspace and Character Advance may be used for editing. Character Backspace and Character Advance are non-destructive. Character Advance is typamatic. Reset returns to the position from which the Character Backspace began.

Console Display — contains 16 lines of 64 characters each for a total of 1024 characters. The 3777 mdl 3 reserves the bottom three lines of the display for operator keying, display of system information and prompting for information required for the execution of functions. The remaining 13 lines of the display are used to display messages between the terminal and the host application or the SSCP and to display information regarding terminal operations such as host input.

Lower case alphabets are converted to upper case before displaying. When the cursor is beneath a character any new data keystroke will cause the new character to replace the old. Overstrikes are not permitted.

Each message is displayed as it is received, except as described below. Each message is also written in terminal storage. At power on time the operator is prompted to specify date and time. As messages are received they are time-stamped prior to display and storage. Messages longer than a display line will wrap around to the next line with an indent to aid readability. The display fills from top to bottom. Subsequent new message lines replace the oldest message lines. The most recent message received is identified by the Greater Than sign > in the first position. The following line is blanked to assist the operator with message identification.

Function keys on the keyboard allow the operator to control the display function. The display can be held while incoming messages are sent to terminal storage and not displayed. If messages arrive during the "hold" state a message alert light notifies the operator. The operator may subsequently display the desired message group. A terminal utility program is available for listing or copying the message contents of terminal storage for external message retention and reference.

Printer — a stand alone 3203 Printer mdl 3 cable attached to the 3777 mdl 3. The 3203 mdl 3 uses the 1416 Interchangeable Train Cartridge. The 3777 mdl 3 supports fifteen Print Train Arrangements (AN, HN, OAA, ODA, ONA, OAB, GN, PCS-AN, PCS-HN, PN, QNC, QN, RN, SN, TN) as standard. When a substitute character is ordered to displace a character in one of the standard arrangements, the substitute character assumes the card and bit codes of the character it replaces. See "Type Cata-

log." International Print Support is provided supporting Print Train Arrangements corresponding to the 48, 64 and 94 character EBCDIC sets available for print belts for the 3776 Communication Terminal. Support is also provided for the QN, HN, AN, PN, RN and PCS-HN arrangements. The 3203 mdl 3 permits feeding continuous forms up to 20 inches wide and 132 print positions. Character spacing is 10 per inch; line spacing is 6 or 8 per inch under operator control. Maximum forms length is 24 inches when attached to the 3777 mdl 3. Refer to 3203 for further description of the 3203 mdl 3. Refer to "Type Catalog" for further description of the 1416 print train arrangements supported and for print speeds. Refer to GA24-3488 for forms design considerations.

Terminal Storage — is standard for message spooling, terminal control, utility programs and user generated procedures.

Diskette Storage — there are two diskette storage devices available as special features. While the devices are physically identical to those on the 3777 mdl 1, additional operational facilities such as data set concatenation enhance the use of the special feature diskette storage devices. Also, each special feature diskette storage device may be assigned individually to an independent host SNA session or used locally for input or output. Diskette operation is concurrent with other terminal functions.

Magnetic Tape — may be used as either an input or as an output device. One 3411 Magnetic Tape Unit and Control mdl 1 attachment is available as a special feature. The 3411 mdl 1 provides 9-track tape with recording densities of 1600 bpi Phase Encoded or 800 bpi NRZI. 7-track tape operation is not provided. The 3411 mdl 1 may be assigned to an independent host SNA session or be used locally for input or output. Labeled and unlabeled tapes are supported. Records are fixed or variable length and may be unblocked or blocked to a maximum block size of 4000 bytes. Maximum record size is 255 bytes. A block size of up to 2000 bytes automatically provides dual buffering. Magnetic tape operation is concurrent with other terminal functions. Refer to G232-0004 for detailed information on operation of the 3411 mdl 1. Refer to 3411 in "Machines" for ordering instructions. **Note:** Feature #7003 is required on the 3411 mdl 1.

Buffers — transfer data between the input and output devices and the communication line. SDLC communications uses a customer defined Request/Response Unit (RU) of up to 512 bytes. The actual transmission depends on session pacing values, data length, buffer availability and data availability. Buffers also transfer data between input and output devices during local operation.

Printer Format Controls — facilitate the formatting of printed data. Vertical control characters in data initiate vertical tabbing. Carriage control definition provides for specification of a variable number of line numbers per carriage stop with a maximum of 60 lines per carriage control definition. Carriage control definition may be defined at the terminal or may be sent dynamically by the host application. Extended Forms Definition is standard and utilizes terminal storage.

Compression/Expansion — implementation provides a compression option at the terminal for a job that reads data from cards, magnetic tape, or diskette to the line. An identifying sequence is substituted for each occurrence of two or more consecutive duplicate characters. Trailing blank truncation is standard. The terminal automatically expands the compression sequence to the correct number of blanks or duplicate characters for compressed transparent or non-transparent data received.

Decompaction — provides the decompaction function associated with the receipt of a compacted data stream whereby a pair of consecutive alphameric characters is represented by a single transmission byte. Function is dependent upon transmission by the host of a decompaction table corresponding to the compaction table used by host programming in creating the compacted job data stream. Decompaction occurs for data directed to the printer, card punch, magnetic tape and diskette (except 3770 format). Compaction by the terminal of data inbound to the host is not provided.

Automatic Card Reading — capability is under control of the operator. The "hot reader" function may be enabled/disabled at any appropriate operational time.

Job Control — initiated by the operator, pertains to online jobs with the host and local utility jobs run concurrently with the online jobs. Online job submission may be initiated at any time there is a SNA session available for data transmission. The terminal may have up to six concurrent sessions that are controlled by the operator. Online job input may consist of card, diskette or magnetic tape data. Data from different devices or data sets may be concatenated into a single input data stream as one job execution. Online job output may consist of printer, card, diskette or magnetic tape data.

3777 Communication Unit Model 3 (cont'd)

Local utility jobs may be defined by the operator and stored in terminal storage to provide the following functions:

Input	Output
Card	Printer, Magnetic Tape, Diskette, Card Punch
Magnetic Tape	Printer, Diskette, Card Punch
Diskette	Printer, Magnetic Tape, Diskette, Card Punch

Record Formats -- consist of card image, print image and 3770 format. Card image and print image, in addition to being applicable to card reader, card punch, printer and magnetic tape datasets, are also applicable to diskette as a function of Basic Exchange datasets (128 byte maximum).

Basic Exchange diskettes may be read by the terminal. Basic Exchange diskettes may also be written by the terminal, thereby creating a diskette for further Basic Exchange mode processing.

3770 format is applicable to diskette data recording which is to be subsequently printed or punched. 3770 format recording results in more efficient diskette utilization than does card or print image. Basic Exchange (card or print image) or 3770 format is a user specification in job control.

Input record size from both magnetic tape and diskette may be limited to 80 or 128 bytes, because of host programming considerations. In addition, the ability to concatenate multiple data sets, with different record lengths, into a single input job stream requires host programming support of a CDS-FM Header type 1 (Continue Destination Select).

Remote Power Off -- this feature can be used to conserve energy used by the terminal by providing the capability for the host CPU application program to initiate power down at the terminal by sending a controlled data sequence over communication facilities. The terminal must also be equipped with the appropriate communication special features. This capability is in addition to the standard power down switch which can be manually operated.

Encrypt/Decrypt Feature -- available to provide secure data transmission in conjunction with ACF VTAM Encrypt/Decrypt Feature (Program Number 5735-RC2) (Feature Number 6010) and Programmed Cryptographic Facility Program Product (Program Number 5740-XY5).

Performance Considerations -- the line-to-line printer performance of the 3777 mdl 3 and attached 3203 mdl 3 is up to 1000 lpm [up to 1200 lpm with Speed Enhancement (#6360) on the 3203 mdl 3 and Print Speed Enhancement (#5595) on the 3777 mdl 3 itself with 48 character AN or HN set, and up to 870 lpm [up to 1020 lpm with #6360 on the 3203 and #5595 on the 3777] with a 60 character PN set.

The 3777 mdl 3 MLU terminal will operate, however, with concurrent input-output processing in either a duplex or half-duplex data communications mode as a function of the base Multiple Logical Unit capability. The card reader, punch, diskette storage devices, magnetic tape unit and display console may have a degrading effect on printer performance during concurrent operations.

The degree of degradation which may occur will tend to be greater when half-duplex communications are employed as opposed to duplex communications and system facilities in support of the concurrent inbound-outbound data stream capability of the terminal.

Actual terminal device throughput depends upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application processing, SNA pacing, cryptographic processing, etc., must all be considered in determining actual throughput.

In general, duplex data communications operation will tend to provide greater terminal throughput under concurrent input/output functions than a half-duplex communications mode. The 3777 mdl 3 operating duplex at 19.2K bps on a terrestrial link may, however, present a variance of from greater to degraded overall terminal throughput when compared to comparable operation in a half-duplex mode.

Problem Determination Procedures -- Function has been designed into this unit to help provide availability to the customer. See IBM 3770 Multiple Logic Unit Operator's Guide for 3776-3, 3776-4, 3777-3.

Customer Responsibilities: It will be a customer's responsibility to use and follow the Problem Determination Procedures and to fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Communications: See "Special Features." Transmission speeds from 2400 bps to 9600 bps and at 19.2 Kbps. Point-to-point and multipoint transmission capability over switched or non-switched facilities allowed by selecting the appropriate modem and communication facility. Speeds above 4800 bps are on non-switched

facilities. Direct local attachment to a 3705-II at 14.4K bps. EBCDIC is the standard transmission code. ASCII is available as a special feature. Refer to M 2700 pages for information on customer responsibilities, communication facilities, and other attachment information.

For 19.2 Kbps, the 3777 mdl 3 may use either the EIA Interface or the High Speed Digital Interface to communicate through an appropriate modem and communication facility with a 3704/3705 Communications Controller equipped with Line Set Type 1G (#4717) at the central processing unit. This type of communication requires modems which are line compatible (suitable for interconnection) and which provide optional EIA RS232C or High Speed Digital Interface DTE interfaces.

Also attaches via a Communications Adapter special feature on a 4331 Processor. The 4331 must be equipped with a Local Attachment Interface (#4801) and its prerequisites ... see "Special Features" under 4331.

IBM Modems: The following IBM modems can be used: 3863 (2400 bps), 3864 (4800 bps) or 3865 (9600 bps). Note: 4-wire Switched Network Backup is available on the 3863 mdl 1, 3864 mdl 1 or 3865 mdls 1 or 2. For communications capability, product utilization and features, see 3863, 3864, 3865 and M 2700 pages.

Supplies: 3203 mdl 3 ribbons.

Limitations: The input/output capabilities outlined under "Highlights" depend on appropriate configurations of the terminal. Keyboard, console display, and terminal storage are standard. The 3203 Printer mdl 3 is a standalone unit. A minimum configuration includes a 3777 mdl 3 and a 3203 mdl 3. One communications feature (#3701, 4501, 5650 or 5651) is required. For other configurations, refer to "Special Features" below.

The duplex data communications capability of the 3777 mdl 3 is operational on non-switched full duplex communications facilities only.

Communications Adapter: An integrated communications adapter without business machine clocking is standard ... provides SDLC communications over switched or non-switched facilities.

Prerequisites for SDLC Communications with S/370 or a 4300 Processor: A 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage S/370 Processor or 4300 Processor operating under VS1, MVS or DOS/VS using RES, JES2, JES3, POWER/VS and VTAM. Note: MVS and JES3 are not supported by the 4300 Processors.

An appropriately featured 3705 operating under the appropriate level of Network Control Program (ACF/NCP/VS) is required for duplex data stream operation.

Bibliography: GC20-0001

SPECIFY

- Voltage** (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. See 3411 mdl 1 for magnetic tape unit voltage requirements ... see 3203 mdl 3 for 3-phase power requirements.
- Color:** Blue is supplied as standard.
- Cables:** Fixed length cables are provided as standard, except for the 3411. See *Installation Manual - Physical Planning, GA27-3006*. 3411 cables must be ordered separately.
- EIA RS232C 19.2 Kbps Line Speed:** #9481 ... provides support of 19.2 Kbps ... used for record purposes.
- Alternate Address:** #9011 ... for record purposes only. Order this optional feature to specify that diskettes containing terminal code updates are to be mailed to an alternate address using a Teleprocessing Control number (TPC). The alternate address selected is usually the central site location.

PRICES:	Mdl	MRC	MLC 2 Yr	Purchase	MMMC
	3777 3	\$611	\$520	\$20,800	\$163

Plan Offering: Plan B Machine Group: D Per Call: 1
 Purchase Option: 50% Useful Life Category: 2 Warranty: B
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%

MODEL UPGRADE PURCHASE PRICES (There are no additional installation charges)

Model 1 to Model 3 ... \$11,240†
 Model 2 to Model 3 ... \$ 6,440* †

* Model Upgrade Price assumes Special Features #1601 and #1602 are installed on the Model 2. If they are not, an RPQ must be submitted.



3777 Communication Unit Model 3 (cont'd)

† Customer price quotations and customer acknowledgement letters for purchase must state: "Installation of this model change involves removal of parts which become the property of IBM."

SPECIAL FEATURES

[All special features can be field installed, except #1201 for which field installation is not recommended.]

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with diskette storage features (ASCII is written on the diskette). Orders for #1201 must also specify one print belt, #9493 for 48 character ASCII, #9494 for 64 character ASCII, or #9495 for 94 character ASCII. **Maximum:** One. **Field Installation:** Not recommended.

AUDIBLE ALARM (#1390). Sounds an alarm that alerts the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. **Maximum:** One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. **Maximum:** One. **Limitation:** The keys provided for this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for both desk-console cabinet doors. **Maximum:** One. **Prerequisite:** Diskette Storage, 2nd (#4902). **Limitation:** the keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

ENCRYPT/DECRYPT (#3680). Provides cryptographic data transmission in conjunction with program support in the host. Includes a security keylock. Each machine will have its own unique key. Two identical keys are supplied with the feature. **Maximum:** One. **Note:** A mercury battery, IBM Part No. 1743456, or equivalent, is required. A battery is shipped with this feature. See M 10000 pages for additional or replacement batteries. Replacement of the discharged battery is the customer's responsibility.

EIA INTERFACE (#3701). Provides an EIA RS232C compatible interface and a cable for attachment to a modem. Speeds from 2400 bps to 9600 bps and at 19.2 Kbps are permitted. **Maximum:** One. **Limitation:** Cannot be installed with High Speed Digital Interface (#4501), DDS Adapter, Point-to-Point (#5650), DDS Adapter, Multipoint (#5651) or V35 Interface (#4720). **Prerequisite:** For 19.2 Kbps operation, #9481 is required ... see item 5 under "Specify."

HIGH SPEED DIGITAL INTERFACE (#4501). Provides an interface and a cable for attachment to a modem which permits point-to-point and multipoint synchronous operation at 19.2K bps on a Type 5703 or 8803 wideband channel. **Maximum:** One. **Limitation:** Cannot be installed with EIA Interface (#3701), DDS Adapter, Point-to-Point (#5650), DDS Adapter, Multipoint (#5651) or V35 Interface (#4720).

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to keyboard or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with the feature. Refer to M 10000 pages for information on additional or replacement keys. **Maximum:** One.

V35 INTERFACE (#4720). Required for direct High Speed Local Attachment to a 3705-II at 14.4K bps with a maximum cable distance of 170 feet. **Limitation:** Cannot be installed with EIA Interface (#3701), High Speed Digital Interface (#4501) or DDS Adapter (#5650 or 5651). **Field Installation:** Yes.

DISKETTE STORAGE, 1ST (#4901). One device with a customer removable diskette is placed in the left cabinet. Additional diskettes are available from IBM. Characteristics of the diskette storage device are: one movable read/write head; one read/write surface, 73 data tracks; 26 sectors per track and 128 bytes per sector. Up to 1898 128-byte records. Data may be stored in either a Basic Exchange dataset or in a 3770 format dataset. Diskette capabilities allow for:

Concatenate (pool) ... the ability to concatenate on a dataset basis.

Multivolume ... allows a read or write operation to automatically continue to diskette 2 if it has been placed in ready condition, or it may continue on the current drive.

Maximum: One.

DISKETTE STORAGE, 2ND (#4902). Provides a second diskette storage device with the same characteristics as the 1st. It is placed in the right desk cabinet which is also supplied by this feature. The second diskette allows additional capabilities for:

Copy ... data can be copied from diskette 1 to diskette 2.

Maximum: One. **Prerequisite:** Diskette Storage, 1st (#4901).

OPERATOR ID FEATURE (#5450). Provides for reading magnetic

stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8 ranging from 0.007" to 0.045" thick may be read. Data read from the magnetic stripe card cannot be printed or displayed. **Maximum:** One. **Limitations:** The operator must position and slide the card through the reader-slot at a steady rate between 5 and 40 inches per second for a read operation.

PRINT SPEED ENHANCEMENT (#5595). Provides support for a 3203 Printer mdl 3 operating with Speed Enhancement (#6360). **Maximum:** One.

DDS ADAPTER (DDSA) (#5650 - For Point-to-Point Operation ... #5651 - For Multipoint Operation). Provides an adapter for SDLC data transmission at speeds of 2400, 4800 or 9600 bps over the AT&T non-switched Dataphone* Digital Service network. The DDSA interfaces to a DDS channel service unit, the customer site termination of the DDS network. **Specify:** #9822 for 2400 bps, #9823 for 4800 bps, or #9825 for 9600 bps. **Maximum:** One, #5650 or #5651. **Limitation:** Cannot be installed with EIA Interface (#3701), High Speed Digital Interface (#4501), or V35 Interface (#4720).

3411 MAGNETIC TAPE UNIT AND CONTROL MDL 1 ATTACHMENT (#7801). To attach one 3411 Magnetic Tape Unit and Control mdl 1. **Maximum:** One. **Prerequisite:** Feature #7003 on the 3411 mdl 1.

2502 CARD READER ATTACHMENT (#8002). Provides for attachment of a 2502 Card Reader mdl A1, A2 or A3. **Maximum:** One. **Limitation:** Optical Mark Read on the 2502 is not supported.

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. **Maximum:** One. **Limitation:** The card read/punch check special feature on the 3521 is limited to the punch checking function only.

Special Feature Prices:	MLC			
	MRC	2 Yr	Purchase	MMMM
ASCII Feature	#1201	\$18	\$15	\$600 \$50
Audible Alarm	1390	40 SUC -		40 .50
Door Keylock	3401	15 SUC -		15 NC
Door Keylock, Dual	3402	30 SUC -		30 NC
Encrypt/Decrypt	3680	47	40	1,600 2.00
EIA Interface	3701	13	11	440 1.00
Hi Spd Digital Interface	4501	41	35	1,400 1.00
Keylock	4650	35 SUC -		35 NC
V35 Interface	4720	15	13	510 2.00
Diskette Storage, 1st	4901	69	59	2,360 15.00
Diskette Storage, 2nd	4902	69	59	2,360 6.50
Operator ID Reader	5450	13	11	440 1.50
Print Speed Enhancement	5595	18	15	600 NC
DDS Adapter, Pt-to-Pt	5650	24	20	840 2.00
DDS Adapter, Multipt	5651	24	20	840 2.00
3411 Mdl 1 Attachment	7801	118	100	4,000 14.00
2502 Cd Rdr Attachment	8002	29	25	1,000 4.50
3782/3521 Cd Pch Attach	8150	19	16	640 3.00

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the part number indicated below at the price listed in the M 10000 pages, see M 10000 for additional information and field installation.

Mercury Battery (Part No. 1743456). Provides power to sustain the master key of the Encrypt/Decrypt feature (#3680) when normal power is not present. This accessory is a 4 volt non-rechargeable mercury battery. This battery has a shelf life of 1 year under normal conditions, and can be expected to provide 3.5 years of normal operation. **Note:** Discharged battery should be returned to IBM.

* Registered Trademark of AT&T.

**IBM 3780 COMMUNICATIONS TERMINAL**

Purpose: A data transmission terminal using the BSC technique. It can communicate over appropriate communications facilities to another 3780, a S/360 mdl 22 - 195, any S/370 or 4300 Processor, a 2770 Data Communication System, or a 2780 Data Transmission Terminal. May be locally attached to a 3704/3705 Communications Controller. For requirements, see "Prerequisites."

NOTE: For possible use with S/360 mdl 20, System/3 and 1131, see GSD Manual.

Highlights: Provides medium speed, batch-oriented, buffered card reading and printing via appropriate communications facilities ... see "Communications Facilities." Punched card output provided via attachment of a 3781 Card Punch ... see 3781.

Card Reader -- reads at a rated speed of 600 cards/minute. Provides hopper capacity of 1200 cards and stacker capacity of 1300 cards. Only 80 column cards can be read.

Printing -- prints at a rated speed of 350 lines/minute utilizing the basic 52-character set. Interchangeable type bars of 39 and 63 character sets are available with rated speeds of 425 lpm and 300 lpm respectively. Only the 63 character set may be employed when using ASCII transmission code. The printer provides 120 print positions standard with feature expansion to 144 positions ... see "Special Features." Horizontal and Vertical Format control are provided as standard functions of the printer.

Buffers -- provides two 512-character buffers which service the transmission line and the I/O units alternately to provide overlap operation for efficiency.

Buffer Checking -- all characters are checked on the data path when sent to or received from the buffer.

Variable Record Length -- end-to-end characters are used to define the end of a record, allowing for complete variable length. Full buffer blocks with variable length records can be transmitted or received. On card transmission, blank positions are removed from the end of the card record to increase the transmission efficiency.

Space Compression/Expansion -- operable under switch control, this capability provides for the removal of consecutive spaces in transmitted data and their re-insertion in received data. A two character sequence is substituted for from two to sixty-three consecutive spaces. If more than sixty-three consecutive spaces are to be transmitted, a second two character sequence will be substituted for the number of consecutive spaces greater than sixty-three. If only one space is to be transmitted, it will be transmitted as a normal space. This feature is inoperable when transmitting in transparency or operating in home mode.

Home Mode -- provides card reader to buffer to printer operation in off-line non-communications mode.

Integrated 2400/1200 BPS Modem -- provides 2400 bps transmission with half speed backup on leased and switched facilities ... compatible with IBM 3872 Modem.

Conversation Mode -- allows a CPU to turn the communications line around after receiving text and return text without additional selection.

Audible Alarm -- alerts the operator when manual intervention is required in line mode ... unattended operation is not provided.

Communications Facilities: The 3780 operates in half duplex mode over facility C4, C5, C6, D3, D4, D4SB, D5, D5SB, D6, D6SB, X1M or X2M ... for information concerning these facilities, see M 2700 pages. The alphanumeric facility designations above correspond to those shown on the charts on those pages.

Binary Synchronous Transmission: Allows for transmission rates of 1200, 2000, 2400, 4800, 7200/3600 bps ... see "Modems" below and Data Set Attachment under "Specify."

Communications can be with another 3780, 2772, 2780 mdl 1, 2 or 4, a S/360 mdl 22 thru 195 (except mdl 44 or mdl 67 in TSS mode), or any S/370 or 4300 Processor ... for requirements, see "Prerequisites."

In addition, the 3780 may be multi-dropped on the same line facility with other BSC devices (1826, 2715, 2772, 2780, 3271, 3272, 3735) as tributary stations on a multi-point line with a S/360 mdl 22-195 (except mdl 44 or mdl 67 in TSS mode), or any S/370 or 4300 Processor as the control station. In a switched control network, it may use the same termination (phone number) at the computer that is used for the other BSC devices.

Transmission Code: One of two codes can be selected ... see "Specify." For printable graphics, see "Type Catalog."

EBCDIC Code -- 256 character set which is the basic code of S/360, S/370 and 4300 systems.

ASCII Code -- Industry standard code with a 128 character set.

Transmission Checking: A redundancy check is performed on all data. EBCDIC uses a 16-bit cyclic check transmitted as two 8-bit bytes ... ASCII uses an odd-parity VRC on each character, including the LRC character and an LRC check transmitted as a single 8-bit odd parity byte. Format check plus an odd/even block check is provided on both code sets.

Modems: One Integrated 2400/1200 bps Modem feature, *IBM 3863 Modem (2400/1200 bps)*, *IBM 3872 Modem (2400/1200 bps)*, *IBM 3864 Modem (4800/2400 bps)*, *IBM 3874 Modem (4800/2400 bps)*, *IBM 3875 Modem (7200/3600 bps)*, or *IBM 4872 Modem (4800 bps)* can be attached to the 3780. For communications capabilities, product utilization, and special features, see 3863, 3864, 3872, 3874, 3875 and M 2700 pages, and Integrated Modem under "Special Features" below.

Card Limitations: Generally, scored cards require careful handling and a favorable environment. Use of the following scores has been approved.

Internal Scores (before separation) -- M-4, M-5, OM-2, OM-3, S-1 and ID-3 (2" x 3-1/4" or 2-3/16" x 3-3/4" sizes only). **NOTE:** When using OM-2 or OM-3, reading must be terminated prior to the scored column.

External Scores (after separation) -- M-3, M-4, M-5, M-6, M-7, M-11, OM-2, CF-4 and CF-11. OM-3 may be used if the score is on the column 1 end. **NOTE:** Upper left corner cut required when the M-11 or CF-11 is used on the column 1 end.

All other scores may result in unsatisfactory performance.

Aqua cards and C-4 corner cut cards cannot be used.

Customer Responsibilities: See M 2700 pages. In addition, the customer must be advised that when non-IBM data sets or privately owned communications facilities are used, he is responsible for insuring that signal levels and impedances are compatible with the IBM communications interface.

PREREQUISITES:

S/360 mdl 25 -- communications can be via the Integrated Communications Attachment (#4580) with appropriate binary synchronous features on the 2025, or via a 2701 Data Adapter Unit or 2703 Transmission Control ... see below.

S/360 mdl 22-195 (except mdl 44 or 67 in TSS mode), or any S/370 Processor -- communications can be via a 2701 Data Adapter Unit or 2703 Transmission Control equipped with appropriate binary synchronous features ... see 2701, 2703. **NOTES:** [1] To utilize OLT support, the host processor requires a minimum of 32K bytes of storage ... [2] The 3780 communicates only in EBCDIC or ASCII codes ... [3] Only EBCDIC Transparency (#3601) is available on the 3780. Therefore, a 2701 or 2703 must be configured with 3780 restrictions and limitations for compatibility ... [4] All 3780s on a multi-point line must have the same code, EBCDIC or ASCII.

S/360 (except mdls 22, 25, 44, 67 in TSS mode or 85), or any S/370 Processor -- communications can be via a 3704/3705 Communications Controller ... see 3704, 3705. **NOTE:** See the 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

S/370 mdl 115, 125, 135, 135-3, 138 -- communications can be via the Integrated Communications Adapter (#4640) and appropriate binary synchronous features on the 3115, 3125, 3135, 3135-3, 3138 as well as via a 2701, 2703 or 3704/3705.

4300 Processors -- communications via a 2701, 3704 or 3705 to all 4300 Processors, and via the Communications Adapter feature on the 4331. See 2701, 3704/3705, 4331 and 4341 for details and prerequisites.

3704/3705 Medium Speed Local Attachment -- attachment without modem at speeds up to 2400 bps via IBM-provided cables. Requires Synchronous Clock ... see "Specify."

2770 Data Communication System -- communications require Terminal Use (#9711) and the same Transmission Code (#9761 or #9762) on both units. The 2772 must have Buffer Expansion, Add'l (#1491), or both the 3780 and the 2772 must have EBCDIC Transparency.

Another 3780 -- communications require Terminal Use (#9711) and the same Transmission Code (#9761 or #9762) on both units ... see "Specify."

2780 Data Transmission Terminal (mdls 1, 2, 4 only) -- communications require that both terminals have EBCDIC Code (#9761 on 3780, #9762 on 2780) and EBCDIC Transparency (#3601 on 3780, #8030 on 2780). Communications can be in EBCDIC Transparency mode only. The 3780 may not have multiple records in Transparent mode.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.



3780 Communications Terminal (cont'd)

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9884 for 208 V or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Transmission Code: #9761 for EBCDIC or #9762 for ASCII ... can be field installed.

[3] Character Set: ONE of the available character sets and the type size MUST be specified at no charge on the initial order ... see "Type Catalog" for specified characters in each set and price for additional sets.

[4] Printer Tape Punch: Order under Part No. 120910 ... ONE punch is furnished PER INSTALLATION at no charge.

[5] Identification: #9350 ... provides an identification function by which a CPU under stored program control and operating on a switched public network, can identify a legitimate 3780. **PREREQUISITE:** Switched Network Control (#7651).

[6] Terminal Use (point-to-point): #9711 ... for communications with another 3780, 2772 or 2780. Provides "Bell" key and light indicator to signal remote terminal that voice mode is desired. Receipt of "Bell" code sounds alarm. Can be installed in the field. When communications is alternately with a CPU and another 3780, 2772 or 2780, via switched network, specify #9711.

[7] 3704/3705 Medium Speed Local Attachment: Specify Modem or Data Set Attachment ... see item [8] below. #9121 (2400 bps) or #9122 (1200 bps). Also Communications Facilities ... see item [9] below. #9402 for half-duplex.

[8] Modem or Data Set Attachment: One of the following, depending upon facility to be used must be specified: #9120 for C5 (2000 or 2400 bps) or D4M (2000 bps), #9121 for D4 or X1M (2400 bps), #9122 for D3 (1200 bps), #9123 for C4 (1200 bps), #9124 for D5 or X2M (4800 bps), #9125 for D4SB (2400/1200 bps), #9126 for D6 (7200 bps), #9127 for D6SB (7200/3600), #9128 for C6 (4800/2400 bps), or #9129 for D5SB (4800/2400 bps). Can be installed in the field. **NOTE:** #9120 required with #5610, #9121 with #5600/5602 without #7951, #9125 with #5600/5602 with #7951 ... if Public Switched Network Facility C5 is used at data rate above 2400 bps, specify #9128 in lieu of #9120. **PREREQUISITE:** #9122 or #9123 may require Synchronous Clock (#7705) ... see "Special Features."

[9] Communications Facilities: #9402 for half-duplex, or #9404 for duplex. Can be changed in the field. **NOTE:** Features specify 3780 control of the data set and do not necessarily correspond to the communications facility. Specify as indicated below:

- Switched Network Operation -- #9402.
- Leased Private Line (or equivalent privately owned). Multi-point -- #9402 (half-duplex), although the communications facility may be 2-wire or 4-wire.
- Point-to-point -- #9402 for 2-wire (half-duplex) communications facilities ... #9404 for 4-wire (full duplex facilities). **NOTE:** If 3780 Integrated Modem, IBM 3872, 3874 or 3875 Modem is used, specify #9402.

[10] Extended Retry Transmission: #9150 -- extends the maximum retry count from three (12 seconds) to a maximum of fifteen (48 seconds) in an effort to recognize a valid response to the last block of data transmitted, prior to sending an EOT code and timing out with an error condition. Can be changed in the field.

[11] Data Set Cable: A 20' data set cable is provided as standard. If a longer cable is required, specify #9021, indicating length as a quantity of 25, 30, 35 or 40.

[12] WACK Response (Wait before transmit-positive acknowledge): #9936 ... if initial WACK is to be transmitted immediately. All subsequent WACK responses are transmitted after a 2-second delay. Can be changed in the field.

[13] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
	3780	1	\$1,054 \$ 897	\$21,680	\$341

Plan Offering: Plan B Purchase Option: 50% Machine Group: A
Warranty: B Useful Life Category: 1 Per Call: 2
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

* If Data Set Cable longer than 20 ft. is required, specify #9021 plus length ... see Specify [11].

SPECIAL FEATURES

Communications Special Features -- use of the following special features depends upon the communications application(s) for which the specific 3780 is to be used.

COMPONENT SELECTION (#1601). Provides the capability of specific 3780 I/O device selection. In addition to component selection, it provides priority output selection and multi-point Data Link Control Component Selection capability. It is a prerequisite for attachment of a 3781 Card Punch. **Field Installation:** Yes.

EBCDIC TRANSPARENCY (#3601): Allows the 3780 to receive and transmit all 256 EBCDIC bit combinations as data characters. Variable length records cannot be transmitted if card I/O or printer is selected. Either normal or transparent text can be RECEIVED without the "Transparency" switch being in the transparency position. The switch must be ON for TRANSMITTING in transparency. If a terminal on a multi-point line requires this feature, all terminals on that line must also have this feature. **Field Installation:** Yes. **Prerequisite:** EBCDIC Transmission Code (#9761).

KEYLOCK (#4650): A key-operated Power-On switch for the 3780. The key must be inserted and turned to the "On" position before the control unit Power-On switch is operative. When the key is turned off, power is removed from the control unit. For additional or replacement keys, see M 10000 pages. **Field Installation:** Yes.

MULTI-POINT DATA LINK CONTROL (#5010). Allows multiple 3780s to be used on the same communications line with a CPU. Terminal can be polled or selected when operating as a tributary station on a multi-point system. All 3780s installed on the same line facility require this feature and must use the same transmission code and data set attachment. Other BSC devices (2772, 2780, S/360, S/370 or 4300 Processors) as tributary stations, can be on a multi-point line with a processor control station. **Limitation:** If Terminal Use (#9711) is installed, it must be removed prior to installation of this feature. **Field Installation:** Yes.

INTEGRATED 2400/1200 BPS MODEM (#5600, 5602, 5610). Provides an integrated 2400 bps modem with half speed backup capability. Equivalent to and compatible with similarly featured IBM 3872 Modems. Three versions cover different communications requirements, as described below. Operator controls are integrated with the 3780 operator panel. Built-in diagnostic functions are provided for local and remote testing. See M 2700, M 3782 pages and "Prerequisites" above for additional information on allowable machine/system combinations and required features. **Maximum:** One #5600, #5602, or #5610.

Leased Line Point-to-Point Modem (#5600) -- operates over D4 or (with Switched Network Backup, #7951) D4SB facilities with a similarly equipped 3780 or a 2770, 2780, 3780, S/360, S/370 or 4300 Processors equipped with appropriate features and an equivalent featured IBM 3872 Modem. Includes manual equalization control. **Field Installation:** Yes. **Prerequisites:** Submit an RPQ for operation on a basic 3002 channel. Modem or Data Set Attachment #9121 (#9125 with Switched Network Backup, #7951), Half Duplex (#9402) Communications Facilities Control. Terminal Use (#9711) may be required, depending upon application.*

Leased Line Multipoint Tributary Modem (#5602) -- operates on a multipoint network with a controlling CPU. Other 3780s on the same line facility must have either this feature or an IBM 3872 Modem with Multipoint Tributary (#5101 or #5102); other BSC tributary devices on the same line facility must have an IBM 3872 Modem with #5101 or #5102. Utilizes D4 or (with Switched Network Backup, #7951) D4SB Facilities. Includes manual equalization control. **Field Installation:** Yes. **Limitation:** Terminal Use (#9711) cannot be installed. **Prerequisites:** Submit an RPQ for operation on a basic 3002 channel. Modem or Data Set Attachment #9121 (#9125 with Switched Network Backup, #7951), Half Duplex (#9402) Communications Facilities Control, Multipoint Data Link Control (#5010).*

Switched Network Modem (#5610) -- operates over the Switched Network facility C5 with a similarly equipped 3780 or a 2770, 2780, 3780, S/360, S/370 or 4300 Processors equipped with appropriate features and an equivalent featured IBM 3872 Modem with Switched Network (#7941 or #7942). Provides automatic line equalization. Provides automatic answering/disconnect capability when used in conjunction with Switched Network Control (#7651). **Field Installation:** Yes. **Prerequisites:** Half Duplex operation (#9402), Modem Attachment (#9120).*

PRINT POSITIONS, ADDITIONAL (#5701). Provides an additional 24 print positions for the 3780 printer. **Field Installation:** Yes.

SWITCHED NETWORK CONTROL (#7651). To attach to a switched network, provides automatic answering of incoming calls initiated by another terminal or central computer over common carrier switched (dial-up) facilities. The line must be equipped with

3780 Communications Terminal (cont'd)

an appropriate data set with auto answer capability and the terminal must be in a "ready" status. Provides automatic disconnect when disconnect sequence is received or when no data is transmitted/received for 20 seconds. Disconnect causes audible alarm to sound. **Specify:** #9850 for use with the IBM 3874 Modem. **Field Installation:** Yes.

SYNCHRONOUS CLOCK (#7705). A synchronous clock for use with modems which do not have an internal clock, or for use with 3704/3705 Medium Speed Local Attachment Line Set, Type 1F. Will operate at 1200 bps or 2400 bps. The device with which the 3780 will communicate must also have an internal clock operating at the same bps rate. **Specify:** #9702 for 1200 bps, or #9704 for 2400 bps. **Field Installation:** Yes.

SWITCHED NETWORK BACKUP (#7951). Provides alternate operation on facility D4SB for Leased Line Point-to-Point (#5600) or Multipoint Tributary (#5602) feature. Auto answer is not provided. Half duplex mode of modem operation is forced when this feature is selected by the operator panel "Mode" switch; a "Talk/Data" switch is provided. This feature can be used with OS/DOS BTAM in certain configurations. Additional use program routines will be required to fully utilize the capabilities of this feature. For additional information see IBM Modem Marketing Guide. *Note: 4-wire Switched Network Backup is available on the 3863 mdl 1 and 3864 mdl 2. For product utilization and feature, see 3863 or 3864.* **Field Installation:** Yes.

Special Feature Prices:		ETP/		Purchase	MMMC
		MAC/ MRC	MLC 2 yr		
Component Selection	#1601	\$ 19	\$16.00	\$ 407	\$ 1.00
EBCDIC Transparency	3601	12	10.00	260	1.00
Keylock	4650	35	SUC —	35	NC
Multi-Pt Data Link Cntrl	5010	19	16.00	390	1.00
Int. 2400/1200 bps Modem					
Leased Line Pt-to-Pt	5600	90	77.00	2,115	14.00
Leased Line Mltipt Trib	5602	98	83.00	2,295	15.50
Sw Network Modem	5610	105	89.00	2,425	17.50
Print Positions, Add'l	5701	58	49.00	1,165	3.00
Sw Network Control	7651	19	16.00	390	1.00
Synchronous Clock	7705	32	27.00	650	1.00
Sw Network Backup	7951	10	8.50	260	3.00

3781 CARD PUNCH

Purpose: Punched card output unit for a 3780 Data Communications Terminal.

Highlights: Provides 80 column card output at a rated speed of 160 columns per second. Punches serially with actual throughput dependent upon number of columns punched, communications facility, and 3780 features employed. Refer to the 3780 Component Information manual for throughput calculations.

A free standing unit, cable attached within seventeen feet of the supporting 3780. It has a 1200-card capacity hopper and a 1300-card capacity prime stacker. Echo pulse check of punched data is provided by the 3781 in addition to conventional transmission checking provided by the 3780. Error cards are laced in card column 82 and stacked in secondary stacker.

The unit may be used in home mode in conjunction with the 3780 card reader to create punched card output media.

Only one 3781 can be attached to a 3780 Data Communications Terminal.

PREREQUISITES: A 3780 equipped with Component Selection (#1601) ... see 3780.

Card Limitations: Heavy duty cards, aqua cards, and C-4 corner cut cards cannot be used. Scored cards require careful handling and a favorable environment. Recommended use of scored cards is limited to the following:

Internal Scores (before separation) -- S-1, ID-1, ID-2, and for a maximum of three passes, M-4 and M-5.

External Scores (after separation) -- M-7, M-11 (with round corners), CF-11 (with round corners) on either end of the card, and M-3 on column 80 end only.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V. Must be consistent with that specified for the 3780.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Transmission Code: #9761 for EBCDIC, or #9762 for ASCII. Specify the same as that for the 3780. Can be field installed.

PRICES:	Mdl	ETP/		Purchase	MMMC
		MAC/ MRC	MLC 2 yr		
3781	1	\$ 401	\$ 341	\$ 8,500	\$ 69

Plan Offering: Plan B Purchase Option: 50% Machine Group: A
Warranty: B Useful Life Category: 1 Per Call: 2
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

IBM 3782 CARD ATTACHMENT UNIT

IBM 3784 LINE PRINTER

Purpose: Used to attach the 2502 Card Reader mdl A1 or A2 to a 3774, 3775 or 3776 Communication Terminal mdl 1 or 2, or 3289 Printer mdl 3 (2502 mdl A1 only), or to attach a 3521 Card Punch to a 3771, 3774, 3775, 3776 or 3777 Communication Terminal mdl 2 or 3, or 3289 Printer mdl 3. Used to attach the 2502 Card Reader mdl A3 to a 3776 Communication Terminal mdl 3 or 4.

Model 1 Attaches a 3521 Card Punch.

Model 2 Attaches a 2502 Card Reader mdl A1, A2, or A3.

Model Changes: Not recommended for field installation.

Highlights: The unit supplies power and attachment circuits and serves as a stand for mounting the card machine.

PREREQUISITES:

Model 1 -- requires 3782/3521 Card Punch Attachment (#8150) on the 3289 mdl 3, 3771, 3774, 3775, 3776 or 3777 mdl 2 or 3 and a 3521 Card Punch.

Model 2 -- requires 3782/2502 Card Reader Attachment (#8149) on the 3289 mdl 3, 3774, 3775 or 3776 mdl 1 or 2 and a 2502 Card Reader mdl A1 or A2. Requires 3782/2502 Card Reader Attachment (#8149) on the 3776 mdl 3 or 4 and a 2502 Card Reader mdl A1, A2 or A3. The following specify features are required on the 2502: #9901 for 115 V AC, and #9046 for white color.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual - Physical Planning, GA27-3006.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3782	1	\$ 41	\$ 35	\$ 1,400	\$ 2.00
	2	59	50	2,000	1.50

Plan Offering: Plan B Purchase Option: 60% Machine Group: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES

OPTICAL MARK READ (#5455). [Model 2 only] Required when the attached 2502 is equipped with Optical Mark Read (#5450). **Maximum:** One. **Limitations:** Refer to 2502 writeup for feature description and card limitations. Not permitted if the 2502 is attached to a 3776 mdl 3 or 4 or a 3777. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Optical Mark Read	#5455	\$ 25	\$ 21 \$ 840	\$ 1.50

Purpose: A line printer for attachment to a 3774 Communication Terminal for use as a second printer or attachment to a 3651 Model 50 Retail Store Controller or 3651 Model 75 Programmable Store Controller.

Highlights: Maximum print speed of 155 lpm with 48 character set, 120 lpm with 64 character set, or 80 lpm with 94 character set. Line printing is from characters engraved on a revolving metal print belt.

Included as standard is one interchangeable print belt (48, 64 or 94 character set) ... see "Specify." A variable width forms tractor for feeding continuous forms up to 15" overall width, paper jam detection, compress/expand, printer forms control, dual buffers, and 132 print positions. Character spacing is 10 per inch, line spacing is 6 or 8 per inch.

Limitations: Refer to GA24-3488 for forms design considerations. Printed output is not supported for optical character reading.

PREREQUISITE: 3784 Attachment (#8155) on the 3774 Communication Terminal or 3784 Attachment (#8154) on the 3651 Model 50 Retail Store Controller or 3651 Model 75 Programmable Store Controller.

Supplies: A black ribbon, IBM Part No. 1136634 or equivalent, is required

Bibliography: GC20-0001

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. NOTE: Available at time of manufacture only.

[3] Remote Power Off: #9501 ... specify this feature for capability to power down the 3774 and 3784 from the host CPU using a controlled data sequence sent over communications facilities. The 3774 must also be equipped with #9501. Not available with 3651 mdl A50, B50, A75 or B75 Attachment (#9716) or the 3651 mdl C75 or D75 Attachment (#9717).

[4] Print Belt Character Set: Specify one. Available at time of manufacture only. See Print Belt in M 10000 pages if more than one print belt is required.

- #9490 -- 48 Character Set, EBCDIC
- #9491 -- 64 Character Set, EBCDIC
- #9492 -- 94 Character Set, EBCDIC
- #9493 -- 48 Character Set, ASCII #1201 req'd on 3774
- #9494 -- 64 Character Set, ASCII #1201 req'd on 3774
- #9495 -- 94 Character Set, ASCII #1201 req'd on 3774

[5] Cabling: Fixed length cables are supplied as standard. Refer to Installation Manual - Physical Planning, GA27-3006.

[6] 3651 Retail or Programmable Controller Attachment: Specify #9716 for attachment of a 3784 mdl 1 to a 3651 mdl A50, B50, A75 or B75. Specify #9717 for attachment of a 3784 mdl 1 to a 3651 mdl C75 or D75. **Prerequisites:** The 3651 mdl 50 or mdl 75 must be equipped with #8154 and have a minimum of 48K of storage. **Note:** Remote Power Off (#9501) not available with attachment to 3651 mdl 50 or mdl 75.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3784	1	\$358	\$305	\$12,200	\$83.50

Plan Offering: Plan B Purchase Option: 40% Machine Group: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Accessories: The following items are available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 pages for additional information and field installation.

FORMS STAND (#4450) -- Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

PRINT BELT, ADDITIONAL (#5811, #5812, #5813, #5821, #5822, #5823) -- Permits the customer to obtain more than one character print belt for various applications.

- 48-char ASCII (#5811)* 48-char EBCDIC (#5821)
- 64-char ASCII (#5812)* 64-char EBCDIC (#5822)
- 94-char ASCII (#5813)* 94-char EBCDIC (#5823)

* ASCII Feature (#1201) on the 3774 is prerequisite.

**3791 CONTROLLER Models 1A, 1B, 1C, 2A, 2B**

Purpose: The IBM 3791 Controller serves as an intelligent base for clusters of operator stations attached to the 3790 Communication System. The 3791 communicates with the Host System (any virtual storage S/370 or 4300 Processor**) by local channel attachment to the byte or block multiplexer channel or the 3704/3705 Communications Controller over switched or non-switched lines utilizing Synchronous Data Link Control (SDLC). Also attaches via a Communications Adapter feature on the 4331 Processor.

- Model 1A** [No longer available] Provides 5 million bytes* of disk storage.
- Model 1B** [No longer available] Provides 10 million bytes* of disk storage.
- Model 1C** Provides 10 million bytes* of disk storage.
- Model 2A** Provides 20 million bytes* of disk storage.
- Model 2B** Provides 30 million bytes* of disk storage.

Note: Models 1A and 1B are no longer available.

Maximum: One 3791 per 3790 system.

Highlights:**3790 Communication System #9431, #9165, #9169**

When used in the 3790 Communication System, the 3791 is a programmable controller providing users with remote processing capability, disk storage data files and control of terminal clusters. Flexibility of the 3791 enables the user to efficiently configure a 3790 System for initial requirements with the ability to change system hardware and functions to meet future needs. This configuration flexibility is attained by the selection of Special Feature and Specify Feature codes.

Configuration Support #9431

When used with Configuration Support #9431, the 3791 provides for attachment of 3277 Display Station mdls 1 and 2, 3284/3286/3287 Printers and/or 3288 Line Printer mdl 2s. The 3791 Controller will permit up to a maximum of thirty-one 3277, 3284/3286/3287 and/or 3288 devices to be attached in any combination. In addition, up to a maximum of four 3793 Keyboard-Printers can be attached to the 3791 control unit giving a maximum possible total of 35 devices attached to the 3791 Controller. Up to three 3792 Auxiliary Control Units may also be attached. Higher speed print capability of up to 410 lpm is provided by the 3791 printer feature.

In addition to the Host Link attachment, the 3791 has the capability to operate independently of the host via the Batch Data Exchange feature (#9037). The 3791 Controller performs all the logic and arithmetic functions to support concurrent operation of 16 user tasks, one host communications task and two system printers. Removable diskette storage and up to 26.9* million bytes of disk storage are provided.

All 3790 programs are compiled and can be tested at the host computer prior to use at the remote locations, minimizing program development costs and helping assure uniformity of operations through the system. User-oriented application programs allow byte-by-byte and field editing, host file update, file organization option and operator sharing of 3791 programs and data sets.

Reliability, Availability and Serviceability (RAS) capabilities ensure efficient system operation by minimizing the loss of system data.

The 3790 has several features that assist in preventing unauthorized use of the system. Optional security and power-on keylocks prevent units from being made operational unless a key switch is operated. Operator-identification codes and password checking help prevent unauthorized personnel from using the system.

Configuration Support #9165

When used with this Configuration Support, the 3791 supports the functions and terminals offered by Configuration Support #9431 and provides expanded 3790 system capabilities. The additional capabilities of this Configuration Support consist of 3270 compatibility, full screen processing, RJE function, host link line speeds of up to 9600 bps subject to carrier availability, up to 31 concurrent tasks, including the System printer tasks, ASCII support, and expanded 3790 DB/DC VTAM and TCAM host support.

* Disk storage available for user program and data storage is configuration dependent. Minimum storage based on a maximum 3791 configuration is 3.9 to 26.5 million bytes for Configuration Support #9431, 3.4 to 26.0 million bytes for Configuration Support #9165, and #9431 with Expanded Index #9142, 2.4 to 25.1 million bytes for Configuration Support #9169 and Configuration Support #9165 with Configuration Conversion #9530, and #9431 with #9142 and #9350, 3.7 to 7.4 million bytes for Configuration Support #9155, 7.2 to 25.7 million bytes for Configuration Support #9175, 7.2 to 25.7 million bytes for Configuration Support #9195.

** See CICS pages in Programming for restrictions.

Configuration Support #9169

The 3790 Communication System now provides a data link adapter feature which allows communications with geographically dispersed displays and printers. When used with this Configuration Support, the 3791 supports the functions and terminals offered by Configuration Support #9431 and #9165 and provides additional 3790 system capabilities. The additional capabilities of this Configuration Support include attachment to the 3791 Controller via the Data Link Adapter of the 3276 Control Unit Display Station, 3278 Display and 3287, 3289 printers (see 3791 Data Link Adapter for models) and attachment of the 3411 Magnetic Tape Unit and Control mdl 1 and 3410 Magnetic Tape Unit mdl 1. Additional storage is also provided.

3791 Test Site Designation (#9595) for all configurations.

The purpose of #9595 is to provide the 3790 customer with the ability to designate a test site location at which he wants to install a mandatory Control Code Engineering Change. Receipt of changes at this location will occur before a new production unit can reach the customer network and before the change is distributed to other installed locations requiring the change.

#3791 Alternate Mailing Address (#9596) for Control Code Engineering Changes

The purpose of #9596 is to provide the 3790 customer with the option to have Mandatory Control Code Engineering Changes shipped to a single address, generally central site, for greater Network Management Control. The alternate address is controlled through assignment of a Teleprocessing Control Number (TPC #) or Microcode Control Number (MC #). Redistribution of the control code EC is the responsibility of the customer.

3790 Communication System/Data Entry Configuration #9155, #9175, #9195

When used in the 3790 Communication System/Data Entry Configuration, the 3791 will provide Data Entry users with editing and checking capability that results in improved data accuracy and productivity. Flexibility in configuration is attained by the selection of Configuration Support, Special Feature and Specify codes.

Configuration Support #9155

When used with Configuration Support #9155, the 3791 provides for the attachment of 3760 Dual Key Entry Station mdl 1 and mdl 2, and 3760 Key Entry Station mdl 3. The 3791 Controller will permit up to a maximum of eight 3760 mdl 1s and/or mdl 3s to be attached in any combination. Up to two 3760 mdl 2s can be attached to a 3760 mdl 1. A maximum of twelve stations equal to a maximum of twenty-four operator positions is supported if not combined with 3760 mdl 3s. For each attached 3760 mdl 3 the maximum number of operator positions is reduced by one. For combinations and limitations refer to Configuration Guidelines, GA33-4552. Supports 3791 mdls 1A, 1B and 1C. Printing at the 3791 is provided by the Line Printer (#4710) feature. Data Extraction can be done by diskette.

Configuration Support #9175

When used with Configuration Support #9175, the 3791 supports the functions and stations offered by Configuration Support #9155 and provides in addition user programmable subroutines and expanded concurrency support and the attachment of the 3411 Magnetic Tape Unit and Control mdl 1. Supports 3791 mdls 1B, 1C, 2A and 2B. For combinations and limitations see Configuration Guidelines, GA33-4562.

Configuration Support #9195 (3762 and 3760)

With Configuration Support #9195, the 3791 supports 3762 Payment Transaction Processing in addition to the functions, stations and output facilities offered by Configuration Support #9175 and the attachment of the 3411 Magnetic Tape Unit and Control mdl 1. The 3791 Controller will permit up to a maximum of eight 3762 Payment Transaction Processors and/or 3760 mdl 1 or 3 stations to be attached in any combination. A maximum of sixteen operator positions is supported if only 3762s are attached. If 3762s are mixed with 3760s a maximum of twenty-four operator positions may be supported. For combinations and limitations, see Configuration Guidelines, GA33-4572. Supports 3791 mdls 1B, 1C, 2A and 2B.

The maximum number of specific terminals attached to the 3791 with Configuration Support #9431, #9165, #9169, #9155, #9175 or #9195 is dependent upon the 3790 System. In addition, the number of attached terminals that may be operational will depend on the number of task and task mixes. The following manuals will provide additional details for system configuration.



3791 Controller Models 1A, 1B, 1C, 2A, 2B (cont'd)

*** For Configuration Support #9431, #9165, #9169

An Introduction to the IBM 3790 Communication System, GA27-2807-2

IBM 3790 Communication System Configurator, GA27-2768-7

IBM 3790 Communication System Installation Manual - Physical Planning, GA27-2769-6

For Configuration Support #9155

IBM 3790 Communication System Data Entry Configuration Introduction, GA33-4550

IBM 3790 Communication System Data Entry Configuration Guideline, GA33-4552

IBM 3790 Communication System Installation Manual Physical Planning, GA27-2769-6

IBM 3790 Communication System Data Entry Configuration Functional Description, GA33-4551.

For Configuration Support #9175

IBM 3790 Communication System/Data Entry Configuration

IBM 3760 Key Entry Station

Introduction, GA33-4560

Configuration Guidelines, GA33-4562

Functional Description, GA33-4561

IBM 3790 Communication System

Installation Manual - Physical Planning, GA27-2769

IBM 3790 Communication System/Data Entry Configuration

User Programmability Planning Guide, GC33-5903.

For Configuration Support #9195

IBM 3790 Communication System/Data Entry Configuration

IBM 3762 Payment Transaction Processor

Introduction, GA33-4570

Configuration Guidelines, GA33-4572

Functional Description, GA33-4571

IBM 3790 Communication System

Installation Manual - Physical Planning, GA27-2769

IBM 3762 Payment Transaction Processor

Paper and Printing Requirements, GA33-4576

Document Gauge, GX33-8505

IBM 3790 Communication System/Data Entry Configuration

User Programmability Planning Guide, GC33-5903

Communications Facilities: SDLC using switched point-to-point lines at speeds of up to 4800 bps, or non-switched point-to-point, or non-switched multipoint lines at speeds of up to 9600 bps via the 3704 or 3705. Also attaches via a Communications Adapter feature on the 4331 Processor. See M 2700 pages.

Host/3791 Communications:

Byte and/or Block Multiplexer Channel

1200 BPS Integrated Modem, Non-switched and Switched

IBM 3863 Modem, Non-switched and Switched

IBM 3864 Modem, Non-switched and Switched

IBM 3865 Modem, Non-switched

IBM 3872 Modem, Non-switched and Switched

IBM 3874 Modem, Non-switched and Switched

IBM 3875 Modem, Non-switched

PREREQUISITE: Direct attachment to a S/370 or 4300 Processor byte and/or block multiplexer channel with Local Channel Attachment (#1515) or remote attachment utilizing one SDLC Communications feature (#6301, #6302 or #6303) for Host system communications.

Communications with a 3704, 3705 or Communications Adapter on 4331 Processor is via a 1200 BPS Integrated Modem (#5500, #5501), or an external modem attached via the EIA Interface (#3701) feature. See M 2700 pages.

To operate a Configuration Support System (#9431, #9165 or #9169) at least one 3793 Keyboard-Printer or 3277 Display Station with Keyboard is necessary.

To operate a 3790 Communication System/Data Entry Configuration (#9155 or #9175) at least one 3760 key entry station mdl 1 or 3 is necessary. For Configuration Support #9195 at least one 3762 Payment Transaction Processor or 3760 Key Entry Station mdl 1 or 3 is necessary.

Bibliography: GC20-0370

SPECIFY: For details pertaining to specify codes, refer to Configuration Support (#9431, #9165 or #9169) Configurator, GA27-2768-7, or to 3790 Communication System/Data Entry (#9155) Configurator, GA33-4552, (#9175) Configuration Guidelines, GA33-4562, or (#9195) Configuration Guidelines, GA33-4572.

[1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Moisture proof plug - *** See complete publications list in the IBM 3790 Communication System Library Reference Summary, GX23-0205.

#9902 for 208 V or #9904 for 230 V. Locking plug - #9880 for 115 V (mdl 1A, 1B only), #9884 for 208 V, or #9886 for 230 V. Field conversion is possible between #9880 and #9884 or #9880 and #9886. No other conversions are possible.

[2] Color: Available at time of manufacture only. Specify #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Upending Kit (in the event the 3791 must be placed on end to enter installation area): #9840 is required for models 1C, 2A and 2B only.

[4] Cables: See M 10000 pages for price and ordering instructions.

[5] ASCII Support: Specify #9022 for ASCII support. ASCII support is provided for the Host Link, Diskette, 3276, 3277, 3278, 3284, 3286, 3287, 3288, 3289, 3791 Line Printers (#4710, #4711 or #4715), and Magnetic Tape Attachment (#7840). Only ASCII support type B is provided for the 3276, 3278, 3287 and 3289. Not available with Configuration Support #9431. ASCII support for #9155, #9175 and #9195 is limited to Keyboard and Displays.

[6] Print Belt Character Set: Specify for 3791 Line Printer one of the following. (These specify codes are available at time of manufacture only). The 48 character print belt is used for both EBCDIC and ASCII.

For feature codes #4710, #4711 or #4715.

	#9431	#9155	#9175	#9195	#9165	#9169
#9071 -- 48 Char Set, EBCDIC	X		X	X	X	X
#9072 -- 64 Char Set, EBCDIC	X	X	X	X	X	X
#9073 -- 96 Char Set, EBCDIC	X				X	X
#9071 -- 48 Char Set, ASCII					X	X
#9074 -- 64 Char Set, ASCII					X	X
#9075 -- 96 Char Set, ASCII					X	X

If additional print belts are required, see "Print Belts" in M 10000 pages -- Accessories.

[7] Configuration Support: The 3791 System Configuration Support must be determined before specifying the functions required and ordering special features. Field Installation: Yes. Specify one of the following:

#9431 -- for up to 16 concurrent device operations. Must be ordered for all 3791s without #9155, #9165, #9169, #9175 or #9195. Limitations: Not available with #9155, #9165, #9169, #9175 or #9195.

#9165 -- for up to 31 concurrent device operations and expanded 3790 System capabilities. Prerequisite: Additional Disk Heads (#3220 or #3221), one Control Storage Expansion (#1590) and the following Control Storage Increments: Three Type IAs (#1603), and one Type IIA (#1613). Limitation: Not available with Configuration Support #9431, #9155, #9169, #9175 or #9195.

#9169 -- for support of Data Link Adapter, 3276 Control Unit Display Station, 3278 Display Station, 3287 and 3289 printers (see 3790 Systems pages for models), Additional Storage, and attachment of the 3411 Magnetic Tape Unit and Control mdl 1 and 3410 Magnetic Tape Unit mdl 1. Prerequisites: One Additional Disk Heads (#3220 or #3221), one Control Storage Expansion Type I (#1591), six Control Storage Increment Type IA (#1603) and one Control Storage Increment Type IIA (#1613). Field Installation: Yes. Limitations: Not available with Configuration Support #9431, #9165, #9155, #9175 or #9195. Available only with machines at EC level 744565 shipped after July 1, 1976.

#9155 -- for 3790 Communication System/Data Entry Configuration. Prerequisite: Control Storage Expansion (#1590), Device Attachment Type I (#7900), Additional Disk Heads (#3220 for mdl 1A, #3221 for 1B or 1C only). Limitations: Only available with a 3791 mdl 1A, 1B or 1C. Not available with Configuration Support #9431, #9165, #9169, #9175 or #9195.

#9175 -- for 3790 Communication System/Data Entry Configuration, and the attachment of the 3411 Magnetic Tape Unit and Control mdl 1. Prerequisites: Device Attachment Type I (#7900), Additional Disk Heads (#3221 for mdls 1B, 1C, 2A and 2B), one Control Storage Expansion (#1590), and the following Control Increments: One Type IA (#1603), and three Type IIAs (#1613). Limitations: Not available with 3791 mdl 1A and with Configuration Support #9431, #9165, #9169, #9155 or #9195.

#9195 -- for 3790 Communication System/Data Entry Configuration using the 3762 Payment Transaction Processor, and the attachment of the 3411 Magnetic Tape Unit and Control mdl 1. Prerequisite: Device Attachment Type I (#7900), Additional Disk Heads (#3221 for mdls 1B, 1C, 2A and 2B), Control Storage Expansion (#1590), and the following Con-



3791 Controller Models 1A, 1B, 1C, 2A, 2B (cont'd)

Control Storage Increments: one Type IA (#1603) and three Type IIAs (#1613). *Limitations:* Not available with 3791 mdl 1A and with Configuration Support #9431, #9155, #9165, #9169 or #9175.

[8] Configuration: For each 3790 System Configuration Support (#9431, #9155, #9165, #9169, #9175 or #9195), the 3791 must be conditioned to support the function being provided and the terminals attached. Future modifications to a 3790 System must be specified by changes to the configuration features for the 3791.

IBM 3790 Communication System (#9431, #9165 or #9169)

The selection of the following function and attachment specify codes is required to complete the 3791 Configuration order. *Field Installation:* Yes. *Limitation:* Not available with Configuration Support #9155, #9175 and #9195. Purchase customers must submit an RPQ for field conversion from #9431 or #9165 to #9169.

Device/Facility

3791 Controller

- 3792 Attachment **9110** First 3792
9120 Second 3792
9130 Third 3792
Prerequisite: #9431, #9165 or #9169.
- 3793 Attachment **9011** Specify total number of 3793s attached by ordering quantity. *Maximum:* 4 with #9431 ... 3 with #9165 or #9169. *Prerequisite:* #9431, #9165 or #9169
- 3277, 3284, 3286, 3287, 3288 Attachment **9200** Specify total number of devices attached by ordering quantity. *Maximum:* 31. *Prerequisite:* #9431, #9165 or #9169.
- 9250** Specify for any attached model 2 device. *Maximum:* 1 *Prerequisite:* #9431 or #9165.

3792 Auxiliary Control Unit

Prerequisite: #9431, #9165 or #9169.

Maximum Per 3792	First 3792		Second 3792		Third 3792	
	2741	3793	2741	3793	2741	3793
Two	9115		9125		9135	
Four		9111		9121		9131
One		9119		9129		9139

Specify the above codes by ordering quantity. Order once for each unit attached. *NOTE:* Only one 3792 line printer feature may be attached to a 3790 System. The one printer can be attached to any one of the 3792 Auxiliary Controllers. See "Limitations" in 3792 Machines pages for details.

Support Functions - #9431 and #9165

Configuration Support #9165 provides all the functions of Configuration Support #9431. Some of the functions may not require ordering for Configuration Support #9165. Prerequisites will determine requirements for #9431 or #9165.

Functions	Specify#	Comment
Line Printer	9561	132 print positions. <i>Prerequisite:</i> #9431 or #9165.
	9562	96 character print belt. <i>Prerequisite:</i> #9431.
Print Data Set (specify one)	9421	1024 Records
	9422	2048 Records
	9423	4096 Records
	9424	8192 Records <i>Prerequisite:</i> #9431 or #9165.
Transaction Data Set (specify one)	9771	1024 Records
	9772	2048 Records
	9773	4096 Records
	9774	8192 Records <i>Prerequisite:</i> #9431 or #9165.
Control Storage Configuration	9531	Control Storage Configuration 1
	9532	Control Storage Configuration 2
	9533	Control Storage Configuration 3 <i>Prerequisite:</i> #9431.
Additional 3790 Functions	9430	Optional, order only if required. <i>Prerequisite:</i> #9431.
Expanded Program Index	9142	Optional, order only if required. <i>Prerequisite:</i> #9431 and #9430. See Note 1.

- Batch Data Exchange via Diskette** **9037** Optional, order only if required. *Prerequisite:* One #9431 or #9165 and #6301, #6302, #6303 or #1515.
- Configuration Conversion** **9350** Optional, order only if required. *Prerequisites:* #9431 and #9142, #9430, #9424 and #9774 or #9165 and #9424 and #9774. See Note 2.

Note 1: Machines shipped prior to July 1, 1976 and not at Factory EC level 744209 or higher cannot take advantage of the installation assist function of Specify Feature #9142. Configuration Support #9165 can be field installed on these machines but requires reinstall of the data base. See Field Installation of Special Features #3220 and #3221.

Note 2: Machines shipped prior to July 1, 1976 and not at Factory EC level 744565 or higher cannot install Specify Feature #9350 on Configuration Support #9169. Models 2A and 2B with serial numbers 20113 through 20196, excluding numbers 20165, 20190 and 20194, must have Field EC 746445 installed with Configuration conversion #9350 on second and third position disk storage files to avoid reinstall later for feature #3221 on these files.

- User Data Set** **9501** For first add'l 16 user Data Sets. *Maximum:* 1. *Prerequisite:* #9431 or #9165.
- 9502** For second add'l 16 user Data Sets. *Maximum:* 1. *Prerequisite:* #9431 or #9165.
- User Sessions** **9344** Optional number of 31 available. When specified, *Minimum:* 1. *Maximum:* 16 with #9431 ... 31 with #9165. *Prerequisite:* #9431 or #9165.
- System Activity** **9149** Specify to define concurrent device activity. *Minimum:* 1. *Maximum:* 31. *Prerequisite:* #9165.
- 9150** Specify #9150 once for each device that is operational when host is active. *Prerequisite:* #9431.
- 9151** Specify #9151 once for each additional device that is operational when host is inactive. *Prerequisite:* 9431.
- RJE Function** **9541** Specify only if required. *Prerequisite:* #9165.
- 9542** RJE Console. One required. *Prerequisite:* #9541.
- 9543** Specify if RJE Reader is required. *Prerequisite:* #9541. *Maximum:* 1.
- 9544** Specify if RJE Writer is required. *Maximum:* 1. *Prerequisite:* #9541.
- 9545** Line Printer. *Maximum:* 2. *Prerequisite:* #9541.
- 9546** RJE Logical Unit. *Minimum:* 1. *Maximum:* 5. *Prerequisite:* #9541.
- Test Site** **9595** To designate a 3791 location as a test site for Mandatory Control Code Engineering Changes.
- Alternate Mailing Address** **9596** To designate that an alternate mailing address is available for control code engineering changes.

Support Functions - #9169

Configuration Support #9169 provides all the functions of Configuration Support #9431 and #9165. Only the following functions require ordering for Configuration Support #9169.

Function	Specify#	Comment
Line Printer	9561	132 print positions. <i>Prerequisite:</i> #9169.
System Activity	9149	Specify to define concurrent device activity. <i>Minimum:</i> 1 <i>Maximum:</i> 31 <i>Prerequisite:</i> #9169.
Batch Data Exchange via Diskette/Tape	9037	Optional, order only if required. <i>Prerequisites:</i> #9169 and #6301, #6302, #6303 or #1515.



3791 Contoller Models 1A, 1B, 1C, 2A, 2B (cont'd)

- RJE Function 9541** Specify only if required. *Prerequisite:* #9169.
- Test Site 9595** To designate a 3791 location as a test site for mandatory control code engineering changes.
- Alternate Mailing Address 9596** To designate that an alternate mailing address is available for control code engineering changes.
- Additional User Sessions 9345** Optional, order only if required. Provides 15 additional user sessions Basic system provides 16 user sessions. *Prerequisite:* #9169.

IBM 3790 Communication System/Data Entry Configuration (#9155, #9175 or #9195)

The selection of the following function and attachment specify codes is required to complete the 3791 configuration. The prerequisite for each specify code will indicate the availability of that capability with the selected Configuration Support (#9155, #9175, #9195). *Field Installation:* Yes. *Limitation:* Not available with Configuration Support #9431, #9165 or #9169. *Prerequisite:* Configuration Support #9155, #9175 or #9195.

- | Function | Specify# | Comment |
|-------------------------------|-------------|---|
| Concurrency | 9060 | Specify if 1 thru 9, 3760 Stations are active during data transmission to or from the host. Concurrency is not supported with 10 to 12 3760s active during data transmission to or from the host. <i>Field Installation:</i> Yes. <i>Prerequisite:</i> #9155. |
| 1 thru 6 stations | 9156 | Specify if 6 is maximum number of stations planned for attachment. <i>Field Installation:</i> Yes. <i>Prerequisite:</i> #9155, #9175 or #9195. |
| 1 thru 9 stations | 9157 | Specify if 9 is maximum number of stations planned for attachment. <i>Field Installation:</i> Yes. <i>Prerequisite:</i> #9155, #9175 or #9195. |
| 1 thru 12 stations | 9158 | Specify if 12 is maximum number of stations planned for attachment. <i>Field Installation:</i> Yes. <i>Prerequisite:</i> #9155, #9175 or #9195. |
| User programmable subroutines | 9850 | Specify only if required. <i>Prerequisite:</i> #9175 or #9195 and #7500. |
| Line Printer | 9561 | 132 print positions. <i>Prerequisite:</i> #9175 or #9195. |
| Test Site | 9595 | To designate a 3791 location as a test site for mandatory control code engineering changes. |
| Alternate Mailing Address | 9596 | To designate that an alternate mailing address is available for control code engineering changes. |

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3791	1A	\$ 541	\$ 460	\$18,700	\$167
	1B	541	460	18,700	178
	1C	541	460	18,700	204
	2A	717	610	24,800	194
	2B	893	760	30,900	248

Plan Offering: Plan B Warranty: B Machine Group: D
Purchase Option: 55% Useful Life Category: 2 Per Call: 1
Termination Chg Mnths: 5 Termination Chg Percent: 25%
Upper Limit Percent: 0%

Note: Models 1A and 1B are no longer available.

Model Changes: Model 1A can be changed to Model 1B. This upgrade requires replacement of disk storage. Adequate provision must be made for retaining data contained on disk storage and elimination of user proprietary information. **Limitation:** A model change from mdl 1A to mdl 1B for purchase customers requires submission of an RPQ. Model 2A can be changed to model 2B. Model 1C can be changed to model 2A or 2B. No other changes are possible.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

Field conversion charge for Model 1A to Model 1B is by RPQ

Field conversion charge for Model 2A to Model 2B is \$6,100.

Field conversion charge for Model 1C to Model 2A is \$6,100 ... from Model 1C to Model 2B is \$12,200.

*** Customer price quotations and customer order acknowledgement letters for purchase must state: Installation of the model change involves the removal of parts which become the property of IBM.

SPECIAL FEATURES

LOCAL CHANNEL ATTACHMENT (#1515). Provides for direct attachment to S/370 mdls 115**, 125, 135, 135-3, 138, 145, 145-3, 148, 155 II, 158, 158MP, 158AP, 3031, 3032, 3033 or 4300 Processor via an integrated byte and/or block multiplexer channel and mdls 165 II, 168, 168MP, 168AP via 2870 byte multiplexer channel and 2880 Block Multiplexer Channel. Maximum distance from the channel is 200 feet. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Cannot be installed with SDLC Communications feature (#6301, #6302 or #6303). Not available on the Block Multiplexer Channel with Configuration Support #9431.

ADDITIONAL DISK HEADS (#3220, 3221). [#3220 for Mdl 1A ... #3221 for Mdls 1B, 1C, 2A, 2B] Provides additional disk heads necessary for use with Configuration Support #9155, #9165, #9169, #9175 or #9195. **Maximum:** One for #9155 and #9165 ... three for #9169, #9175 and #9195. **Field Installation:** Yes ... machines shipped prior to July 1, 1976 and not at EC level 744209 require the removal of disk storage. Mdls 2A and 2B with serial numbers 20113 thru 20196, excluding numbers 20165, 20190 and 20194, at factory EC level 744209 require removal of disk storage in the second and third positions to field install #3221. See chart below to verify replacement requirement of each disk storage (enclosure).

	Mdl 1A	Mdl 1B, 1C, 2A, 2B
*Label color on each disk storage (enclosure) indicates replacement necessary for additional heads.	White	Orange
Label color on each disk storage (enclosure) indicates additional heads installable without replacement of enclosure.	Pink	Blue

* Adequate provision must be made for retaining data contained on all disk storage in machine and elimination of user proprietary information. All replaced parts become the property of IBM.

Limitations: One is required on a mdl 1A, 1B or 1C for Configuration Support #9155. One is required on a mdl 1A, 1B, 1C, 2A or 2B for Configuration Support #9165 or #9169. With Configuration Support #9175 and #9195 one is required on a mdl 1B or 1C, two are required on a mdl 2A, and three are required on a mdl 2B. Not available with #9431. **Prerequisite:** Configuration Support #9155, #9165, #9169, #9175 or #9195.

LINE PRINTER - 80 PRINT POSITIONS 155 LPM (#4710). Provides a line printer with maximum speeds of 155 LPM with 48 character set, 120 LPM with 64 character set and 80 LPM with 96 character set. Included as standard is one operator interchangeable print belt (48, 64 or 96 character set). ASCII or EBCDIC character set must be specified. Capability to print on continuous fan fold paper up to 80 print positions on an 8-inch (20 cm) print line with line spacing of 6 lines per inch (2.54 cm). Paper up to six parts plus carbon (maximum total thickness is .020 inches or .50 mm) can be accommodated. Maximum paper width is 15" overall. Refer to form design reference guide for printers (GA24-3488) for form design considerations. Card stock is not recommended. A form jam detection capability is provided. Order IBM Part No. 1136634 or equivalent, for replacement ribbons. **Maximum:** One. **Limitations:** Line printers on the 3791 and 3792 must have the same number print positions. The 48, 96 and ASCII character sets are not available with Configuration Support #9155. The 96 and ASCII character sets are not available with Configuration Support #9175 or #9195. With Configuration Support #9155 the Line Printer (#4710) can be used during data transmission between the 3791 and the host when the system is configured for concurrency. **Field Installation:** Yes. **Specify:** See "Print Belt Character Set" under Specify for ordering 48, 64 or 96 character sets.

LINE PRINTER - 132 PRINT POSITIONS 155 LPM (#4711). Provides a line printer with maximum speeds of 155 LPM with 48 character set, 120 LPM with 64 character set and 80 LPM with 96 character set. Included as standard is one operator interchangeable print belt (48, 64 or 96 character set). ASCII or EBCDIC character set must be specified. Capability to print on continuous fan fold paper up to 132 print positions on a 13.2-inch (33.5 cm) print line with line spacing of 6 lines per inch (2.54 cm). Paper up to six parts plus carbon (maximum total thickness is .020 inches or .50 mm) can be accommodated. Refer to form design reference guide for printers (GA24-3488) for form design considerations.



3791 Contoller Models 1A, 1B, 1C, 2A, 2B (cont'd)

Card stock is not recommended. A form jam detection capability is provided. Order IBM Part No. 1136634 or equivalent, for replacement ribbons. **Maximum:** One. **Field Installation:** Yes. **Specify:** See "Print Belt Character Set" under Specify for ordering 48, 64 or 96 character sets. **Limitations:** Line printers on the 3791 and 3792 must have the same number print positions. Not available with Configuration Support #9155. The 96 and ASCII character sets are not available with Configuration Support #9175 or #9195.

LINE PRINTER - 132 PRINT POSITIONS 410 LPM (#4715). Provides a higher speed line printer with maximum speeds of 410 LPM with 48 character set, 300 LPM with 64 character set, and 230 LPM with 96 character set. Included as standard is one operator interchangeable print belt (48, 64 or 96 character set) and a forms stand which is an integral part of this feature. ASCII or EBCDIC character set must be specified. Capability to print on continuous fan fold paper up to 132 print positions on a 13.2-inch (33.5 cm) print line. Line density is 6 lines per inch with #9431. With Configuration Support #9165 or #9169, 6 or 8 lines per inch density is available and is program selected. Paper up to six parts plus carbon (maximum total thickness is .020 inches or .50 mm) can be accomodated. Refer to form design reference guide for printers (GA24-3488) for forms design considerations. Card stock is not recommended. A form jam detection capability is provided. Order IBM Part No. 1136670 or equivalent, or special application ribbon, Part No. 1299610, or equivalent, for replacement ribbons. **Maximum, One.** **Limitations:** Line printer on the 3792 must have 132 print positions (#4713). Not available with Configuration Support #9155. The 96 and ASCII character sets are not available with Configuration Support #9175 or #9195. **Field Installation:** Yes. **Specify:** See "Print Belt Character Set" under Specify for ordering 48, 64 or 96 character sets.

MAGNETIC TAPE ATTACHMENT (#7840). Provides for the attachment of the 3411 Magnetic Tape Unit and Control mdl 1. Additional tape capacity is provided by attachment of the 3410 Magnetic Tape Unit mdl 1 via the 3411. The total number of tape units (3411 and 3410) on a 3791 Contoller is four. **Maximum: One.** **Field Installation:** Yes. **Prerequisites:** 3790 System Attachment (#7003), Single Density (#3211) or Dual Density (#3221) on the 3411 and 3791 Configuration Support #9169, #9175 or #9195 on the 3791. **Restrictions:** Not available with Configuration Support #9155, #9165 or #9431. **Limitations:** Configuration Support #9175 and #9195 do not support attachment of the 3410 mdl 1 tape unit. Only the 3411 Single Density feature (#3211) and Dual Density feature (#3221) are supported by the 3791 Contoller.

DEVICE ATTACHMENT TYPE I (#7900). Allows attachment of up to three 3792 Auxiliary Control Units or four 3760 Dual Key Entry Station mdl 1s or four 3760 Key Entry Station mdl 3s or four 3762 Payment Transaction Processors or any combination of four of these stations at a distance of 2000 feet. Each 3760 mdl 1 can attach up to two 3760 mdl 2s. **Maximum: One.** **Field Installation:** Yes. **Limitations:** All attached units must be the same machine type except for #9195 which allows mixing of 3760 and 3762 units. **Prerequisite:** Configuration Support (#9155, #9175 or #9195) for 3760 attachment or (#9195) for 3760 and 3762 attachment or (#9431, #9165 or #9169) for 3792 attachment.

DEVICE ATTACHMENT TYPE I, ADDITIONAL (#7922). Attaches up to four 3760 Dual Key Entry Station mdl 1s or four 3760 Key Entry Station mdl 3s or four 3762 Payment Transaction Processors or any combination of four of these stations at a distance of 2000 feet. Each 3760 mdl 1 can attach up to two 3760 mdl 2s. **Maximum: One.** **Field Installation:** Yes. **Limitation:** A maximum of twenty-four operator positions is supported for attachment to a 3791 Contoller. **Prerequisites:** Configuration Support (#9155, #9175 or #9195) and Device Attachment Type I (#7900). Not available with Configuration Support #9431, #9165 or #9169.

3793 ATTACHMENT (#7901). To attach one 3793 Keyboard-Printer to the 3791 ... see 3793 for details. **Maximum:** Four per 3791 mdls 1C, 2A and 2B ... one per 3791 mdls 1A and 1B. Models 1A and 1B require 3793 Attachment - Second (#7902) for a second 3793 and 3793 Attachment, Add'l (#7903) for a third or fourth ... maximum of two with Magnetic Tape Attachment (#7840). **Field Installation:** Yes. **Limitations:** Cannot be installed with Configuration Support #9155, #9175 or #9195. For Configuration Support #9165 the maximum is three. For Configuration Support #9431 the maximum is three when Control Storage Increment Type II (#1612) or Type IIA (#1613) is installed. For Configuration Support #9169 the maximum is three, however, if Control Storage Increment Type II (#1612) or more than one Type IIA (#1613) is installed the maximum is one.

3793 ATTACHMENT - SECOND (#7902). [Mdl 1A or 1B only] To attach a second 3793 to a 3791 mdl 1A or 1B. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Not available with Configuration Support #9169 when Control Storage Increment Type II (#1612) or more than one Control Storage Increment Type IIA

(#1613) is installed. **Prerequisite:** 3793 Attachment (#7901).

3793 ATTACHMENT, ADD'L (#7903). [Mdl 1A or 1B only] To attach a third or fourth 3793 to a 3791 mdl 1A or 1B. **Maximum:** Two. **Field Installation:** Yes. **Prerequisite:** 3793 Attachment - Second (#7902). **Limitations:** If Control Storage Increment Type II (#1612), or Type IIA (#1613) is installed, only three 3793s can be attached with Configuration Support #9431. For #9165 or #9169, the maximum is three 3793s. Not available with Magnetic Tape Attachment (#7840).

DEVICE ATTACHMENT TYPE II (#7911). Allows attachment of up to any combination of four 3277s, 3284s, 3286s, 3287s and/or 3288s to the 3791. For Display and Printer features supported by the 3790 System, see 3790 Communication Configurator, GA27-2768 and Introduction to the 3790 System for details. **Maximum:** One per 3791. **Field Installation:** Yes. **Limitation:** Not available with Configuration Support #9155, #9175 or #9195.

DEVICE ATTACHMENT TYPE II, ADD'L (#7912). Each feature allows attachment of up to any combination of four additional 3277s, 3284s, 3286s, 3287s and/or 3288s to the 3791. **Maximum:** Seven, but restricted to a maximum of 31 devices. **Field Installation:** Yes. **Limitation:** If printer feature #4710, #4711 or #4715 is attached, maximum number of 3277, 3284, 3286, 3287 and/or 3288 devices is restricted to thirty. If a 3792 is attached, maximum is six, with a maximum of 28 devices. The attachment of a line printer feature does not reduce the maximum of 28 devices. **Prerequisite:** Device Attachment Type II (#7911).

CONTROL STORAGE FEATURES

The amount of control storage to be ordered for the "3790 Communication System" (#9431 or #9169) depends on both the quantity and type of attachments in the system configuration. See "3790 Communication System Configurator" GA27-2768-6 to determine the correct ordering quantities of control storage.

The amount of control storage for the "3790 Communication System/Data Entry Configuration" (#9155) is dependent upon the number of 3760 Stations attached to the 3791 and whether they are inactive or active during data transmission to or from the host. Non-concurrency is the condition when all 3760s are inactive during data transmission. Concurrency is the condition when up to nine 3760s are active during data transmission. Select from Table I or II below, the required Control Storage Increments.

Table I - No Concurrency

Max. Attached 3760s	Type I	Type IA	Type II	Type IIA
6	--	--	1	--
9	1	--	1	--
12	--	1	1	--

Table II - Concurrency

Max. Attached 3760s	Type I	Type IA	Type II	Type IIA
6	1	--	--	1
9	--	1	--	1
12***	--	1	1	1

*** A maximum of nine 3760s can be active.

The amount of control storage to be ordered for the "3790 Communication System/Data Entry Configuration" (#9175 or #9195) is defined by the prerequisite for Configuration Support #9175 or #9195.

CONTROL STORAGE EXPANSION (#1590). Provides capability of expanding control storage. **Maximum: One.** **Field Installation:** Yes. **Prerequisite:** Configuration Support #9431, #9155, #9165, #9175 or #9195. **Limitation:** #1590 required for Configuration Support #9155, #9165, #9175 or #9195. Not available with #9169.

CONTROL STORAGE EXPANSION - TYPE I (#1591). Provides the capability of expanding control storage. **Maximum: One.** **Field Installation:** Limited to those machines shipped after July 1, 1976 and at Factory EC Level 744565 or higher. **Prerequisite:** Configuration Support #9169. **Limitations:** Cannot be installed with Control Storage Expansion (#1590). Purchase customers must submit an RPQ for a field change from Control Storage Expansion (#1590).

CONTROL STORAGE INCREMENT - TYPE I (#1602). Provides 8,192 positions of additional control storage. **Maximum:** One for #9431, #9155 and #9169. **Field Installation:** Yes. **Prerequisite:** Control Storage Expansion #1590 for Configuration Support #9431 or #9155. Control Storage Expansion Type I (#1591) for Configuration Support #9169. **Limitations:** Not available with Configuration Support #9165, #9175 or #9195. See Note below.

CONTROL STORAGE INCREMENT - TYPE IA (#1603). Provides 16,384 positions of additional control storage. **Maximum:** Three for #9431 or #9165, one for #9155, #9175 or #9195, seven for #9169. **Field Installation:** Yes. **Prerequisite:** Control Storage

**3791 Controller Models 1A, 1B, 1C, 2A, 2B (cont'd)**

Expansion (#1590) for Configuration Support #9431, #9155, #9165, #9175 or #9195. Or Control Storage Expansion Type I (#1591) for Configuration Support #9169. **Limitation:** Three #1603s are required for Configuration Support #9165, six (#1603s) are required for Configuration Support #9169 and one is required for #9175 or #9195.

CONTROL STORAGE INCREMENT - TYPE II (#1612). Provides 8,192 positions of additional control storage. **Maximum:** One for #9431, #9155 and #9169. **Field Installation:** Yes. **Prerequisite:** Control Storage Expansion (#1590) for Configuration Support #9431 or #9155. Control Storage Expansion Type I (#1591) for Configuration Support #9169. **Limitation:** Not available with Configuration Support #9165, #9175 or #9195. See Note below.

CONTROL STORAGE INCREMENT - TYPE IIA (#1613). Provides 16,384 positions of additional control storage. **Maximum:** One for #9155, #9165 and #9431, five for #9169, three for #9175 and #9195. **Field Installation:** Yes. **Prerequisite:** Control Storage Expansion (#1590) for Configuration Support #9431, #9155, #9165, #9175 or #9195. Or Control Storage Expansion Type I (#1591) for Configuration Support #9169. **Limitation:** One #1613 is required for Configuration Support #9165 and #9169. Three are required for #9175 or #9195. See 3793 Attachment features (#7901, #7902, #7903) for additional restrictions.

NOTE: Customers who elect to purchase Storage Increment Type I or Type II and plan to order additional storage at a later date, should consider purchase of Storage Increment Type IA or Type IIA initially because some field upgrades of storage may require replacement of initial feature and installation of new feature.

COMMUNICATIONS FEATURES

EIA INTERFACE (#3701). Provides EIA interface for attachment of an IBM or other external modem. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with #5500 or #5501. **Prerequisite:** SDLC Communications Feature with or without Business Machine Clock (#6301, #6302 or #6303).

1200 BPS INTEGRATED MODEM - NON-SWITCHED (#5500). Provides an integrated modem for communications with the host system over non-switched lines. No external modem is required. **Specify:** #9651 for 4-wire strapping, or #9652 for 2-wire strapping. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with #3701, #5501, #6302 or #6303. **Prerequisite:** SDLC Communications Feature with Business Machine Clock (#6301).

1200 BPS INTEGRATED MODEM - SWITCHED (#5501). Provides an integrated modem with answering capability for communications from the host system over switched lines via a Telephone Company supplied Data Access Arrangement Type CBS, DAA or FCC, or equivalent. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Cannot be installed with #3701, #5500, #6302 or #6303. **Prerequisite:** SDLC Communications Feature with Business Machine Clock (#6301).

SDLC COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCK (#6301). Required for attachment to communications lines through the 1200 BPS Integrated Modem (#5500, #5501) or, via an EIA Interface (#3701) at 1200 bps, to any external modem which does not provide its own clocking. **Maximum:** One. **Limitation:** Cannot be installed with #1515, #6302 or #6303. **Field Installation:** Yes.

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCK (#6302). Required for attachment to communications lines via an EIA Interface (#3701) and external modem which provides its own clocking up to 2400 bps with #9431 or #9165, and up to 4800 bps with #9155, #9175 or #9195. **Maximum:** One. **Limitation:** Cannot be installed with #1515, #5500, #5501, #6301 or #6303. With Configuration Support #9155, #9175 and #9195, up to six stations may be active concurrently with communications between 3791 and the host. **Field Installation:** Yes.

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCK (#6303). Required for attachment to communications lines via an EIA Interface (#3701) and external modem which provides its own clocking of up to 9600 bps. **Maximum:** One. **Limitations:** Cannot be installed with #1515, #5500, #5501, #6301, #6302 or Configuration Support #9431, #9155, #9175 or #9195. **Field Installation:** Yes.

DATA LINK ADAPTER

The Data Link Adapter provides the capability for the 3791 Controller to attach via non-switched communication lines the 3276 Control Unit Display Station mdls 2, 3, 4, 12, 13 and 14, with the appropriate 3278 Display Station mdl 2, 3 or 4, 3287 mdl 1 or 2 printers or 3289 mdl 1 or 2 line printers. The 3791 Controller supports only SDLC communication and the 1920 character format on the Data Link Adapter. 3276 mdls 2, 3 and 4 attached to a 3791 require the SDLC/BSC Switch (#6315) to be in the SDLC position. 3276 mdls 3, 4, 13 and 14 and 3278 mdls 3 and 4

require the character mode to be 1920 characters. The 3791 Controller Communication Link is provided by selection of the EIA/CCITT Interface (#3703) with the Data Link Adapter (#3210 or #3211) at speeds of up to 9600 bps or the Integrated Modem (#4781) with the Data Link Adapter (#3210) at speeds of 1200 bps. See M 2700 pages for available communications facilities.

The maximum number of Data Link Adapter features (#3210 and/or #3211) attached to a 3791 Controller is five. The maximum number of 3276 control units that can be attached to each Data Link Adapter is five to a 3791 Controller. The 3790 will allow the attachment of a total of 80 units and devices in any combination on the five Data Link Adapters. See 3270 pages for restrictions.

3791 TERMINAL COMMUNICATIONS

1200 bps Integrated Modem - Non-switched*
IBM 3863 Modem
IBM 3864 Modem
IBM 3865 Modem
IBM 3872 Modem**
IBM 3874 Modem**

* Half speed or 600 bps is not attainable.

** If Switched Network Back-up, switching is done manually.

DATA LINK ADAPTER WITH BUSINESS MACHINE CLOCK (#3210). Required for attachment to data link through the 1200 bps Integrated Modem (#4781) or via an EIA/CCITT Interface (#3703) at 1200 bps, to any external modem which does not provide its own clocking. Half speed or 600 bps is not attainable with this feature. **Maximum:** Five. The maximum is reduced by one for each #3211 attached. **Field Installation:** Yes. **Limitations:** All 3276s and 3278s must have keyboards. Cannot be installed with Configuration Support #9155, #9165, #9431, #9175 or #9195. **Prerequisite:** Configuration Support #9169.

DATA LINK ADAPTER WITHOUT BUSINESS MACHINE CLOCK (#3211). Required for attachment to data link via an EIA/CCITT interface (#3703) and external modem which provides its own clocking of up to 9600 bps. **Maximum:** Five. The maximum is reduced by one for each #3210 attached. **Field Installation:** Yes. **Limitation:** Cannot be installed with Configuration Support #9155, #9165, #9431, #9175 or #9195. **Prerequisite:** Configuration Support #9169.

EIA/CCITT INTERFACE (#3703). Provides EIA/CITT interface for attachment of an IBM or other external modem. **Maximum:** Five. **Field Installation:** Yes. **Prerequisite:** Data Link Adapter #3210 or #3211.

1200 BPS INTEGRATED MODEM - NON-SWITCHED (#4781). Provides an integrated modem for communications from the Data Link Adapter over non-switched lines. No external modem is required. **Specify:** Unless otherwise specified, 4-wire strapping will be provided. **Specify #9654** for 2-wire strapping. **Maximum:** Five. **Field Installation:** Yes. **Prerequisite:** Data Link Adapter (#3210).

SECURITY KEYLOCK (#6350). Allows the 3791 to be powered-on only with key. Removing the key does not turn power off. For additional or replacement keys, see M 10000 pages. **Maximum:** One. **Field Installation:** Yes.



3791 Controller Models 1A, 1B, 1C, 2A, 2B (cont'd)

Special Feature Prices:		MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Local Channel Attach	#1515	\$ 88	\$ 75	\$3,000	\$4.00
Control Storage Expan	1590	31	26	1,055	5.50
Cntrl Storage Exp Type I	1591	31	26	1,055	5.50
Control Storage Increment					
Type I	1602	32	27	637	5.00
Type IA	1603	58	49	1,170	10.00
Type II	1612	32	27	637	5.00
Type IIA	1613	58	49	1,170	10.00
Data Link Adapter					
w Bus Mach Clock	3210	41	35	1,400	11.00
w/o Bus Mach Clock	3211	35	30	1,200	10.50
Add'l Disk Heads					
- mdl 1A	3220††	32	27	1,080**	17.00
- mdls 1B, 1C, 2A, 2B	3221††	32	27	1,080**	17.00
EIA Interface	3701	12	10	400	4.00
EIA/CCITT Interface					
Data Link	3703	12	10	400	4.00
Line Printer 155 LPM					
80 Print Positions	4710	177	151	6,175†	56.00
132 Print Positions	4711	199	169	6,825†	59.50
Line Printer 410 LPM					
132 Print Positions	4715	351	299	11,960	114.00
1200 bps Integrated Modem -					
Non-switch (Data Link)	4781	25	21	840	7.00
Non-switched	5500	19	16	630	5.00
Switched	5501	25	21	860	7.00
SDLC Communications Feature					
w Bus Machines Clock	6301	19	16	670	3.00
w/o Bus Mach Clock	6302	12	10	450	2.50
w/o Bus Mach Clock	6303	35	30	1,200	10.50
Security Keylock	6350	35	SUC -	35	NC
Magnetic Tape Attach	7840	182	155	6,200	8.00
Device Attach Type I	7900	36	31	1,300	4.00
Dev Attach Type I, Add'l	7922	24	20	800	.50
3793 Attachment	7901	36	31	1,300	3.00
3793 Attachment - 2nd	7902	36	31	1,300	3.00
3793 Attachment, Add'l	7903	36	31	1,300	3.00
Device Attach Type II	7911	38	32	1,300	5.00
Dev Attach, Add'l Type II	7912	32	27	1,100	3.00

** Feature prices are based on plant installation. Purchase customers should be advised that field installation of these features requires the submission of an RPQ for model 1As or 1Bs shipped prior to 7/76 and model 2As or 2Bs shipped prior to 10/76.

† Customers who may elect to purchase #4710/#4711 and later upgrade to #4715 should consider the purchase of #4715 initially rather than #4710/#4711.

†† Customer price quotations and customer acknowledgement letters for purchase for model 1As or 1Bs shipped prior to 7/76 and model 2As or 2Bs shipped prior to 10/76 must state: "Installation of this feature involves removal of parts which become the property of IBM."

ACCESSORIES: The following items are available on a purchase basis only. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND (#4450) - [For feature codes #4710 and #4711 only] Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing. The forms stand for feature code #4715 is an integral part of the feature.

PRINT BELT, ADD'L - Permits the customer to obtain more than one character set print belt for various applications.

155 LPM Max

48-character EBCDIC/ASCII (#5821)

64-character EBCDIC (#5822)

94-character EBCDIC (#5823)

64-character ASCII (#5812)

94-character ASCII (#5813)

410 LPM Max

48-character EBCDIC/ASCII (#5825)

64-character EBCDIC (#5826)

94-character EBCDIC (#5827)

64-character ASCII (#5816)

94-character ASCII (#5817)



IBM 3791 CONTROLLER Models 11C, 12A, 12B

Purpose: The 3791 Controller, models 11C, 12A or 12B, serves as an intelligent base for clusters of operator stations attached to the 3730 Distributed Office Communication System.

Model 11C Provides 10 million bytes* of disk storage

Model 12A Provides 20 million bytes* of disk storage

Model 12B Provides 30 million bytes* of disk storage

* The minimum disk storage available for data storage and user programs (based on a maximum 3791 configuration) is: Model 11C -- 5.5 million bytes ... Model 12A -- 14.8 million bytes ... Model 12B -- 24.1 million bytes.

Maximum: One 3791 per 3730 system.

Highlights: The 3791 Controller mdl 11C, 12A or 12B, with Configuration Support #9171 installed, serves as the controller for the 3730 Distributed Office Communication System to support the 3730 functions of document creation, editing, storage, retrieval, formatting, printing, archiving, and (with #9275) automated text.

Additional controller features and facilities include:

- Non-removable disk storage for customer use
- Line printer feature
- Host system attachment (with #9285) through an SDLC communications feature, or through a local channel attachment feature.

Communication Facilities: Direct attachment to S/370, 4300, or 3031, 3032, or 3033 processor byte and/or block multiplexer channel using Local Channel Attachment (#1515).

Synchronous Data Link Control (SDLC) using switched point-to-point lines at speeds of up to 2400 bps, or non-switched point-to-point, or non-switched multipoint lines at speeds of up to 9600 bps subject to carrier availability via the 3704 or 3705. See M 2700 pages.

For the 3791-to-3704/3705 SDLC link, IBM offers a 1200 bps integrated modem or an EIA feature for the attachment of external modems.

Note: For communication capabilities and modem attachment data, see 3863, 3864, 3865, 3872, 3874, 3875 and M 2700 pages.

Host/3791 Communication

- Byte and/or block multiplexer channel
- 1200 bps Integrated Modem, Non-switched
- 1200 bps Integrated Modem, Switched
- 3863 Modem, Non-switched (2400 bps)
- 3863 Modem, Switched (2400 bps)
- 3872 Modem, Non-switched (2400 bps)
- 3872 Modem, Switched (2400 bps)
- 3864 Modem, Non-switched (4800 bps)
- 3864 Modem, Switched (4800 bps)
- 3874 Modem, Switched (4800 bps)
- 3875 Modem, Non-switched (7200 bps)
- 3865 Modem, Non-switched (9600 bps)

PREREQUISITES: Local Channel Attachment feature (#1515), or one SDLC Communication Feature (#6301, 6302 or 6303) is required for CE maintenance purposes.

To operate on 3730 system, at least one 3732 Text Display Station with keyboard, and either a 3736 Printer or a 3791 Line Printer feature is required.

Test Site Designation (#9595) The purpose of #9595 is to provide the 3730 customer with the ability to designate a test site location at which to install a Mandatory Microcode Engineering Change. Receipt of changes at this location will occur before a new production unit can reach the customer network and before the change is distributed to other installed locations requiring the change. This feature should be limited to one per network.

3791 Alternate Mailing Address (#9596) for Microcode Updates #9596 provides the 3730 customer with the option of having Mandatory Microcode updates shipped to a single address, generally a central site, for better network management control. The alternate address is controlled through assignment of a Teleprocessing Control Number (TPC#) or Microcode Control Number (MC#). Redistribution of the microcode is the responsibility of the customer.

Publications: Refer to the latest level of IBM System/370 Bibliog-

raphy of Industry Systems and Application Programs, GC20-0370, for details of 3791 and 3730 system publications.

SPECIFY: For details of specify codes, refer to 3790 Communication System Configurator, GA27-2768.

- [1] Voltage (AC, 1-phase, 3-wire, 60Hz): Moisture proof plug -- #9902 for 208 V, or #9904 for 230 V. For Locking plug -- #9884 for 208 V, or #9886 for 230 V.
- [2] Color: Available at time of manufacture only. #9041 for Red, #9042 for yellow, #9043 for Blue, or #9045 for gray.
- [3] Up-ending Kit: In the event the 3791 must be placed on end to enter installation area, specify #9840.
- [4] Cables; See M10000 pages for prices and ordering instructions.
- [5] ASCII Support: Specify #9022. ASCII support is provided for the host link, diskette, 3277, 3284, 3286, 3287, 3288, 3732, 3736, and 3791 Line Printer (#4710, 4711 or 4715). Only ASCII support type B is provided for the 3287, 3732 and 3736. **Prerequisite:** #9171 with #9275.
- [6] Print Belt Character Set: Specify for 3791 Line Printer (feature codes #4710, 4711 or 4715) one of the following. These specify codes are available at time of manufacture only. If additional print belts are required, see "Print Belts" in M10000 pages-Accessories. The 48-character and 128-character print belts can be used for ASCII or EBCDIC.
 - #9071 48-character set, ASCII
 - #9074 64-character set, ASCII
 - #9075 96-character set, ASCII
 - #9076 128-character set, DP/WP EBCDIC (1)
 - #9077 96-character set, WP EBCDIC - Courier (2)
 - #9078 96-character set, WP EBCDIC - Artisan (2)
 (1) Allows text and data to be printed in 3730-3790 systems without the need to change print belts.
 (2) Cannot be installed with Feature Code #4715.

[7] Configuration Support: Specify #9171 for 3730 Distributed Office Communication System, including support for 3732 Text Display Station and 3736 Printer. **Prerequisite:** None. **Field installation:** Yes. **Limitations:** Not available with model 1A, 1B, 1C, 2A or 2B, or with Configuration Support #9431, #9155, #9165, #9169, #9175 or #9195.

[8] Configuration: The following function and attachment specify codes must be selected to support the terminals to be attached to a 3791 model 11C, 12A or 12B.

Attachment	Specify	Comment
3793 Attachment	#9011	Specify that a 3793 is to be attached by ordering quantity. Maximum: One. Prerequisite: #9275.
3277, 3284, 3286, 3287, 3288 Attachment	9200	Specify total number of devices attached by ordering quantity. Maximum: 29. Prerequisite: #9275.
3732, 3736 Attachment	9016	Specify combined total of 3732s and 3736s by ordering quantity. Maximum: 30 if #9275 is specified ... 16 if #9275 is not specified. Prerequisite: None.

Support Functions

Function	Specify	Comment
Line Printer	#9561	132 print positions. Prerequisite: None.
Test Site	9595	To designate a 3791 location as a test site for Mandatory Control Code Engineering Changes. Prerequisite: #9285. Limitation: One per network.
Alternate Mailing Address	#9596	To designate that an alternate mailing address is available for microcode updates. Prerequisites: None.
RJE Function	9541	Specify only if required. Cannot be installed if Magnetic Tape Attachment (#7840) is installed. Maximum: One. Prerequisite: #9285 with #9011 or #9200.
Additional User Sessions	9345	Optional - order only if required. Provides 15 add'l user sessions. (basic system provides 16 user sessions). Maximum: One. Prerequisite: #9275.



3791 Controller Models 11C, 12A, 12B (cont'd)

- System Activity 9149** Specify to define concurrent device activity.
Minimum: One. Maximum: 31. Prerequisite: #9275.
- Batch Data Exchange via Diskette 9037** Optional - order only if required. Required for support of user programming when #9285 is not specified. *Maximum: One. Prerequisite: #9275.*
- Host Communication Support 9285** Optional. Required for applications involving host system communications. Required for support of user programming when #9037 is not specified. *Maximum: One. Prerequisite: #9275 with #1515, or #6301 or #6302, or #6303.*
- Extended Function 9275** Optional. Required for support of automated text, user application programming, and 3730-3790 concurrent operations. *Maximum: One. Prerequisite: None.*

PRICES:	Mdl	MRC	MLC 2 yr	Purchase	MMMC
3791	11C	\$1,159	\$ 986	\$32,660	\$321
	12A	1,334	1,135	38,760	311
	12B	1,510	1,285	44,860	365

Rental Plan: Plan B Purchase Option: 55% Machine Group: D
Warranty: B Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

FIELD CONVERSION CHARGES

- Model 1C to Model 11C **
- Model 1C to Model 12A **
- Model 1C to Model 12B **
- Model 2A to Model 12A **
- Model 2A to Model 12B **
- Model 2B to Model 12B **
- Model 11C to Model 12A \$ 6,100
- Model 11C to Model 12B \$12,200
- Model 12A to Model 12B \$ 6,100

** For field conversions of purchase 3791 mdls 1C, 2A or 2B to 3791 mdls 11C, 12A or 12B, call the 3790 Marketing Center Manager for assistance in planning the model conversion.

Model upgrade requires replacement of disk storage. Adequate provision must be made for retaining data contained on disk storage unit and elimination of user-proprietary information.

SPECIAL FEATURES

SECURITY KEYLOCK (#6350). Allows the 3791 to be "powered on" only with key. Removing the key does not turn power off. For additional or replacement keys, see M10000 pages. **Maximum: One. Field installation: Yes.**

DEVICE ATTACHMENT FEATURES

LOCAL CHANNEL ATTACHMENT (#1515). Provides for direct attachment to any S/370 processor*, 4300 processor, or 3031, 3032 or 3033 processor, via an integrated byte and/or block multiplexer channel or via a 2870 byte multiplexer or 2880 block multiplexer channel. Maximum distance from the channel is 200 feet. **Limitation:** Cannot be installed with SDLC Communication Feature (#6301, 6302 or 6303). **Maximum: One. Field installation: Yes.**

* This feature attaches to only one channel of a multiprocessing system.

ADDITIONAL DISK HEADS (#3221). Provides additional disk heads to improve performance in certain configurations and for certain applications. **Limitation:** Cannot be installed on 3791 mdl 11C. **Maximum: One additional head on mdl 12A ... two additional heads on mdl 12B. Field installation: Yes. Prerequisite: #9275, #9285.**

MAGNETIC TAPE ATTACHMENT (#7840). Provides for the attachment of the 3411 Magnetic Tape Unit and Control mdl 1. Additional tape capacity is provided by attachment of the 3410 Magnetic Tape Unit mdl 1 via the 3411. The maximum number of tape units (3410 and 3411) on a 3791 is four. **Limitations:** Only the 3411 Single Density (#3211) and the Dual Density (#3221) are supported by the 3791. Feature #7840 cannot be installed

with the RJE Function (#9541). **Maximum: One. Field installation: Yes. Prerequisites:** System/3-3790 Communication System Attachment (#7003) on 3411; Single Density (#3211) or Dual Density (#3221) on 3411; and 3791 Configuration Support #9171 with #9275 on 3791.

3793 ATTACHMENT (#7901). Allows one 3793 Keyboard Printer to be attached to the 3791. (See M 3793 pages.) **Maximum: One. Field installation: Yes. Prerequisite: #9011.**

DEVICE ATTACHMENT TYPE II, ADDITIONAL (#7912). Each feature allows attachment of any combination of up to four additional 3277s and/or 3284, 3286, 3287, 3288, 3732, 3736s to be attached to the 3791. (The first four devices can be attached with #9171 only specified.) **Maximum: Seven, but restricted to a maximum of 31 devices. Field installation: Yes. Limitations:** All 3277s and 3732s must have a keyboard. If printer feature #4710, #4711 or #4715 is attached, maximum number of devices is restricted to 30. **Prerequisites:** #9016 to attach additional 3732s and 3736s, or #9016 with #9200 to attach additional 3732s, 3736s, 3277s, 3284s, 3286s, 3287s and 3288s.

CONTROL STORAGE FEATURES

The amount of control storage to be ordered for the 3730 Distributed Office Communication System (#9171) depends on both the quantity and type of attachments in the system configuration. See 3790 Communication System Configurator, GA27-2768, to determine the correct quantities of control storage.

CONTROL STORAGE INCREMENT, TYPE IA (#1603). Provides 16,384 positions of additional control storage. **Maximum: One. Field installation: Yes.**

CONTROL STORAGE INCREMENT, TYPE IIA (#1613). Provides 16,384 positions of additional control storage. **Maximum: Two. Field installation: Yes.**

COMMUNICATION FEATURES

EIA INTERFACE (#3701). Provides EIA interface for the attachment of an IBM or other external modem. **Limitation:** Cannot be installed with the 1200 bps modems (#5500 or #5501). **Maximum: One. Field installation: Yes. Prerequisite:** SDLC Communication Feature with or without Business Machine Clock (#6301, 6302, 6303).

MODEM, 1200 BPS INTEGRATED, NON-SWITCHED (#5500). Provides an integrated modem for communication with the host system over non-switched lines. No external modem is required. **Limitation:** Cannot be installed with communications feature #3701, #5501, #6302 or #6303. **Maximum: One. Field installation: Yes. Prerequisite:** SDLC Communications Feature with Business Machine Clock (#6301). **Specify: #9651** for 4-wire strapping, or **#9652** for 2-wire strapping.

MODEM, 1200 BPS INTEGRATED, SWITCHED (#5501). Provides an integrated modem with an answering capability for communication from the host system over switched lines via a telephone company supplied Data Access Arrangement Type CBS, DAA or FCC, or equivalent. The coupling device determines whether the answering capability is manual or auto. **Limitation:** Cannot be installed with Communications Features #3701, #5500, #6302 or #6303. **Maximum: One. Field installation: Yes. Prerequisite:** SDLC Communications Feature with Business Machine Clock (#6301).

SDLC COMMUNICATION FEATURE WITH BUSINESS MACHINE CLOCK (#6301). Required for attachment to communication lines through the 1200 bps Integrated Modem (#5500 or #5501) or, via an EIA Interface (#3701) to any external modem which does not provide its own clocking. Half speed or 600 bps is available with this feature. **Limitation:** Cannot be installed with SDLC features #6302 or 6303 or Local Channel Attachment (#1515). **Maximum: One. Field installation: Yes.**

SDLC COMMUNICATION FEATURE WITHOUT BUSINESS MACHINE CLOCK (#6302). Required for attachment to communication lines via an EIA Interface (#3701) and an external modem which provides its own clocking up to 2400 bps. **Limitation:** Cannot be installed with SDLC Features (#6301, 6303), 1200 bps Modem Features (#5500, #5501), or Local Channel Attachment (#1515). **Maximum: One. Field installation: Yes.**

SDLC COMMUNICATION FEATURE WITHOUT BUSINESS MACHINE CLOCK (#6303). Required for attachment to communication lines via an EIA Interface (#3701) and an external modem which provides its own clocking of up to 9600 bps. **Limitation:** Cannot be installed with Communication Features #1515, #5500, #5501, #6301 or #6302. **Maximum: One. Field installation: Yes.**

LINE PRINTERS

LINE PRINTER 80 PRINT POSITIONS (#4710). [155 lpm - 6 lines per inch (2.54 cm)] Provides a line printer with maximum speed of 155 lpm with 48-character set, 120 lpm with 64-character set, 80 lpm with 96-character set, and 40 lpm with



3791 Controller Models 11C, 12A, 12B (cont'd)

128-character set. Included as standard is one operator-interchangeable print belt (48-, 64-, 96-, or 128-character set). ASCII or EBCDIC must be specified. Capability to print on continuous fan fold paper up to 80 print positions on an 8 inch (20 cm) print line with line spacing of 6 lines per inch (2.5 cm). Paper up to six parts plus carbon (maximum total thickness is 0.50 mm (.020 inches) can be accommodated. Maximum paper width is 15 inches overall. Refer to Form Design Reference Guide for Printers (GA24-3488) for form design considerations. Card stock is not recommended. A form-jam detection capability is provided. Order IBM Part No. 1136634 or equivalent, for replacement ribbons. **Maximum:** One. **Field installation:** Yes. **Specify:** See "Print Belt Character Set" under "Specify" for ordering 48-, 64-, 96- or 128-character sets.

LINE PRINTER, 132 PRINT POSITIONS (#4711). [155 lpm - 6 lines per inch (2.54 cm)] Provides a line printer with maximum speeds of 155 lpm with 48-character set, 120 lpm with 64-character set, 80 lpm with 96-character set, and 40 lpm with 128-character set. Included as standard is one operator interchangeable print belt (48-, 64-, 96- or 128-character set). Capability to print on continuous fan fold paper up to 132 print positions. ASCII or EBCDIC character set must be specified on a 33.5 cm (13.2 inch) print line with line spacing of 6 lines per inch (2.5 cm). Paper of up to six plus carbons (maximum total thickness is .020 inches or 0.50 mm) can be accommodated. Refer to Form Design Reference Guide for Printers (GA24-3488) for form design considerations. Card stock is not recommended. A form-jam detection capability is provided. Order IBM Part No. 1136634 or equivalent for replacement ribbons. **Maximum:** One. **Field installation:** Yes. **Specify:** See "Print Belt Character Set" under "Specify" for ordering 48-, 64-, 96- or 128-character sets.

LINE PRINTER - 132 PRINT POSITIONS (#4715). [410 lpm] Provides a higher speed line printer with maximum speeds of 410 lpm with 48-character set, 300 lpm with 64-character set, 230 lpm with 96-character set, and 160 lpm with 128-character set. Included as standard is one operator-interchangeable print belt (48-, 64-, 96- or 128-character set) and a forms stand which is an integral part of this feature. ASCII or EBCDIC character set must be specified. Capability to print on continuous fan fold paper up to 132 print positions on a 13.2 inch (33.5 cm) print line with line spacing of 6 lines per inch (2.5 cm). Paper of up to six parts plus carbon (maximum total thickness is .020 inches or 0.50 mm) can be accommodated. Refer to Forms Design Reference Guide for Printers (GA24-3488) for form design considerations. Card stock is not recommended. A form-jam detection capability is provided. Order IBM Part No. 1136670 or equivalent for replacement ribbons. **Maximum:** One. **Field installation:** Yes. **Specify:** See "Print Belt Character Set" under "Specify" for ordering 48-, 64-, 96- or 128-character sets.

Special Feature Prices:		ETP/		Purchase	MMMC
		MAC/ MRC	2 yr		
Local Channel Attach	#1515	\$ 88	\$ 75	\$3,000	\$ 4.00
Control Storage Increment					
Type IA	1603	58	49	1,170	10.00
Type IIA	1613	58	49	1,170	10.00
Add'l Disk Heads	3221	32	27	1,080	17.00
EIA Interface	3701	12	10	400	4.00
Line Printer 155 lpm					
80 Print Positions	4710	177	151	6,175*	56.00
132 Print Positions	4711	199	169	6,825*	59.50
Line Printer 410 lpm					
132 Print Positions	4715	351	299	11,960	114.00
1200 bps Integrated Modem					
Non-switched	5500	19	16	630	5.00
Switched	5501	25	21	860	7.00
SDLC Communication Feature					
w Bus Mach Clock	6301	19	16	670	3.00
w/o Bus Mach Clock	6302	12	10	450	2.50
w/o Bus Mach Clock	6303	35	30	1,200	10.50
Security Keylock	6350	35 SUC	-	35	NC
Magnetic Tape Attach	7840	182	155	6,200	8.00
3793 Attachment	7901	36	31	1,300	3.00
Dev Attach, Add'l Type II	7912	32	27	1,100	3.00

* Customers who may elect to purchase #4710/4711 and later upgrade to #4715 should consider the purchase of #4715 initially rather than #4710 or #4711.

ACCESSORY: For shipment with machine, order the feature number indicated below at the price listed in the M10000 pages. See M10000 pages for additional information and field installation.

FORMS STAND (#4450). [For 155 lpm Line Printer features #4710 and #4711 only] Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing. A forms stand is an integral part of the 410-lpm Line Printer feature (#4715).



3792 AUXILIARY CONTROL UNIT

Purpose: Provides for the attachment of up to four 3793 Keyboard-Printers, up to two communications lines for 2741 Communication Terminals, and as a feature, a line printer ... see "Special Features." The 3792 can be attached to the 3791 at a distance up to 2,000 feet.

Maximum: Three per 3791 Controller.

Highlights: Up to four 3793 Keyboard-Printers and up to two communications lines can be attached to the 3792 as a subcluster to the 3791. The 3792 attaches to the 3791 via Device Attachment Type I (#7900) on the 3791 at a distance of up to 2,000 feet. Buffering, controlling, and checking of input and output data are provided.

Limitations: Only one 3792 Line Printer feature (#4712 or #4713) can be attached to a 3790 system. The one printer feature may be on any one of the three 3792 control units attachable to the 3791 controller. If Line Printer (#4712 or #4713) is installed, then the combined total of 2741 lines and 3793s cannot exceed four.

PREREQUISITE: A 3791 Controller equipped with Device Attachment Type I (#7900).

Communications Facilities: See M 2700 pages.

Modem: (3792/2741 Communications)

IBM Leased Line Adapter (#5400) on the 3792.

Bibliography: GC20-0370

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Available at time of manufacture only. Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Color: Available at time of manufacture only. Specify #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Print Belt Character Set: Specify for 3792 Line Printer (#4712 or #4713). These specify codes are available at time of manufacture only. See "Print Belt" in M 10000 pages if more than one print belt is required.

- #9071 -- 48 Character Set, EBCDIC
- #9072 -- 64 Character Set, EBCDIC
- #9073 -- 96 Character Set, EBCDIC

[4] Attachment position on the 3791: Specify #9110 for first 3792, #9120 for second 3792, and #9130 for third 3792.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMM
3792	1	\$ 200	\$ 170	\$ 6,900	\$34.50

Plan Offering: Plan B Warranty: B Maintenance: D
 Purchase Option: 55% Useful Life Category: 2 Per Call: 1
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%

SPECIAL FEATURES

DEVICE ATTACHMENT FEATURES

LINE PRINTER - 80 PRINT POSITIONS 155 LPM MAX (#4712). Provides a line printer with maximum speeds of 155 LPM with 48 character set, 120 LPM with 64 character set, and 80 LPM with 96 character set. Included as standard is one operator interchangeable print belt (48, 64, or 96 character set). Capability to print on continuous fan fold paper up to 80 print positions on an 8-inch (20 cm) print line. 6 lines per inch (2.54 cm). Paper up to six parts plus carbon (maximum total thickness is .020 inches or .50 mm) can be accommodated. Maximum paper width is 15" overall. Card stock is not recommended. A form jam detection capability is provided. Order IBM Part No. 1136634 or equivalent, for replacement ribbons. **Maximum:** One. **Limitations:** Line printers on the 3791 and 3792 must have the same number print positions. **Field Installation:** Yes. **Specify:** See "Print Belt Character Set" under Specify for ordering 48, 64 or 96 character sets.

LINE PRINTER - 132 PRINT POSITIONS 155 LPM MAX (#4713). Provides a line printer with maximum speeds of 155 LPM with 48 character set, 120 LPM with 64 character set, and 80 LPM with 96 character set. Included as standard is one operator interchangeable print belt (48, 64 or 96 character set). Capability to print on continuous fan fold paper up to 132 print positions on a 15-inch (38.1 cm) print line. 6 lines per inch (2.54 cm). Paper up to six parts plus carbon (maximum total thickness is .020 inches or .50 mm) can be accommodated. Card stock is not recommended. A form jam detection capability is provided. Order IBM Part No. 1136634 or equivalent, for replacement ribbons. **Maximum:** One. **Limitations:** Line printers on the 3791 and 3792 must have the same number print positions. **Field Installation:** Yes. **Specify:** See

"Print Belt Character Set" under Specify for ordering 48, 64 or 96 character sets.

3793 Attachment (#7901). To attach one 3793 Keyboard-Printer to the 3792 ... see 3793 for details. **Maximum:** Four. **Limitation:** If a Line Printer (#4712, #4713 on the 3792) is installed, then the combined total of 2741s and 3793s cannot exceed four. **Field Installation:** Yes.

Control Storage Features: Whether additional control storage is to be ordered is dependent on both the quantities and types of attachments in the 3790 system configuration. See "IBM 3790 Communication System Configuration," GA27-2768-6, for details.

CONTROL STORAGE INCREMENTS (#1622). Provides an 8,192 byte increment of control storage. **Maximum:** One. **Field Installation:** Yes.

COMMUNICATIONS FEATURES:

ADAPTER BASE (#1021). Provides for the installation of up to two Asynchronous Communications Controls (#1081). **Maximum:** One. **Field Installation:** Yes.

ASYNCHRONOUS COMMUNICATIONS CONTROL (#1081). Provides for the installation of an EIA Interface (#3701) for external modems, or an IBM Leased Line Adapter (#5400) for communications with a 2741. **Maximum:** Two. **Field Installation:** Yes. **Prerequisite:** Adapter Base (#1021).

EIA INTERFACE (#3701). Provides an EIA interface for the attachment of an IBM or other external modem. **Maximum:** Two. **Specify:** #9003 for first #3701 feature; #9004 for second feature. **Field Installation:** Yes. **Prerequisites:** Asynchronous Communications Control (#1081). The 3792 Communications Support required on the 3791 should specify whether External Modem attached to the 3792 will or will not have auto-answer. See "3792 Communications Support" under "Specify" on 3791 page.

IBM LEASED LINE ADAPTER (#5400). Provides a modem for communications with 2741 terminals via point-to-point non-switched communications lines. **Specify:** #9651 for 4-wire strapping (if receive interrupt feature is used by the 2741, 4-wire strapping is req'd.); or #9652 for 2-wire strapping ... #9001 for first #5400 feature, #9002 for second #5400 feature. **Field Installation:** Yes. **Maximum:** Two. **Prerequisite:** Asynchronous Communications Control (#1081).

* NOTE: Specify codes #9001 (1st #5400) and #9004 (2nd #3701) are mutually exclusive. Specify codes #9002 (2nd #5400) and #9003 (1st #3701) are mutually exclusive.

SECURITY KEYLOCK (#6350). Allows the 3792 to operate only when the key is in place ... removing the key causes operation to stop. For additional or replacement keys, see M 10000 pages. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMM
Adapter Base	#1021 \$ 49	\$ 42	\$ 1,700	\$ 1.00
Asynch Comm Cntrl	1081 19	16	650	3.00
Control Storage Incre	1622 32	27	637	5.00
EIA Interface	3701 12	10	400	4.00
Line Printer - 155 LPM Max				
80 Print Positions	4712 274	233	9,500	56.00
132 Print Positions	4713 306	260	10,500	59.50
IBM Leased Line Adptr	5400 19	16	650	5.00
Security Keylock	6350 35 SUC --		35	NC
3793 Attachment	7901 36	31	1,300	3.00

Accessories: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND (#4450) -- Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.



3793 KEYBOARD-PRINTER

Purpose: Printed hard-copy and key data-entry facilities for attachment to a 3791 Controller or a 3792 Auxiliary Control Unit.

Highlights: A modified Selectric® II typewriter terminal oriented to the functions of the 3790 system.

- **Keyboard:** Includes an EBCDIC keyboard with operator guidance lights and switches.
- **Printer:** A 15.5 cps printer (6 lines/inch) with friction-feed platen or, optionally, pin-feed platen. A Courier 72 print element (Part No. 1167043) is supplied. 3790 programs can provide vertical forms movement and automatic print element positioning.

The 3793 can be located up to 48 feet from the 3791 or 3792, with the customer responsible for the connecting cable. See the installation planning manual for details.

PREREQUISITE: One 3793 Attachment (#7901, 7902 or 7903) on a 3791 or 3792 per 3793.

Bibliography: GC20-0370

SPECIFY: Voltage (115 VAC, 1-phase, 60 Hz): **#9881** for non-lock plug.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3793	1	\$ 119	\$ 101	\$ 3,450	\$ 28

Plan Offering: Plan B Warranty: B Maintenance: D
 Purchase Option: 55% Useful Life Category: 2 Per Call: 1
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%

SPECIAL FEATURES

POWER LINE KEYLOCK (#5560). A key-operated switch in the power cord. When switch is in the off position, no action is possible at the 3793. Two keys are supplied with the feature. See M 10000 pages for additional or replacement keys. **Maximum:** One. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Power Line Keylock #5560	\$ 75	SUC	--	\$ 75 NC

Accessories: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

PIN FEED PLATEN (#9509) -- In lieu of standard friction feed platen. **Maximum:** One. See M 10000 pages for available options and additional #s to be specified.

IBM 3800 PRINTING SUBSYSTEM

Purpose: Printer output unit for S/370 mdls 145, 145-3, 148, 155 II, 158, 165 II, 168 and a 3031, 3032, 3033, 4331 or 4341 Processor. A special feature allows data input from magnetic tape without printer output unit attachment to a system.

Highlights: Prints on single part continuous forms providing 50 discrete paper sizes ... printing is repeated for multiple copies ... every copy is "original" quality.

Print Speed Range:

Forms Length	Forms Per Min Up To:	Lines Per Minute*		
		6 LPI Up To:	8 LPI Up To:	12 LPI Up To:
3-1/2	526	7,890	10,520	15,780
5-1/2	334	9,018	12,024	18,036
7	263	9,468	12,624	18,936
8-1/2	215	9,675	12,900	19,350
11	167	10,020	13,360	20,040

* Single copy speeds.

Printer job throughput can vary depending on form length, number of copies needed, and functions exercised.

52K byte storage standard for page buffering and control of printer operations ... 42K when operated without system attachment.

Pitches -- 10, 12 and 15 character per inch (CPI) standard ... **Print Line** -- maximum of 136 positions at 10 CPI, 163 positions at 12 CPI, and 204 positions at 15 CPI ... 10, 12 and 15 CPI can be intermixed within page or line ... vertical line spacing of 6, 8 and 12 lines per inch ... intermixed line spacing within page.

Character Sets Standard

Character Style	Pitch (CPI)			Special Underscored
	10	12	15	
Gothic	X	X	X	Yes
Gothic 15 Condensed			X	Yes
Text 1 (Upper Case)	X			Yes
Text 2 (Lower Case)	X			Yes
OCR A	X			
OCR B	X			
Format	X	X	X	
Katakana	X	X	X	

NOTE: Includes World Trade National Use Graphics.

Character sets are organized in blocks of up to 64 characters and are held in subsystem read only storage.

Electronic character generation using Writable Character Generation Storage -- 128 Writable Character Generation Storage positions are standard and organized in two 64 character Writable Character Generation Modules (WCGM) ... character sets are program selected without operator intervention and dynamically loaded into hardware WCGMs ... when operating offline under control of Tape-to-Printing Subsystem (#7810), character sets are loaded into read only storage (WCGMs) by the operator through the operator panel, or by the 3800 control file tape which is an output of the Utility Program Product, 5748 UT2. Customer-designed characters require use of the Utility Program ... an additional increment of 127 Writable Character Generation Storage Positions is optional, providing dynamic storage for printing 4 character styles and/or pitches within one data set -- this represents up to 255 graphics online with no throughput loss ... dynamic storage allows character substitution under program control ... a customer may design his own characters. When operating under control of Feature #7810, customer-designed characters require use of Utility Program Product 5748 UT2.

Gothic 15 (15 characters/inch at 8 lines/inch) -- 11" x 14-7/8" reports can be reduced to 8-1/2" x 11" ... convenient size ... increased throughput, reduced forms cost, reduced filing space by using reduction or exploiting new maximum print span of 204 positions. The application of 12 lpi vertical spacing with the Gothic 15 Condensed character set can result in a further reduction in paper volume of up to about 30% beyond the savings projected in reducing page sizes by applying the 15 pitch character set at 8 lpi.

Optical Character Recognition (OCR) Printing -- alphanumeric OCR A and the less stylized OCR B fonts can be intermixed with non-OCR fonts with no reduction in printing throughput ... documents may be processed by the 1287, 1288, 3762 and 3886 Optical Character Readers. Refer to the appropriate sales manual pages for specific capabilities.

Note: The OCR characters are designed to be representative of (but not always identical to) the mean character (shape) centerline described in the "United States of America Standard Character Set for Optical Character Recognition, Size A, USAS X3.17

-1966" for OCR-A font (also referred to as ANSCS OCH) and the "European Computer Manufacturers Association's Standard ECMA-11 for Alphanumeric Character Set OCR-B for Optical Recognition 2nd Edition, October 1971" for OCR-B font.

Text Character Set -- upper and lower case characters, serifed design ... special graphics ... no reduction in throughput.

Format 10, 12 and 15 Pitch -- merge format and data ... program controlled for online operation, for offline operation with Feature (#7810) format character sets require Utility Program Product, 5748 UT2.

Copy Modification Function -- identify copies with legends, phrases, or names (e.g., Customer Copy, For Accounting Purposes Only, etc.) ... address each report copy to speed distribution ... spot carbon or field blackout functions ... identification and deletion program controlled. Customized forms with the identification, deletion and formatting functions. When operating under control of Feature (#7810), Copy Modification Function requires use of Utility Program Product, 5748 UT2.

Format Overlay -- optical image system ... prints high quality document and report formats, designs or other constant data ... merge format and data ... program controlled. When operating under control of Feature (#7810), overlay is invoked from the operators panel or by the Utility Program Product, 5748 UT2.

Single Part Continuous Form Output -- including custom printed forms ... no deleaving ... no carbon disposal ... faster turnaround ... program control of copy quality ... up to 255 copies ... job separation marking use Mark Form function.

Optional Burster-Trimmed-Stacker Output -- eliminates burster/deleaver bottlenecks ... offset separation between data set copies ... remove output while printing ... first-in, first-out job sequence ... trimmed edges.

Optional Channel Switching -- manual switches provide system configuration flexibility through the use of the 2914 Manual Switch, Model 1 (RPQ) or the Two Channel Switch (#8170) ... automatic switching is provided by the Dynamic Two Channel Switch (#8171) for two processors in a tightly coupled multiprocessing configuration, and two channels on a single CPU providing alternate path capability.

Laser Safety -- the 3800 contains a laser assembly. The 3800, including the laser assembly, is designed to comply with the safety standards proposed by the United States Department of Health, Education and Welfare (Proposed Performance Standard for Laser Products, September 4, 1974 - Class I, 21 CFR 1040).

Limitations: Prints on discrete form sizes. Utilizes five form depths: 3-1/2", 5-1/2", 7", 8-1/2" and 11" ... ten forms widths measured edge to edge: 6-1/2", 8-1/2", 9-1/2", 9-7/8", 10-5/8", 11", 12", 13-5/8", 14.3", 14-7/8" which permutes to 50 discrete sizes. Forms are refolded in 7" (2 x 3-1/2), 8-1/2" and 11" (2 x 5-1/2) in lengths.

Character and forms overlay printing restricted from first and last 1/2" of forms length. A printed line can begin a minimum of 0.5 inches from the left paper edge and cannot exceed a length to position a character nearer than 0.5 inches from the right paper edge for all widths except 14-7/8" where the stated dimension is 0.675 inches from the right.

Paper must be from 15 lb to 24 lb basis weight. See GA26-1633 for details of weight and other forms considerations. Left-hand side of form is a fixed location in the machine, print line adjustment is by electronically moving the line. First print position can move to the right 5.7 inches but will cause an equivalent number of positions at the right end to be moved beyond the above defined print line boundaries.

It is recommended that printing not occur within 0.100 inches of any binder holes or corner cuts within the form.

PREREQUISITE: A control unit position on a system channel and/or Tape-to-Printing Subsystem Feature (#7810).

S/370 mdl 145 (excluding 3145-3) -- byte multiplexer channel (standard), Selector Channels (first one is standard), Block Multiplexer Channels (special features) ... see 3145. Attachment to the byte multiplexer channel is not recommended. Selector channel attachment is not recommended unless dedicated.

S/370 mdl 145-3, 148 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3, 3148. Attachment to the byte multiplexer channel is not recommended.

S/370 mdl 155 II, 158 -- byte multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), Block Multiplexer Channels (first two are standard) ... see 3155, 3158, 3158-3.

S/370 mdl 165 II, 168 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannel (special feature) of 2870, shared or non-shared subchannel of 2880 ... see 2860, 2870, 2880. Selector channel attachment is not recommended unless dedicated.

3800 Printing Subsystem (cont'd)

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (special feature), block multiplexer channel (special feature) ... see 4331. *Note: Attachment to the byte multiplexer channel is not recommended.*

4341 Processor -- byte multiplexer channel (standard), block multiplexer channel (two are standard) ... see 4341. *Note: Attachment to the byte multiplexer channel is not recommended.*

Tape-to-Printing Subsystem (#7810) -- In lieu of or in addition to system channel attachments above ... see "Special Features."

Bibliography: GC20-0001, GA26-1653, GA26-1654

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: Machine color is white, specify end cover color -- #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Tool Kit: #9330 -- required for CE maintenance.

For rental customer -- specify #9330 for the first 3800 ordered for a customer. If required for a multiple machine installation, because of physical machine locations, an additional tool kit(s) is available

For purchase customer -- specify #9330 on each 3800 machine order. When installed 3800s are purchased, a tool kit is to be ordered on a no-charge for each machine. **Note:** A Tool Kit (#9220) is required with Burster-Trimmed-Stacker (#1490) ... see #1490 below.

PRICES: 3800 Printing Plan

Rental	Mdl	Basic Monthly Charge/MRC	BETP/MLC 2 Yr	Monthly Use Charge Rate
	1	\$7,708	\$6,560	2.5 mills/foot
Purchase Price	Basic Monthly Maintenance Charge	Additional Monthly Maintenance Charge Rate		
\$325,500	\$ 489	2.5 mills/foot		

Plan Offering: Plan C (Monthly Use Plan) Warranty: B
Purchase Option: 50% (not applicable to Monthly Use Charges)
Maintenance: Available 24 hours per day, 7 days a week.
Per Call: 3 Useful Life Category: 2 Upper Limit Percent: 0%
Termination Charge Months: 5 Termination Charge Percent: 25%
Educational Allowance: 10% (Does not apply to Monthly Use Charge Rate)

SPECIAL FEATURES

BURSTER-TRIMMER-STACKER (#1490). Provides an additional output stacking mode. Bursts the five forms lengths to individual sheets and stacks sheets sequentially. Also trims left and right 0.5 inches carrier strip from output sheet. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** One tool kit #9220 is required for CE maintenance. Contact the account Field Manager for requirements. For rental customer -- specify #9220 for first Burster-Trimmed-Stacker feature ordered for a customer. If required for a multiple machine installation because of physical machine locations, an additional tool kit(s) is available on a no-charge MES. For purchase customer -- specify #9220 on each Burster-Trimmed-Stacker feature order. When installed Burster-Trimmed-Stackers are purchased, a tool kit is to be ordered on a no-charge for each feature.

127 WRITABLE CHARACTER GENERATION STORAGE POSITIONS, ADD'L (#5401). Additional increment of 127 positions allows up to 255 graphics to be printed within a data set. **Maximum:** One. **Field Installation:** Yes.

REMOTE SWITCH ATTACHMENT (#6148). To attach the Two Channel Switch (#8170) to a configuration control panel. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Two Channel Switch (#8170).

TAPE-TO-PRINTING SUBSYSTEM FEATURE (#7810). Allows the 3800 to be operated from magnetic tape data. Either 3411/3410 or 3803/3420 tape systems can be used. May be operated either offline under operator control or online. Up to eight tape control units may be attached provided that power sequencing and control connection for all other than one are provided by a system; and provided that all 3803 control units have at least one path, which may be switchable, to a S/360, S/370, or 4300 Processor. This

feature will accept the non-IBM system print tape formats described below.

Burroughs: B7000/B6000 Print Backup Tapes. For further details refer the customer to:

B7000/B6000 Series System Software Operational Guide, Volume 1 (Form #5001563), Section 1 (Backup).

Tape Files must be 7 or 9 track, EBCDIC coding, and ANSI (USASI) standard tape labels and data formats. For further details refer the customer to B7000/B6000 series I/O System Reference Manual (Form #5001779).

For definition of the line printer control words, refer the customer to Burroughs B6700 Handbook (Form #5000276).

Honeywell: Series 60 (level 66/6000) Bulk Media Conversion program formats and Standard System formats that have the following characteristics:

- Variable length records
- Binary or BCD mode
- 7 or 9 track
- Standard labeled or non-labeled
- Low or high density
- Standard printer commands with or without edit characters

For further details refer the customer to the following Honeywell publications:

DD11 Bulk Media Conversion
DD07 File and Record Control
DB82A I/O Programming

Sperry Univac: 1100 series systems System Data Format (SDF) Symbiont print tape. For further details refer the customer to:

Sperry Univac 1100 Series Executive System Volume 3 System Processors (Form #4144.3).

Tape files may be 7 or 9 track, Field Data or ASCII.

For description of tape labels and file format and definition of line printer control functions refer the customer to:

Sperry Univac 110 Series Executive System Volume 2 EXEC (Form #4144.2). **Limitations:** Selection of the non-IBM system tape format to be used must be made by the operator before printing.

Where more than one print character is represented by one 8-bit byte (data packing) on the non-IBM system print tape, applications using character densities above 8160 characters per 11 inch page may impact 3800 overall throughput and must be evaluated.

When using non-IBM system print tape formats, control tapes produced by IBM 3800 Tape-to-Printing Subsystem Feature Utility (Program Product 5748-UT2) are supported only with an IBM record format of VBM (variable length block machine language) with standard IBM labels or no labels.

Maximum: One. **Field Installation:** Yes.

TWO CHANNEL SWITCH (#8170). To attach the 3800 to two S/370 or 4300 Processor channels which may be on the same CPU or on two different CPUs. Both interfaces must have the same device address. The two channel switch will allow operation on only one channel at a time. Selection of the channel which is to be operable is by means of manual switches on the control panel. **Maximum:** One. **Field Installation:** Yes.

DYNAMIC TWO CHANNEL SWITCH (#8171). Provides the additional capability of an automatic two channel switch. The switch is designed to furnish symmetric two processor support for tightly coupled multiprocessor systems and to attach to two channels from a single CPU to provide alternate path capability. For either tightly coupled multiprocessors or single CPU attachments, data transfer occurs only one channel path at a time. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Two Channel Switch (#8170).

Special Feature Prices:	BMC/MRC	BETP/MLC 2 Yr	Purchase BMMC	BMMC
Burster-Trimmed-Strk #1490	\$1,163	\$ 990	\$49,100	\$132.00
127 Writable Char Gen				
Storage Pos., Add'l 5401	85	72	3,905	14.50
Remote Switch Attach 6148	NC	NC	NC	NC
Tape-to-Ptg Subsys Fea 7810	308	262	10,500	24.50
Two Channel Switch 8170	223	190	8,545	11.50
Dynamic Two Chan Sw 8171	NC	NC	NC	NC

IBM 3803 TAPE CONTROL - MODEL 1

Purpose: Control unit for 3420 Magnetic Tape Units mdl 3, 5 and 7.

Highlights: Single channel control for up to eight 3420 tape units. Through special switching features, up to sixteen tape drives can be addressed through any of four 3803 control units. Features are offered to provide performance at 556 and 800 bpi in the seven track NRZI format or at 800 bpi in the nine track NRZI format or at 1600 bpi phase encoded.

The following table indicates feature numbers for corresponding functions:

Subsystem Function	Feature Name	3420 Tape Unit	3803 Control Unit
1600 bpi PE 9-track only	Single Density	#6631	#9570
1600 bpi PE/800 bpi NRZI 9-track	Dual Density	#3550	#3551
1600 bpi PE/556-800 bpi NRZI 7-track	Seven Track	#6407*	#6408

* Tape unit will only read or write 7-track tape.

PREREQUISITES: A control unit position on a S/360, S/370 or 4300 Processor system channel, or Tape-to-Printing Subsystem Feature (#7810) on a 3800 Printing Subsystem. When used with a 3800 with feature #7810, at least one path, which may be switchable, must be provided to a S/360, S/370 or 4300 Processor. When multiple control units (up to 8 are allowable) are connected to a 3800, all other than one must have power sequencing and control connection provided by a system.

For S/360 mdl 30 -- if the 3803 is attached to the 2030 selector channel via the 1400 Magnetic Tape Compatibility Feature (#4468), then 3420/1400 Compatibility (#9750) is required on the 2030 ... see "Specify" under 2030.

Limitations: Attachable to all S/360 and S/370 systems except S/360 mdl 20, 25 and 44, and S/370 mdl 115 and 125. **mdl 135:** NOT supported on byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or Selector Channel. Attachable to 4331, and 4341 Processors. For considerations see "4331 Channel Characteristics, GA33-1527." **Note:** A 3803 cannot be attached to the byte multiplexer channel on a 4341 Processor.

3420 mdl 4, 6 or 8 cannot be addressed through a 3803 mdl 1.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

Specify: [1] Either Dual Density (#3551) or Seven Track (#6408) must be ordered unless Single Density (#9570) is specified. Only one of the three features can be installed.

[2] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[4] If a tape switching configuration is being ordered, the 3803 must be equipped with a Communicator (#9071 or #9073) ... see table under "Tape Switching" below. If a Communicator feature is ordered for a 3803 without a switching feature, no tape units can be attached to that control unit.

PRICES Mdl	MAC/ MRC	FTP/ MLC	ETP/ MLC	Purchase	MMMC
		1 yr*2 yr	2 yr		
3803 1	\$757	\$696	\$636	\$23,670	\$109

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Assignable Unit Warranty: B Maintenance: A
Purchase Option: 55% Useful Life Category: 2 Per Call: 3
Model/Feature Additional Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

* FTP is 12-23 months.

ETP/FTP/MLC ... all models of the 3803 may be under ETP/MLC or ETP/MLC.

Model Changes: A 3803 mdl 1 may be converted to a 3803 mdl 2 in the field ... for Model Upgrade Price, see 3803 Tape Control mdl 2.

SPECIAL FEATURES

Note: All special features for the 3803 are field installable.

DUAL DENSITY (#3551). Provides for the attachment of tape units equipped with Dual Density (#3550) to read and write tapes at either 1600 bpi PE or 800 bpi NRZI nine track. Tape units equipped with Single Density (#6631) can also be attached. **Limitation:** Dual Density (#3551) cannot be installed in the same

control unit with either Single Density (#9570) or Seven Track (#6408).

REMOTE SWITCH ATTACHMENT (#6148). Provides for remote operation of the Two Channel Switch (#8100) on the 3803 mdl 1, from a remote console such as the configuration control panel (3058 or 3068) for a S/370 mdl 158 MP or 168 MP. Operation of the switch on the remote console will result in the same function as operation of the 3803 switch. The 3803 switches will be functionally inoperative when this feature is installed. The cable to the remote console is not provided by this feature. The cable used must contain three wires for each Enable/Disable switch to be installed. Each line must have a total loop resistance of less than 75 ohms when the remote switch completes the path. For operation with the 2925 mdl 10, 3058 or 3068, cable P/N 5351178 is required and should be ordered separate

SEVEN TRACK (#6408). Provides for the attachment of tape units equipped with Seven Track (#6407) to read and write tapes at either 556 or 800 bpi in the 7-track format compatible with tapes written by 729, 7330, 7335 and 2400 series tape units equipped with 7-track read/write heads. Includes the translator function, which, when used, causes 8-bit bytes from the I/O interface to be written on tape as 6-bit BCD characters and 6-bit BCD characters read from tape to be translated into their EBCDIC equivalents. The Data Conversion Function, also included, allows reading and writing of 8-bit bytes on 7-track tape by converting four tape characters into three storage bytes and vice versa. Tape units equipped with Single Density (#6631) can also be attached. **Limitation:** Cannot be installed in the same control unit with either Single Density (#9570) or Dual Density (#3551).

TWO CHANNEL SWITCH (#8100). Permits connection of the 3803 Tape Control to a second channel. Alternate path switching between two channels on the same system is under program control. Partitioning of attached tape units between channels on two different systems can be done using current procedures for logical device partitioning. These procedures involve the proper use of the operator commands VARY ON/VARY OFF (OS) or DVCDN/DVCUP (DOS).

Note: When installed on the S/360 mdl 30, the 3803 with #8100 is not supported under 1400 Magnetic Tape Compatibility (#4468), but is supported with the Programmed Mode Switch (#5856) when the tapes are operated in 360 mode under CS1400 program support.

TAPE SWITCHING: Switching configurations, via two, three or four control units, are available to provide access to:
(a) Up to eight tape units attached to a single control unit.
(b) Up to sixteen tape units, with eight attached to each of two control units.

All switchable tape units must be attached to the control units equipped with the switching features (2-Control Switch, 3-Control Switch or 4-Control Switch). Each control unit must be equipped with the appropriate Single Density, Dual Density or Seven Track feature for any drive in the pool to which it has access.

The table below indicates features required for the available switching options.

Switching Options	Features Required	Feature Numbers			
		On 1st 3803	On 2nd 3803	On 3rd 3803	On 4th 3803
2 x 8	Communicator 1-2	9071	9071	--	--
	2-Control Switch	1792	--	--	--
3 x 8	Communicator 1-2	9071	9071	9071	--
	3-Control Switch	1793	--	--	--
4 x 8	Communicator 1-2	9071	9071	9071	9071
	4-Control Switch	1794	--	--	--
2 x 16	Communicator 1-2	9071	9071	--	--
	2-Control Switch	1792	1792	--	--
3 x 16	Communicator 1-2	9071	9071	--	--
	Communicator 3-4	--	--	9073	--
	3-Control Switch	1793	1793	--	--
4 x 16	Communicator 1-2	9071	9071	--	--
	Communicator 3-4	--	--	9073	9073
	4-Control Switch	1794	1794	--	--

3803 Tape Control - Model 1 (cont'd)

Special Feature Prices:	MRC	FTP/		ETP/		Purchase	MMMM
		MAC/	MLC	MLC	MLC		
		1 yr*	2 yr	2 yr			
Tape Switching							
2-Cntrl Switch	#1792	\$223	\$205	\$187	\$187	\$ 7,020	\$11.00
3-Cntrl Switch	1793	286	263	240	240	8,955	17.50
4-Cntrl Switch	1794	335	308	281	281	10,530	17.50
Dual Density	3551	83	76	70	70	2,630	3.00
Remote Sw Attac	6148	33	30	28	28	1,045	NC
Seven Track	6408	83	76	70	70	2,630	3.00
Two Channel Sw	8100	166	153	139	139	5,265	5.50

* FTP is 12-23 months.

IBM 3803 TAPE CONTROL - MODEL 2

Purpose: Control unit for 3420 Magnetic Tape Units mdl 3 through 8.

Highlights:

- Standard control unit provides 6250 and 1600 bpi densities.
- 6250 Encoding/Checking Logic allows error correction on the fly for any single track or combinations of two tracks simultaneously. Errors may be corrected in all nine tracks of a single data block providing they occur in combinations of no more than two tracks at a time. Long tape blocks are subdivided by resync bursts which are inserted within the block to allow error tracks to return to full operation when reading forward, thereby restoring maximum error correction capability.
- Optional features provide 9-track (800 bpi) NRZI, or 9-track (800 bpi) NRZI with 7-track (800, 556, 200 bpi) NRZI formats.
- 9-track NRZI with 7-track NRZI features permit mixing 9 and 7-track tape units on the same 3803 mdl 2.

The following table indicates features for corresponding functions:

Subsystem Density	3803 Tape Control Model 2		3420 Tape Unit Mdl-3,5,7 Mdl-4,6,8	
	Feat Name	Feat #	Feat #	Feat #
9T - 6250	---	Standard	N/A	#6420
9T - 6250+1600	---	Standard	#6631	#6425
9T - 6250+1600+800	9 Tr NRZI	#5310	#3550	N/A
9T - 6250+1600+800 with				
7T - 800-556-200	7 Tr NRZI	#6320*	#6407	N/A

* Requires #5310.

- A pool of up to 16 tape units may be switched between 2, 3 or 4 control units.
- A 3803, via a two-channel switch feature, connects to two channels of the same system or two channels of different systems.
- Properly featured, a 3803 mdl 2 provides signal and power attachment for up to eight 3420 mdls 3, 4, 5, 6, 7. Model 8s may be attached as described under "Limitations."

PREREQUISITES: Control unit position on S/370 or 4300 Processor channel, or Tape-to-Printing Subsystem Feature (#7810) on a 3800 Printing Subsystem. When used with a 3800 with feature #7810, at least one path, which may be switchable, must be provided to a S/360, S/370 or 4300 Processor. When multiple control units (up to 8 are allowable) are connected to a 3800, all other than one must have power sequencing and control connection provided by a system. If attached to a 2860, a 3803 Mdl 2 Attachment (#7850) is required on each channel to which 3803 mdl 2s are attached. For the #7850, specify #9181 for the first channel of a 2860 ... #9182 for the second channel ... #9183 for the third channel. See 2860.

Systems Attachment: The 3803 mdl 2 attaches to a S/370 or 4300 Processor via the indicated channels:

System	3420 mdl 4	3420 mdl 6	3420 mdl 8
135	Selector †	Selector †	Selector †
135-3 - 138	Bik Multiplex	Bik Multiplex	Bik Multiplex
145	Selector †	Selector †	Selector †
145-3 - 148	Bik Multiplex	Bik Multiplex	Bik Multiplex
155 - 158	Bik Multiplex	Bik Multiplex	Bik Multiplex
165 - 168 - 195	2860/2880	2860/2880	2860/2880
3031	Bik Multiplex	Bik Multiplex	Bik Multiplex
3032	Bik Multiplex	Bik Multiplex	Bik Multiplex
3033	Bik Multiplex	Bik Multiplex	Bik Multiplex
4331	Bik Multiplex	---	---
4341	Bik Multiplex	Bik Multiplex	Bik Multiplex

† With or without Block Multiplexer Channel (#1421).

The 3803 mdl 2 may attach to S/360 mdls 50 thru 195 (67 in 65 mode only) by no-charge RPQ. RPQs must indicate the desired channel position and if the system operates under emulation.

Limitations: [1] 3803 mdl 2 attachment to S/370 mdls 135, 135-3, 138, 145, 145-3 and 148 is configuration sensitive because of potential system overrun. Consult *System 370 Model 135 Channel Characteristics* (GA33-3010) or *System 370 Model 145 Channel Characteristics* (GA24-3573) ... [2] The 3803 mdl 2 is not supported for attachment to byte multiplexer, multiplexer or 2870 Selector Subchannels ... [3] The 3803 mdl 2 operating with 3420 mdl 8s is limited to a maximum channel to control unit (total x dimension) cable length of 119 feet to the 2880 or selector channel of a S/370 mdl 145, 119 feet to the block multiplexer channel of a S/370 mdl 145-3 or 148, 103 feet to the block multiplexer channel of a S/370 mdl 155, 3032 or 3033, and 72 feet to a 2860 ... [4] The 3803 mdl 2 provides power and signal connections for 3420 tape drives. Up to eight drives of any model can be signal connected to a 3803 mdl 2. Note that 3420 mdls 4, 6 and 8 must signal connect to a 3803 mdl 2. [5] For all 4331 considerations, see 4331 *Channel Characteristics*, GA33-1527.

One 3803, either mdl 1 or mdl 2, provides power for up to eight 3420 mdls 3, 4, 5, 6 or 7. When the tape subsystem includes 3420 mdl 8s, one 3803, mdl 1 or mdl 2, may power a maximum of six 3420 mdl 8s or combinations of drives as listed in the table below.

Maximum number of drives which may be powered from one 3803.

No. of 3420 Model 8s	and	No. of 3420 Model 7s	and	No. of 3420 Models 3-6
6		0		0
5		1		0
5		0		2
4		2		1
4		1		2
4		0		3
3		4		0
3		3		1
3		2		2
3		1		4
3		0		5
2		5		0
2		4		2
2		3		3
2		2		4
2		1		5
2		0		6
1		***		***

*** If only one 3420 mdl 8, then any combination of seven additional tape units is permissible.

When the system includes more than one 3803 mdl 2 and the number of tape drives which must be signal connected to a control unit exceeds the maximum number of drives which may be powered from one 3803 (see table above), obtain power from another control unit using separate power cable (Group 144). Separate signal cable (Group 143) is also available.

A power supply feature (#9001) is available which allows eight 3420s of any model to be powered from one 3803 mdl 2 ... see "Specify." This feature is necessary only if:

- [1] The subsystem includes only one 3803 mdl 2 and the drives to be powered from it exceed the maximum specified in the table above, or
- [2] The power load still exceeds the table limitations for a 3803 when distribution by re-cabling with separate power and signal cables has been considered.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Density: 6250 and 1600 bpi are standard and need not be specified. In addition, specify 9 Track NRZI (#5310) or 7 Track NRZI (#6320) if required ... see "Special Features."

[4] If a tape switching configuration is being ordered, the 3803 must be equipped with a Communicator (#9071 or #9073) ... see table under "Tape Switching" below. If a Communicator feature is ordered for a 3803 without a switching feature, no tape units can be signal attached to that control unit.

[5] Auxiliary AC Power Supply: #9001. Required to power more than six 3420 mdl 8s from one 3803 mdl 2. Also may be required to power 3420 mdl 8s in combination with other drives ... see "Limitations" above. Requires a 100 amp power source.



3803 Tape Control Model 2 (cont'd)

PRICES: Mdl	MAC/ MRC	FTP/ MLC		ETP/ MLC	Purchase	MMMC
		1 yr*	2 yr	2 yr		
3803 2	\$1,101	\$1,013	\$925	\$925	\$39,420	\$150

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Assignable Unit Warranty: B Maintenance: A
 Purchase Option: 55% Useful Life Category: 2 Per Call: 3
 Model/Feature Additional Charge in lieu of AU Charge: 10%
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%

* FTP is 12-23 months.

ETP/FTP/MLC: ETP, FTP and MLC are optionally available. Customers can transfer to ETP/MLC when the 3803 mdl 1 is converted to a mdl 2 or when 3420s are model changed or at any time thereafter. The early termination charge does not apply but the two year ETP/MLC commitment period begins at the date of the ETP/MLC contract, not the FTP/MLC contract.

3420s and 3803s shipped from the plant may be under ETP/MLC, FTP/MLC or MAC/MRC at the customer's option.

Model Changes: A 3803 mdl 1 can be converted to a 3803 mdl 2 in the field.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model 1 to Model 2 -- \$15,750 **

** Customer price quotations and customer order acknowledgement letters for Purchase must state: "Installation of this model change involves the removal of parts which become the property of IBM."

SPECIAL FEATURES

9 TRACK NRZI (#5310). Required for attachment of 3420 mdls 3, 5 or 7 equipped with Dual Density (#3550). Allows attached tape drives to read and write data in 9-track - 800 bpi format as well as 1600 bpi (Phase Encoded) format. **Field Installation:** Yes.

REMOTE SWITCH ATTACHMENT (#6148). Provides for remote operation of the Two Channel Switch (#8100) on the 3803 mdl 2, from a remote console such as the configuration control panel (3058 or 3068) for a S/370 mdl 158 MP or 168 MP. Operation of the switch on the remote console will result in the same function as operation of the 3803 switch. The 3803 switches will be functionally inoperative when this feature is installed. The cable to the remote console is not provided by this feature. The cable used must contain three wires for each Enable/Disable switch to be installed. Each line must have a total loop resistance of less than 75 ohms when the remote switch completes the path. For operation with the 2925 mdl 10, 3058 or 3068, cable P/N 5351178 is required and should be ordered as a separate **Field Installation:** Yes.

7 TRACK NRZI (#6320). Required for attachment of 3420 mdls 3, 5 or 7 equipped with Seven Track (#6407). Allows attached tape drives to read and write data in 7-track/200, 556 or 800 bpi format. **Field Installation:** Yes. **Prerequisite:** 9 Track NRZI (#5310).

TWO CHANNEL SWITCH (#8100). Permits connection of the 3803 to a second channel. Alternate path switching between two channels on the same system is under program control. Partitioning of attached tape units between channels on two different systems can be done using current procedures for logical device partitioning. The procedures involve the proper use of the operator commands VARY ONLINE/VARY OFFLINE (OS) or DVCDN/DVCUP (DOS).

TAPE SWITCHING (#1792 - 1794). Switching configurations, via two, three or four control units, are available to provide access to:
 (a) Up to eight tape units attached to a single control unit.
 (b) Up to sixteen tape units, with eight attached to each of two control units.

All switchable tape units must be signal attached to the control units equipped with the switching features (2-Control Switch, 3-Control Switch, or 4-Control Switch). Each control unit must be equipped with appropriate density feature for any drive in the pool to which it has access. **Field Installation:** Yes.

The table below indicates features required for the available switching options.

Switching Options	Features Required	Feature Numbers			
		On 1st 3803	On 2nd 3803	On 3rd 3803	On 4th 3803
2 x 8	Communicator 1-2	9071	9071	--	--
	2-Control Switch	1792	--	--	--
3 x 8	Communicator 1-2	9071	9071	9071	--
	3-Control Switch	1793	--	--	--
4 x 8	Communicator 1-2	9071	9071	9071	9071
	4-Control Switch	1794	--	--	--
2 x 16	Communicator 1-2	9071	9071	--	--
	2-Control Switch	1792	1792	--	--
3 x 16	Communicator 1-2	9071	9071	--	--
	Communicator 3-4	--	--	9073	--
	3-Control Switch	1793	1793	--	--
4 x 16	Communicator 1-2	9071	9071	--	--
	Communicator 3-4	--	--	9073	9073
	4-Control Switch	1794	1794	--	--

Special Feature Prices:	FTP/		ETP/		Purchase	MMMC
	MRC	1 yr*2 yr	MLC	MLC		

Tape Switching	2-Cntrl Switch	#1792	\$223	\$205	\$187	\$187	\$ 7,020	\$11.00
3-Cntrl Switch	1793	286	263	240	240	8,955	17.50	
4-Cntrl Switch	1794	335	308	281	281	10,530	17.50	
9 Track NRZI	5310	110	101	92	92	3,530	1.50	
Remote Sw Attac	6148	33	30	28	28	1,045	NC	
7 Track NRZI	6320	54	50	45	45	1,735	1.50	
Two Chnl Switch	8100	166	153	139	139	5,265	5.50	

* FTP is 12-23 months.

IBM 3803 TAPE CONTROL - MODEL 3

Purpose: Control unit for attaching 3420 Magnetic Tape Units mdls 3 and 5 to S/370 mdls 115 and 125.

Highlights: Single channel control for up to eight 3420 tape units. Features are offered to provide performance at 556 and 800 bpi in the seven track NRZI format or at 800 bpi in the nine track NRZI format or at 1600 bpi phase encoded.

The following table indicates feature numbers for corresponding functions:

Subsystem Function	Feature Name	3420 Tape Unit	3803 Control Unit
1600 bpi PE 9-track only	Single Density	#6631	#9570
1600 bpi PE/800 bpi NRZI 9-track	Dual Density	#3550	#3551
1600 bpi PE/556-800 bpi NRZI 7-track	Seven Track	#6407*	#6408

* Tape unit will only read or write 7-track tape.

PREREQUISITES: The Magnetic Tape Adapter feature (#4675) and Specify feature (#9807) on S/370 mdl 115 or 125.

Limitations: Attachable to S/370 mdl 115 and 125 only. 3420 mdls 4, 6, 7 or 8 cannot be addressed through a 3803 mdl 3.

Bibliography: GC20-0001.

SPECIFY: [1] Either Dual Density (#3551) or Seven Track (#6408) must be ordered unless Single Density (#9570) is specified. Only one of the three features can be installed.

[2] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES: Mdl	MAC/ MRC	FTP/ MLC		ETP/ MLC	Purchase	MMMC
		1 yr*2 yr	2 yr	2 yr		
3803 3	\$817	\$752	\$686	\$686	\$24,600	\$137

Plan Offering: Plan A, Additional Use Charge Rate: 10%
 Metering: Assignable Unit Warranty: B Maintenance: A
 Purchase Option: 55% Useful Life Category: 2 Per Call: 3
 Model/Feature Additional Charge in lieu of AU Charge: 10%
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%

* FTP is 12-23 months.



3803 Tape Control Model 3 (cont'd)

ETP/FTP/MLC ... all models of the 3803 may be under ETP/MLC or FTP/MLC.

Model Changes: A 3803 mdl 1 may be converted to a 3803 mdl 3 in the field. Field conversion of a 3803 mdl 2 to a 3803 mdl 3 or a 3803 mdl 3 to a 3803 mdl 2 is not available. On field converting a purchased 3803 mdl 1 to a 3803 mdl 3, features #9071, #9073, #1792, #1793, #1794, #6148 and #8100 if installed on the 3803 mdl 1 must be removed at customer's expense.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 1 to Model 3 \$8,900

DUAL DENSITY (#3551). Provides for the attachment of tape units equipped with Dual Density (#3550) to read and write tapes at either 1600 bpi PE or 800 bpi NRZI nine track. Tape units equipped with Single Density (#6631) can also be attached. Limitation: Dual Density (#3551) cannot be installed in the same control unit with either Single Density (#9570) or Seven Track (#6408). Field Installation: Yes.

SEVEN TRACK (#6408). Provides for the attachment of tape units equipped with Seven Track (#6407) to read and write tapes at either 556 or 800 bpi in the 7-track format compatible with tapes written by 729, 7330, 7335 and 2400 series tape units equipped with 7-track read/write heads. Includes the translator function, which, when used, causes 8-bit bytes from the I/O interface to be written on tape as 6-bit BCD characters and 6-bit BCD characters read from tape to be translated into their EBCDIC equivalents. The Data Conversion function, also included, allows reading and writing of 8-bit bytes on 7-track tape by converting four tape characters into three storage bytes and vice versa. Tape units equipped with Single Density (#6631) can also be attached. Limitation: Cannot be installed in the same control unit with either Single Density (#9570) or Dual Density (#3551). Field Installation: Yes.

Special Feature Prices:	FTP/		ETP/		Purchase	MMMC
	MAC/ MLC	MLC	MLC	MLC		
Dual Density	#3551	\$ 83	\$ 76	\$ 70	\$ 2,630	\$ 3.00
Seven Track	6408	83	76	70	2,630	3.00

* FTP is 12-23 months.

IBM 3811 PRINTER CONTROL UNIT

Purpose: Control unit for the 3211 Printer in a S/360 mdl 22, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195 or any S/370 Processor (except 3115 or 3125, or any 4300 Processor).

Highlights: The 3811 provides the necessary controls for attaching the 3211 Printer to the I/O channels provided by the processing system. It contains all the necessary electronic controls and buffering to adapt the mechanical printer to the channel. The control unit (3811) and the mechanical printer (3211) are physically attached to each other.

The logic, buffers and controls of the Universal Character Set and Forms Control Buffer are located in the 3811.

PREREQUISITES: The 3811 requires a control unit position on a system channel.

S/360 mdl 22, 30, 40, 50 - multiplexer channel (standard), Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 65, 75 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 67 -- basic multiplexer channel of 2870 ... see 2870.

S/360 mdl 85, 195, S/370 mdl 165, 168, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) of 2870, the shared subchannels or non-shared subchannels (non-shared attachment is recommended) of a 2880 Block Multiplexer Channel ... see 2860, 2870, 2880.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channels (special features), block multiplexer channel (special feature) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channel (special feature) ... see 3135-3.

S/370 mdl 138 -- byte multiplexer channel (standard), block

multiplexer channel (standard) ... see 3138.

S/370 mdl 145 -- byte multiplexer channel (standard), Selector Channels, Block Multiplexer Channels (special features) ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), Second Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

3031, 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031, 3032.

3033 -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 -- byte multiplexer channel (special feature), block multiplexer channel (special feature) ... see 4331.

4341 -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.

Bibliography: S/360 -- GC20-0360, S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES:	Mdl	FTP/			Purchase	MMMC
		MAC/ MRC	MLC 1 yr*	MLC 2 yr		
3811	1	\$883	\$812	\$742	\$22,460	\$180

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: I/O Unit (Online) (meter on 3211) Maintenance: A
Purchase Option: 45% Warranty: B Per Call: 3
Useful Life Category: 2 Upper Limit Percent: 0%
Model/Feature Additional Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%

SPECIAL FEATURES

PRINT POSITIONS, 18 ADDITIONAL (#5553). Controls for Print Positions, 18 Additional (#5554) on the 3211 Printer. Field Installation: Yes.

Special Feature Prices:	MAC/ MRC	FTP/		Purchase	MMMC
		MLC 1 yr*	MLC 2 yr		
Print Pos, 18 Add'l #5553	\$22	\$20	\$18	\$752	\$6.50

* FTP is 12-23 months.

IBM 3830 STORAGE CONTROL

Purpose: Control unit for 3330, 3333, 3340, 3344 or 3350 disk storage.

Model 1 Provides for attachment of up to four 3330 modules in any combination of mdl 1 and/or 2. Attaches to S/360 mdl 195 or S/370 mdls 165, 168 or 195 via a 2880 Block Multiplexer Channel. Attachment to the S/370 mdls 135 or 145 is made via the system block multiplexer channel or selector channel and to the 135-3, 138, 145-3 and 148 via the block multiplexer channel. Attachment to S/370 mdls 155 or 158 is made via the system's block multiplexer channel. Attachment to a 3031, 3032, 3033 or 4341 Processor is made via a block multiplexer channel.

Model 2 Provides for the attachment of 3333s (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdl A2s/A2Fs ... see DASD Configuration under "Specify." Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl Bs and/or 3344s to the 3340 mdl A2 or by attaching 3350 mdl Bs and/or a mdl C to the 3350 mdl A2/A2F ... see DASD Configuration under "Specify" and 3330, 3333, 3340, 3344, 3350 "Machines" pages.

Attaches to S/360 mdl 195 or S/370 mdls 165, 168 or 195 via a 2880 Block Multiplexer Channel. Attachment to S/370 mdl 135 (see "Limitations") or 145 is made via the system's block multiplexer channel or selector channel and to the 135-3, 138, 145-3 and 148 via the block multiplexer channel. Attachment to S/370 mdl 155 or 158 is made via the system's block multiplexer channel. Attachment to a 3031, 3032, 3033 or 4341 Processor is made via a block multiplexer channel.

Highlights: File organization and format are under program control ... command structure permits flexible and efficient processing of either randomly or sequentially organized files. Data integrity is provided through extensive error detection and correction capabilities.

Standard Features ... include the following:

Command Chaining - allows sequential records within a cylinder to be read/written by a sequence of channel commands without rotational delays between records.

Record Overflow - storage efficiency is obtained by allowing records to span track boundaries within a cylinder.

PREREQUISITES: [1] The 3830 mdl 1 is designed for interconnected operation with 3330 Disk Storages. Customers who wish to order a 3830 mdl 1 for stand-alone or individual use should submit an RPQ to provide the necessary safety elements (covers, cable connectors, etc.) to complete the unit for a non-standard (i.e., not interconnected as part of a 3330 facility) environment. In lieu of the RPQ, the customer may provide safety elements equivalent to the standard 3830 mdl 1/3330 configuration or that provided by the RPQ. If not provided, the unit will be offered on a purchase only basis. See item [3] under "Specify." Agreement for IBM to install and maintain the 3830 mdl 1 in any non-standard environment must be reviewed

[2] An available control unit position on a channel. One unshared subchannel for each drive attached on a system block multiplexer channel or a 2880 Block Multiplexer Channel. For S/370 mdls 135 and 145, a system block multiplexer channel is required for support of block multiplexing and rotational position sensing ... see 3333, 3330, 3340, 3344 and 3350. If this support is not required, attachment to a system selector channel is permitted.

Limitations: [1] See 3333, 3330, 3340, 3344 and 3350 for system support limitations ... [2] In S/370 mdl 135, 135-3, 138, when a 3830 mdl 2 is attached to a block multiplexer channel, only 16 logical devices will operate in this mode even if more than 16 logical devices are attached.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with 3330, 3333 or 3340 voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Non-standard Environment: #9485 ... must be specified if the 3830 mdl 1 is not to be installed as part of a 3330 facility. Also see "Prerequisites" above.

† No longer available.

[4] DASD Configuration (3830 mdl 2 only): The available combinations of storage devices which can be attached are shown in the tables below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required DASD Specify Features" are installed.

Based on the DASD, and the Special Features listed below being ordered for them, order the Required DASD Specify Feature(s) from the appropriate table.

3830 MODEL 2 WITH OR WITHOUT TWO CHANNEL SWITCH (#8170)

DASD Configuration	Required DASD Specify Features *						
	9313 †	9314 †	9314 † 9190 †	9315 †	9315 † 9190 †	9317 †	9318 †
3333 Only	One or two 3333s with associated 3330s	x	x				
	Up to four 3333s with associated 3330s			xx			
	String Switch (8150) on any 3333	x			x		
3340 Only	One or two 3340 mdl A2s with associated mdl B1/B2s		x	x	x		
	Up to four 3340 mdl A2s with associated mdl B1/B2s				x	x	
	String Switch (8150) on any 3340 mdl A2		x		x	x	
3340/3344	Fixed Head Feature (4301/4302) on any 3340			x	x	x	
	Up to four 3340 mdl A2s of which up to two may attach 3344s						x
	String Switch (8150) on any 3340 mdl A2 and/or Fixed Head Feature on any 3340 (4301/4302)						x
3333/3340 (not 3344)	3333s and 3340 mdl A2s (any combination of two, three, or four) each with associated drives				x	x	x
	String Switch (8150) on any 3333 or 3340 mdl A2				x		x
	Fixed Head Feature (4301/4302) on any 3340					x	x
3350 Only	Up to four 3350 mdl A2s/A2Fs w associated mdl B2s/B2Fs, C2/C2F						x
	String Sw (8150) on any 3350 mdl A2/A2F,C2/C2F						x
3333/3340/3350 (not 3344)	3333s, 3340 mdl A2s and 3350 mdl A2s/A2Fs (any combination of 2, 3 or 4) with associated drives						x
	String Sw (8150) on any 3333, 3340 mdl A2, or 3350 mdl A2/A2F,C2/C2F and/or Fixed Head Feature (4301/4302) on any 3340						x

Notes:

† ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on the same diskette.

* Any change to an installed DASD Configuration requires an MES ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed. AND removal of any not listed as required for the new configuration.

** Control Store Extension (#2150) is prerequisite. With #9315, the 3830 mdl 2 requires 32 contiguous device addresses regardless of the number of drives attached.

+ Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the 3830-2 uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 mdl A2s on the first and third strings may attach up to three 3340 mdl B1, B2s, and/or 3344s in any combination. The 3340 mdl A2 on the second string may attach up to three 3340 mdl B1/B2s. The 3340 mdl A2 on the fourth string may attach one 3340 mdl B1 or B2.

++ Expanded Control Store (#2151), Control Store Expansion (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the 3830-2 uses 8 or 16 or 32 or 64 device addresses depending upon the DASD configuration installed and whether any 3350 drive is in 3330-1 compatibility mode.

3830 Storage Control (cont'd)
3830 MODEL 2 WITH TWO CHANNEL SWITCH, ADD'L (#8171)
AND ITS PREREQUISITE TWO CHANNEL SWITCH (#8170)

DASD Configuration		Required DASD Specify Features *				
		9313 †	** 9313† 9841†	** 9315	+ 9317 †	++ 9318 †
3333 only	One or two 3333s with associated 3330s	x	x			
	Up to four 3333s with associated 3330s			x x		
	String Switch (8150) on any 3333		x	x		
3340 only	One or two 3340 mdl A2s with associated mdl B1/B2s			x x		
	Up to four 3340 mdl A2s with associated mdl B1/B2s				x x	
	String Switch (8150) on any 3340 mdl A2			x x		
3340/3344	Up to four 3340 mdl A2s of which up to two may attach 3344s				x x	
	String Switch (8150) on any 3340 mdl A2 and/or Fixed Head Feature on any 3340 (4301/4302)					x
	3333s and 3340 mdl A2s (any combination of 2, 3 or 4) each with associated drives				x x	
3333/3340 (incl 3344)	String Switch (8150) on any 3333 or 3340 mdl A2				x	
	Up to four 3350 mdl A2s/A2Fs w associated mdl B2s/B2Fs, C2/C2F					x x
	String Sw (8150) on any 3350 mdl A2/A2F, C2/C2F					x
3333/3340/3350 (incl 3344)	3333s, 3340 mdl A2s and 3350 mdl A2s/A2Fs (any combination of 2, 3 or 4) with associated drives					x x
	String Sw (8150) on any 3333, 3340 mdl A2 or 3350 mdl A2/A2F, C2/C2F and/or Fixed Head Feature (4301/4302) on any 3340					x

NOTE: For explanation of *, **, +, ++ and †, see Notes following the Table "3830 Model 2 with or Without Two Channel Switch (#8170)"

PRICES:	Mdl	MAC/ MRC\$	ETP/ MLC 2 yr\$	Purchase	MMMC	
	3830	† 1	\$2,055	N/A (a)	\$56,270	\$159
		2	1,740	\$1,462 (b)	47,580	126

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Assignable Unit Warranty: B Machine Group: D
Purchase Option: 60% Useful Life Category: 1 Per Call: 3
Model/Feature Additional Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Model 1 can be field changed to Model 2. An additional 15 amp AC power outlet is required. The 3830 mdl 2 to mdl 1 is not recommended for field installation.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 1 to Model 2\$7,140

SPECIAL FEATURES

††CONTROL STORE EXTENSION (#2150). [Model 2 only] Provides additional control store for microprogram use ... see DASD Configuration under "Specify" to determine when required. **Field Installation:** Yes. **Maximum:** One.

††EXPANDED CONTROL STORE (#2151). [Model 2 only] Provides additional control storage for microprogram use ... see DASD Configuration under "Specify" to determine when required. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Control Store Extension (#2150).

††REGISTER EXPANSION (#6111). [Model 2 only] Provides additional registers for microprogram use ... see DASD configuration under "Specify" to determine when required. **Field Installation:** Yes. **Maximum:** One.

REMOTE SWITCH ATTACHMENT (#6148). [Model 2 only] To attach the Two Channel Switch (#8170) to a configuration control panel. **Field Installation:** Yes.

† No longer available.

††† When ordering this feature for field installation, a Specify Feature must also be ordered ... see "Notes" under DASD Configuration Charts above to determine which is required.

REMOTE SWITCH ATTACHMENT, ADD'L (#6149). [Model 2 only] To attach the Two Channel Switch, Add'l (#8171) to a configuration control panel. **Field Installation:** Yes.

TWO CHANNEL SWITCH (#8170). To attach the 3830 to a second channel ... the two channels may be on the same Processor or different Processors. An available control unit position is required on each channel ... see item [2] under "Prerequisites." Switching is under program control. The 3830 can be dedicated to a single channel by means of an Enable/Disable switch. **Field Installation:** Yes. **Maximum:** One.

TWO CHANNEL SWITCH, ADD'L (#8171). Adds switching for two additional channels to a 3830 with Two Channel Switch (#8170), providing four channel switch capability. **Limitation:** Only two channels of the four available can be attached to the same Processor. Cannot be installed if Fixed Head Feature (#4301/4302) is installed on any 3340. **Field Installation:** Yes. **Maximum:** One. **Prerequisites:** Two Channel Switch (#8170). Expanded Control Store (#2151) and/or Control Store Extension (#2150) are also required in certain 3830 mdl 2 configurations ... see DASD Configuration under "Specify."

Special Feature Prices:		ETP/ MAC/ MRC\$ 2 yr	Purchase	MMMC
Control Store Extn	#2150*	\$402 \$338 (c)	\$11,000	\$10.50
Expd Cntrl Store	#2151*	247 207 (a)	6,730	10.50
Register Expansion	#6111*	24 20 (f)	640	4.00
Remote Switch Attach	#6148	NC NC	NC	NC
Rem Sw Attach, Add'l	#6149	NC NC	NC	NC
Two Channel Switch	#8170	171 144 (d)	4,690	10.50
Two Channel Sw, Add'l	#8171	171 144 (d)	4,690	10.50

* Feature supplies ISC diskette.

§ Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this feature involves the removal of parts which become the property of IBM."

- (a) ETP not available for mdl 1. FTP/MLC available for mdl 1 - 12-23 months = \$1,891\$... 24 months = \$1,726\$.
- (b) FTP/MLC also available - 12-23 months = \$1,601\$... 24 months = \$1,462\$.
- (c) FTP/MLC also available if 3830 on FTP/MLC. 12-23 months = \$370\$... 24 months = \$338\$.
- (d) ETP available for model 2 only. FTP/MLC available for both models - FTP/MLC for #8170 or #8171 - 12-23 months = \$157\$... 24 months = \$144\$.
- (e) FTP/MLC also available - 12-23 mos. = \$227\$... 24 mos. = \$207\$.
- (f) FTP/MLC also available - 12-23 mos. = \$ 22\$... 24 mos. = \$ 20\$.

§ MAC/MRC, ETP/MLC and FTP/MLC prices effective 6/1/79.

IBM 3830 STORAGE CONTROL - Model 3

Purpose: Provides for the attachment of 3333/3330/3350 DASD in a 3850 Mass Storage System.

Highlights:

Virtual Disk Storage - provides up to 64 unique addresses for each channel interface.

Channel Interfaces - up to three Processor channel interfaces are available, providing up to 192 unique addresses on each 3830 mdl 3.

Drives - up to 32 DASD spindles of 3333/3330 Models 1, 2 and 11 and 3350 mdls A2/A2F, B2/B2F and C2/C2F can be attached. A 3830 mdl 3 with feature #9320 can operate any combination of up to four 3333 mdls 1 and 11 with associated 3330 mdls 1, 2 and 11 and/or native 3350 mdls A2/A2F with associated native 3350 mdls B2/B2F and C2/C2F. A 3830 mdl 3 with feature #6250 can operate up to four 3350 mdls A2/A2F with associated 3350 mdls B2/B2F and C2/C2F in either native or 3330-11 mode. See 3333, 3330 and 3350 for additional information.

Staging Drives - up to sixteen 3333 mdl 1/3330 mdl 1 or 2 storage devices can be designated as staging drives. 3333/3330 mdl 11 or 3350 in 3330 mdl 11 mode may also be used for staging drives, however each 3333/3330 mdl 11 or 3350 in mdl 11 mode drive designated as a staging drive is equivalent to two mdl 1 or mdl 2 drives. These staging drives will be used by the 3850 Mass Storage System to provide virtual storage. See note



3830 Storage Control (cont'd)

on M3333 pages for feature changes required when 3333's are retained for use with a 3851.

Staging Paths - the 3830 mdl 3 contains control storage for data buffering and microcode. This accomplishes data staging without utilizing S/370 or 4341 Processor channels or memory.

Real Drives - up to a maximum of 32 attached drives may be designated as real. Each real drive uses one of the 192 unique 3830 addresses. All 3350 drives attached to a 3830 Mdl 3 with feature #9320 must be designated as real in 3350 native mode only. 3350 drives attached to a 3830 mdl 3 with feature #6250 may be designated as real in 3350 native or 3330 mdl 11 mode.

Virtual Storage - all data stored in the 3850 Mass Storage System appears to the system as residing on a 3333/3330 storage device with all the data handling capabilities of the 3330 available.

PREREQUISITES: The 3830 mdl 3 must have the Two Channel Switch (#8170) and Control Store Extension (#2150). One channel interface attaches to the 3851 MSF and one channel interface attaches to the host Processor.

Limitations:

- [1] A maximum of four 3830 mdl 3s may be attached to a S/370 or 4341 block multiplexer channel. If 3830 mdl 1s or 2s and/or Integrated Storage Controls (#4650) are attached to the same block multiplexer channel, the maximum number of 3830 mdl 3s will be reduced. Consult IBM 3850 Mass Storage (MSS) Installation Planning and Table Create, GC35-0028 for total system limitations.
- [2] String Switch (#8150) may be installed on the 3333/3350 in a 3850 MSS for additional availability. Installation is not recommended in a mixed MSS/Non-MSS environment. See 3333/3350 for additional limitations.
- [3] 3340 DASD cannot be installed on the 3830 Mdl 3.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with 3333/3330 voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] DASD Designation: #9313§ for 3333/3330 DASD, or #9320§ for 3333/3330/3350 DASD.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
	3830	3	\$3,370	\$2,831(a)	\$92,160 \$235

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Assignable Unit Warranty: B Machine Group: A
Purchase Option: 60% Useful Life Category: 1 Per Call: 3
Model/Feature Additional Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

(a) FTP/MLC also available - 12-23 months = \$3,100\$...
24 months = \$2,831\$.

Model Changes: 3830 mdl 2 can be field changed to a mdl 3. MES order for model change must include correct serial number and all installed and on order features and RPQs on the 3830 mdl 2 to be changed. It must also include removal of any of the following which are installed: #9190, #9314, #9315, #9317, #9318, #9841. Prior to ordering the model change, installed and on-order RPQs should be resubmitted.

Control Store Extension (#2150) and Two Channel Switch (#8170) must be previously installed or installed concurrently with the model upgrade. For customers who wish to have an installed 3830 mdl 1 converted directly to a 3830 mdl 3, submit an RPQ.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 2 to Model 3 \$44,580.

** Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model upgrade involves the removal of parts which become the property of IBM."

SPECIAL FEATURES

CONTROL STORE EXTENSION (#2150). [Req'd on mdl 3] Provides additional control store for microprogram use. **Field Installation:** Yes.

EXPANDED CONTROL STORE (#2151). Provides additional con-

§ ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

trol store for microprogram use. Required if 3350 DASD is attached. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Control Store Extension (#2150).

CONTROL STORE ADDITIONAL (#2152) Provides additional control store for microprogram use. Required if 3350 DASD is attached. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Control Store Extension (#2150), Register Expansion (#6111), and Expanded Control Store (#2151).

REGISTER EXPANSION (#6111) Provides additional registers for microprogram use. Required if 3350 DASD is attached. **Field Installation:** Yes. **Maximum:** One.

REMOTE SWITCH ATTACHMENT (#6148). To attach the Two Channel Switch (#8170) to a configuration panel. **Maximum:** One. **Field Installation:** Yes.

REMOTE SWITCH ATTACHMENT, ADD'I (#6149). To attach the Two Channel Switch, Add'I (#8171) to a configuration panel. **Maximum:** One. **Field Installation:** yes. **Prerequisite:** Remote Switch Attachment (#6148).

3350 STAGING (#6250). Provides for staging to 3350 drives in 3330 mdl 11 mode and access to Real 3350 in either native or 3330 mdl 11 mode. **Limitation:** Attachment of 3333 mdls 1/11, 3330 mdls 1, 2 or 11 is mutually exclusive with this feature. **Maximum:** One **Field Installation:** Yes **Prerequisites:** Control Store Additional (#2152) and Register Expansion (#6111).

TWO CHANNEL SWITCH (#8170). [req'd on mdl 3] Provides system channel attachment capability for the 3830 mdl 3. One channel interface attaches to the 3851 MSF and one channel interface attaches to the host Processor. An available control unit position is required. See "Prerequisites" and "Limitations." **Field Installation:** Yes.

TWO CHANNEL SWITCH, ADD'L (#8171). Provides attachment for two additional channels to a 3830 mdl 3, providing three Processor channel switch capability. **Limitation:** Only two of the three channel interfaces available can be attached to channels on the same Processor. **Maximum:** One, see "Prerequisites" and "Limitations." **Field Installation:** Yes. **Prerequisite:** Two Channel Switch (#8170).

Special Feature Prices:	ETP/ MAC/ MLC\$ MRC\$ 2 yr (b) Purchase MMMC			
	Control Store Extension	#2150*	\$402	\$338	$11,000 $10.50
Expanded Control Store	2151*	247	207	6,730 10.50
Control Store Additional	2152*	247	207	6,730 10.50
Register Expansion	6111*	24	20	640 4.00
Remote Switch Attach	6148	NC	NC	NC NC
Remote Sw Attach, Add'l	6149	NC	NC	NC NC
3350 Staging	6250*	NC	NC	NC NC
Two Channel Switch	8170	171	144	4,690 10.50
Two Channel Sw, Add'l	8171	171	144	4,690 10.50

- (b) FTP/MLC also available if 3830 on FTP/MLC
 - #2150 - 12-23 months = \$370\$... 24 months = \$338\$.
 - #2151 - 12-23 months = \$227\$... 24 months = \$207\$.
 - #2152 - 12-23 months = \$227\$... 24 months = \$207\$.
 - #6111 - 12-23 months = \$ 22\$... 24 months = \$ 20\$.
 - #8170 - 12-23 months = \$157\$... 24 months = \$144\$.
 - #8171 - 12-23 months = \$157\$... 24 months = \$144\$.

* Feature supplies ISC diskette.

§ MAC/MRC, ETP/MLC, and FTP/MLC prices effective 6/1/79.

**IBM 3838 ARRAY PROCESSOR**

Purpose: An auxiliary processing unit for S/370 mdl 145, 148, 158, 168 and a 3031, 3032, 3033 or 4341 Processor which attaches on a block multiplexer channel. Processes single precision floating point vector operations found in seismic trace processing and other applications.

Model 1 Contains 256K bytes of bulk storage.

Model 2 Contains 512K bytes of bulk storage.

Model 3 Contains 1,024K bytes of bulk storage.

Highlights: Permits systems with a high content of vector processing operations to execute the vector work in parallel with CPU host processing thereby releasing the CPU for other multiprogrammed system tasks. User programmable by coding available instructions to define complete processing sequences. Contains five functional components each capable of overlapped or concurrent operation to sustain processing performance.

Channel Interface -- allows data and control information to transfer in block multiplexer mode at data rates up to 1.5 MB, or when attached to a S/370 mdl 168 or a 3032 or 3033 Processor, at data rates up to 3.0 MB with the two-byte interface feature in conjunction with the 2880 equipped with a similar feature (#7850 or #7851) or on the 3032 or 3033, when the channel to which it is attached is equipped with a similar feature (#7850).

Bulk Storage -- provides independent data storage for up to seven concurrent 3838 users ... seven is the upper limit on 3838 user partitions but is not restrictive of the number of host regions executing 3838 destined jobs. The user partitions may be shared or exclusive ... receives input data from the host and buffers for processing ... during processing of algorithm sequences, provides initial, intermediate, and final result data storage. Final results are subsequently transmitted to the host under control of a pending CCW on the block multiplexer channel.

Data Transfer Controller -- provides multiplexing of the internal data buses for concurrent transfers of data between the functional elements.

Arithmetic Processor -- controls algorithm execution for processing vectors through the 100ns/stage pipelined arithmetic unit ... algorithms can be utilized in the application program of individual users to provide comprehensive processing techniques unique to each user. Algorithm control store may be expanded from the basic 16,384 bytes for all models with the control store additional feature (#1551) which provides an additional 16,384 bytes of control storage.

Control Processor -- manages the total 3838 subsystem functional operation, synchronizing all data transfers and arithmetic operations, performing logical decisions in algorithm chains, and sequencing multiple users problems through the array processor.

The Instruction Set includes the following vector processing algorithm and logic operations:

Algorithm/Mnemonic

a) ARITHMETIC INSTRUCTIONS (standard)

Vector Move (VMV)
 Vector Move Convert (VMC)
 Scalar Move (SMV)
 Zero Move (ZMV)
 Vector Floating Point to Fixed Point Conversion (VFX)
 Convolving Multiply (CVM)
 Quadratic Interpolation (INT)
 Vector Element-by-Element Sum (VES)
 Scalar Element-by-Element Sum (SSUM)
 Vector Element-by-Element Multiply (VEM)
 Scalar Multiply (SMY)
 Sum of Squares (SSQ)
 Fast Fourier Transform (Forward Real) (FTFR)
 Fast Fourier Transform (Forward Complex) (FTFC)
 Fast Fourier Transform (Inverse Real) (IFTR)
 Fast Fourier Transform (Inverse Complex) (IFTC)
 Complex Multiply (CEM)
 Scalar Complex Multiply (SCEM)
 Complex Multiply (Complex Conjugate) (CMCC)
 Complex Multiply (Conjugate Output) (CMCO)
 Scalar Complex Multiply (Conjugate Output) (SCMO)
 Signed Square Array (SSA)
 Sum of Vector Elements (SVE)
 Array Scan for Maximum (MAX)
 Vector Inner Product (VIP)
 Vector Element Limit (LIM)
 Divide (DIV)
 Scalar Divide (SDIV)
 Square Root (SQRT)
 Nth Zero Crossing (NZCP/NZCN)
 Wiener-Levinson (WLEV)

ARITHMETIC INSTRUCTIONS (optional)

Polynomial Expansion (POLY) (#9301)
 Logarithm (LOG) (#9302)
 Exponential (EXP) (#9303)
 Tangent (TAN) (#9304)
 Arctangent (ATAN/ATN2) (#9305)
 Recursive Filter (REC) (#9307)
 Vector Reverse (REV) (#9308)

b) LOGIC/INDEX INSTRUCTIONS

Move Index to Index (XMV)
 Move Bulk Storage to Index (XMVS)
 Move Index to Bulk Storage (XMVB)
 Move Immediate to Index (XMVI)
 Add Index to Index (XAD)
 Add Immediate to Index (XADI)
 Subtract Index from Index (XXSB)
 Subtract Immediate From Index (XSBI)
 Multiply Index times Index (XML)
 Multiply Immediate times Index (XMLI)
 Divide Index into Index (XDV)
 Divide Immediate into Index (SDVI)
 Divide Index into Immediate (XDIR)
 Compare Index : Index (SC)
 Decrement and Compare Index : Index (XDC)
 Compare Floating Point Index : Index (XCF)
 Compare Floating Point Index : Immediate (XCFI)
 Compare Index : Immediate (XCI)
 Decrement and Compare Index : Immediate (XDCI)
 Branch on Count Loop (XBCT)
 Unconditional Branch (XGO)

c) VPSS INSTRUCTIONS

Label Definition (XID)
 Move Data to/from S/370 or 4341 Processor and 3838 Bulk Storage (VPUT/VGET)
 Move Data to/from S/370 or 4341 Processor and 3838 Index (VPUTX/VGETX)

A brief description of the vector processing algorithm follows:

Vector Element Sum (VES) The VES operation provides a resultant vector Y, the elements of which are a sum of the corresponding elements in vector X and vector or scalar U.

Vector Element Multiply (VEM), Scalar Multiply (SMY), or Signed Square Array (SSA) The VEM operation provides a resultant vector Y, the elements of which are a product of the corresponding elements in vectors X and U. The SMY operation is a special case of VEM for which U is a scalar quantity. The SSA operation uses the VEM algorithm with two specifications of the X array as the inputs. A sign control option exercised on the first call of the X array allows the sign of the X array to be retained.

Vector Move Convert (VMC) The VMC operation has four sub-forms, each of which load the Y vector from the X vector. One form (VMV) moves vectors in bulk storage, the second form (VMC) converts the X vector from fixed point integer to floating point, the third form (SMV) is used to load a single value (Scalar) into all locations of the Y vector, and the fourth form (ZMV) is a Scalar load where zero is specified as the Scalar value of X.

Sum of Squares (SSQ) or Vector Inner Product (VIP) The SSQ operation takes a vector X and multiplies it on an element by element basis with a replica of itself. It then performs an algebraic sum of these squared elements and returns the single element result to a single element Y. The VIP operation multiplies on an element by element basis, a vector U by a vector X. It then performs an algebraic sum of the resultant products and generates a single element result, Y.

Vector Floating Point to Fixed Point Conversion (VFX) The VFX operation converts a copy of the floating point vector X into a fixed point format, and stores it in Y.

Sum of Vector Elements (SVE) The SVE operation performs an algebraic sum of the elements of an X vector and places the sum in a single element, Y.

Array Scan for Maximum (MAX) The MAX operation scans the input vector X and returns in the two element Y vector the maximum value (after application of sign control) and the count of which element in X had that value.

Vector Element Limit (LIM) The LIM operation replaces the elements of the input vector X with specified minimum and/or maximum values if the input values exceed specified minimum or maximum limit values.

Convolving Multiply (CVM) Resultant vector Y with elements that are a discrete model correlation of the elements in vectors X and U or, by appropriate transposition and translation of the elements in U or X, convolution may be performed.

Divide (DIV) The DIV operation divides input vector U (or Scalar (SDIV)) by a second input vector X and places the result in output vector Y.



3838 Array Processor (cont'd)

Nth Zero Crossing (NZCP/NZCN) The NZCP/NZCN operation scans an input vector X and returns in the Y vector (1) the count of the element X that represents the Nth time the data transitioned between positive and negative, and (2) the total number of zero crossings. The scan may be in order of increasing index (NZCP) or decreasing index (NZCN).

Quadratic Interpolation (INT) The INT operation performs a table lookup and interpolation function on a table of given data, and a set of indicators into this table. The interpolation calculation is along a parabola drawn two points to the left and one point to the right of the chosen location, except where the chosen location is within the first input interval in which case the interpolation is based on one point to the left and two points to the right of the chosen point.

Complex Multiply (CEM) The CEM operation provides a resultant vector Y with complex elements from input vectors X and U each of which have complex elements. The operation may be specified to perform Complex Multiply (CEM), Scalar Complex Multiply (SCEM), Complex Multiply (Complex Conjugate) (CMCC), Complex Multiply (Conjugate Output) (CMCO) or Scalar Complex Multiply (Conjugate Output) (SCMC).

Square Root (SQRT) The SQRT operation takes the square root of the magnitude of an input vector or scalar X and places the result in output vector or scalar Y.

Wiener-Levinson Filter (WLEV) The WLEV operation accepts as its input a characterization of a signal and the type of noise encountered when reading that signal, and produces as an output the coefficients for a digital filter to remove the noise. These coefficients are chosen to minimize the RMS error in the output of a filter when the input consists of the expected signal, plus noise of the expected type.

Fast Fourier Transform (FFT) The FFT operation performs the forward or inverse Fast Fourier Transform in either of two modes: one where the time domain data is known to be complex (FFTC and IFTC) and one where it is real data (FFTR and IFTR).

Polynomial Expansion (POLY) (#9301) The POLY operation applies up to a 24th order polynomial expansion to the input vector X using coefficients provided in the U vector. **PREREQUISITE:** If Recursive Filter (REC) (#9307) or certain Algorithm Design and Development Service additions have been selected in the standard machine, then Arithmetic Element Control Storage Additional (#1551) is required.

Logarithm (LOG) (#9302) The LOG operation determines the logarithm to the base e of an input vector X. **PREREQUISITES:** POLY (#9301) and Arithmetic Element Storage Additional (#1551).

Exponential (EXP) (#9303) The EXP operation provides the antilog to the base e of an input vector X. **PREREQUISITES:** POLY (#9301) and Arithmetic Element Control Storage Additional (#1551).

Tangent (TAN) (#9304) The TAN operation provides the tangent Y of an input vector X. **PREREQUISITES:** POLY (#9301) and Arithmetic Element Control Storage Additional (#1551).

Arctangent (ATAN), Arctangent 2 (ATN2) (#9305) The ATAN operation provides the arctangent Y of an input vector X. The range of Y is 0 to π (Pi) radians. The alternate version of Arctangent, ATN2, provides the arctangent, Y, of two input vectors, X (X axis) and U (Y axis). The range of Y is 0 to 2π radians. **PREREQUISITES:** POLY (#9301) and Arithmetic Element Control Storage Additional (#1551).

Recursive Filter (REC) (#9307) The REC algorithm implements a first order recursion equation where the elements of Y are a function of: previous values of Y, a Y coefficient vector U, an input vector X, and a scalar coefficient which is the first element of the U vector. **PREREQUISITE:** If Polynomial Expansion (POLY) (#9301) or certain Algorithm Design and Development Service additions have been selected in the standard machine, then Arithmetic Element Control Storage Additional (#1551) is required.

Vector Reverse (REV) (#9308) The REV operation reverses the ordering of real data for an input vector X.

CONTROL STORAGE REQUIREMENTS -- the instruction set available on the 3838 consists of logic operations which are executed in the control processor and vector operations which are executed by the arithmetic processor. The arithmetic processor contains a 16,384 byte reloadable control store which contains the algorithms necessary to accomplish the vector operations. These are loaded when the 3838 is IPL/IMPLed from the host system. Selected arithmetic algorithms from the optional arithmetic instructions may be added to the standard arithmetic instructions or, additional algorithms may be added to the product via the Algorithm Design and Development Service capability. When the capacity of the 16,384 bytes of control store is exceeded it is necessary to add

feature #1551 (Control Storage Additional) ... see Special Features.

Algorithm Prerequisites: Prerequisite machine or specify features for optional algorithms are as follows:

- 1) Vector Reverse (REV) (#9308) and either POLY (#9301) or REC (#9307) can be added to the standard machine.
- 2) Polynomial Expansion (POLY) (#9301) is a prerequisite for LOG (#9302), EXP (#9303), TAN (#9304) and ATAN/ATN2 (#9305).
- 3) Any or all of the remaining optional logarithms (POLY) (#9301) or REC (#9307), LOG (#9302), EXP (#9303), TAN (#9304) and ATAN/ATN2 (#9305) require Arithmetic Element Control Storage Additional (#1551).
- 4) Algorithms provided by the Algorithm Design and Development Service may or may not require Arithmetic Element Control Storage Additional (#1551) depending upon complexity or optional algorithm selections.

PREREQUISITES: (1) A control unit position on a system block multiplexer channel ... (2) For S/370 mdl 168 configuration, if Two Byte Interface (#7850) is specified the 2880 must also have the appropriate Two Byte Interface (#7850 or #7851) ... (3) For S/370 mdl 145, Word Buffer Feature (#8810) is required on the 3145 to achieve maximum rated block multiplexer transfer rate ... (4) For a 3032 or 3033 Processor configuration if Two Byte Interface (#7850) is specified, the 3032 or 3033 channel to which the 3838 is to be attached must also have the appropriate Two Byte Interface (#7850).

Limitations: Multiple 3838s and/or other devices on the same channel may degrade performance. The 3838 is supported on S/370 mdls 145, 148, 158, 168 and a 4341 Processor with OS/VS1 and mdls 158 and 168 with OS/VS2 MVS. Multiple 3838 Array Processors attached to a single S/370 or 4341 host, should each have identical algorithm sets because VPSS allocates ports based only on bulk store partition size and shared versus exclusive usage.

Minimum System Requirements:

1. S/370 mdl 145, 148, 158, 168 or 3031, 3032, 3033, or 4341 Processor with block multiplexer channel.
2. Nine track, 1600 BPI P.E. magnetic tape (factory order note specifying type and density, if other).
3. OS/VS2 (MVS) Release 3.7 and Selectable Units for Scheduler (SU4), Supervisor 1 (SU5), Supervisor 2 (SU7), Scheduler/IOS Support (SU16), EREP (SU27), 3838 Vector Processing Subsystem Support (SU29) plus Vector Processing Subsystem (VPSS) Independent Release (IR) and Job Entry Subsystem 2 (SU3) or Job Entry Subsystem 3 (SU12) and Job Entry Subsystem 3 MSS Support (SU18) or OS/VS1 Release 6 with Selectable Unit for Subsystem Attachment Support (SU6), and EREP (SU1).

FE maintenance and service capability is affected if any of the above are NOT part of the system configuration.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage. **FIELD INSTALLATION:** Yes.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white. **FIELD INSTALLATION:** Yes.

[3] Cabling: #9080 for below floor, or #9081 for on the floor. **FIELD INSTALLATION:** Yes.

[4] Configuration: #9092 for additional 3838s in configuration (excludes first unit).

- [5] Specify: #9301 for Polynomial Expansion
#9302 for Logarithm
#9303 for Exponential
#9304 for Tangent
#9305 for Arctangent, Arctangent 2
#9307 for Recursive Filter
#9308 for Vector Reverse

PRICES: Mdl	MAC/ MRC	TLP/ MLC 4 yr	Purchase	MMMC
3838	1	\$17,875	\$16,250	\$ 780,000 \$1,725
	2	21,725	19,750	864,000 2,080
	3	29,425	26,750	1,032,000 2,790

Plan Offering: Plan B Warranty: A Maintenance: D
Purchase Option: 60% * Useful Life Category: 2 Per Call: 3
Termination Charge Months: 6 Termination Charge Percent: 25%
Upper Limit Percent: 5%



DP Machines

M 3838.3
May 79

3838 Array Processor (cont'd)

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From	to	Model 2	Model 3
Model 1		\$84,000	\$252,000
Model 2			168,000

SPECIAL FEATURES

ARITHMETIC ELEMENT CONTROL STORAGE ADDITIONAL (#1551). An additional 16,384 bytes of control store for additional algorithm capabilities. Custom algorithms are requested by Algorithm Design and Development Service. **Maximum:** One. **Field Installation:** Yes.

TWO BYTE INTERFACE (#7850). Provides two byte parallel transfer on the 2880 block multiplexer channel to achieve data transfer rates up to 3.0 MB. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Requires Two Byte Interface (#7850 or #7851) on the 2880, 3032 or 3033.

Special Feature Prices:	MAC/ MRC	TLP/ MLC		Purchase	MMMC
			4 yr		
Arithmetic Element Control					
Storage Add'l	#1551	\$2,420	\$2,200	\$105,600	\$86
Two Byte Interface	7850	220	200	9,600	8

* Purchase option is 50% under Term Lease Plan (TLP).

**3842 LOOP CONTROL UNIT**

Purpose: Used to provide terminal loop capability at locations connected via telecommunications lines to a 3631 or 3632 Plant Communication Controller, or an 8100 System via the data link.

The 3842 controls the operation of a single lobe loop and provides an interface to a common carrier provided voice grade private line (non-switched) channel that is terminated at a 3631, 3632 or 8100 System via an IBM 3872 Modem. Loop and common carrier channel data speed is 2400 bps. The 3842 attaches a loop via a standard loop connector cable furnished with the unit. This cable plugs into a wrap type Loop Station Connector not provided with the 3842.

Highlights:

A 3842 Loop may be up to 3.2 cable kilometers (2 cable miles) in length

All terminals that can attach to a 3631 or 3632 Controller Attached Loop or 8100 System Direct Attached Loop may also attach to a 3842 Data Link Attached Loop.

Controls polling and, with one poll command addressed to it, can provide responses from all loop attached terminals.

Can operate in point-to-point or multipoint mode. Operates in a controlled carrier mode on half duplex or duplex point-to-point, or on 4-wire multipoint facilities.

Switched Network Backup - Manual Answer is offered as an optional feature ... see "Special Features."

Data Rates: 2400 bps with back-up half speed of 1200 bps on both the loop and communication facility.

Problem Determination Aids:

Can execute "On Line" diagnostic commands to perform self tests and to assist in locating loop wiring, terminal, or communication line failures at the remote site.

Can be "Line Tested" with the 3872 Modem at the controller/processor and telecommunication channel independently of the controller/processor.

A Speed Select switch is provided as standard equipment. This allows the 3842 to operate the loop and communications line at half speed.

Offline tests are provided to perform self tests of the 3842 with or without involving loop wiring and/or loop terminals.

Physical Environments: The 3842 Loop Control Unit has been designed for operation in physical environments characteristic of office area. See IBM 3630 Plant Communication System Description Manual, GA24-3652, or Introduction to the 8100 System Manual.

Communication Facilities:

Nonswitched Lines: Communication common carrier provided voice band Private line (non-switched) channel, Type 3002 (or equivalent) as described in the Bell System Technical Reference PUB 41004, dated October, 1973. Duplex (4-wire) required for multi-point and also recommended for point-to-point.

Privately Owned Communication Facilities: Equivalent to the above.

Public Switched Telecommunication Networks: ... see "Special Features." The customer must be advised that satisfactory data transmission depends upon the characteristics of the particular switched network connection being used. See M 2700 pages for further details.

International Facilities: Transmission of data between the United States and Canada on non-switched facilities is supported ... for non-switched operation, the channel in Canada must be a Schedule 4, Type 4.

Attachment to Facilities: Attachment to a private line (non-switched) channel is by a cable, supplied with the 3842 which is terminated with a four prong plug (WE 283B, or equivalent). The plug mates with a receptacle (WE 404B or 549A surface mount or 493A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communication equipment and is, upon customer request ordinarily furnished by the telecommunication service supplier). **Note:** A pigtail cable (Part No. 1853134) will be provided with each 3842 to allow a 3842 to be connected when a WE 404B or 549A receptacle is not available from the local telecommunication service supplier.

If the 3842 is equipped with Switched Network Backup (#7951), another cable is supplied with the feature. This cable is also terminated with a four prong plug and requires the aforementioned type of receptacle which is connected to the

Data Access Arrangement CDT (WE 1000A) or FCC certified equivalent.

Related Equipment: The 3842 communicates with an appropriately configured 3872 Modem attached to a 3631 or 3632 with EIA/CCITT Interface Data Link (#3703) and Terminal Communication Adapter (#3211), or to an 8100 System via the Data Link with EIA Interface Adapter (#3701) and Communications Adapter *without* Clock - SDLC (#1602).

Customer Responsibilities: The customer must be informed of his responsibilities as detailed in the M 2700 pages and in the 3842 Section of the IBM 3630 Installation Manual-Physical Planning, GA24-3675, and the IBM System 3630 Plant Communication System Loop Installation-Physical Planning Manual, or the 8100 System Installation Manual - Physical Planning Manual. The customer is responsible for:

1. Private Line (non-switched) Channel -- arranging for the telecommunication service supplier to provide a Type 3002 voicegrade data channel (or equivalent) as described under "Communications Channel Specification" in the IBM 3630 Plant Communication System Description and the 2700 pages.
2. Switched Telecommunication Network -- arranging for the telecommunication service supplier to install the appropriate communication service equipped with the required data access arrangement as described in "Attachment to Facilities."
3. Using the problem determination procedures and filling out the trouble report prior to calling for service.
4. Providing voice communications between the 3842 and the processor/controller location to coordinate tests or re-equalization. The voice facility must be located such that an operator can use it while operating the controls on the front of the 3842 Alternate Voice Feature. See "Special Features."
5. Purchase, installation, testing, and maintenance of the loop Cabling System. Purchase Loop Continuity and Relay Tester, or equivalent, to test the loop wiring.
6. When installed on a 3630 Plant Communication System, the 3842 must be installed near a 3643. When installed on an 8100 System, the 3842 must be installed near a 3276 Control Unit Display Station, a 3278 Display Station, or an 8775 Display Terminal. These devices are required for remote loop installation, problem recovery procedures, and maintenance.

Prerequisites: An appropriately configured 3872 Modem installed at the controller/processor end of the telecommunication service. **Note:** Because the 3842 operates on a basic 3002 channel, the 3872 may require an RPQ. See "Communication Facilities" section of 3872 writeup in "Machines" for further information.

One of the following special features must be installed on the 3842: Multipoint Tributary (#5101), or Point-to-Point (#6101) ... see "Special Features."

A wrap type Loop Station Connector for connecting the 3842 to the Loop.

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 HZ): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V. **Note:** 115 V is usable on 120V systems. **Field Installation:** Not recommended.

[2] Loop Station Connector Cable; A 2.1 meter (7 foot) cable will be furnished as standard. If a 4.2 meter (14 foot) cable is desired, specify #9410.

[3] Telecommunication Cable (modem to telecommunication facility): Specify one of the following for each telecommunication channel or network connection -- #9750 ... to connect a 3832 equipped with Multipoint Tributary (#5101), or Point-to-Point (#6101) feature. to private line (nonswitched) channel ... #9754 to connect a 3872 equipped with Switched Network Backup (#7951) to a switched telecommunication network.

A 3.0 meter (10 foot) cable will be supplied. If a longer cable is required, indicate 4.5, 6.0 or 7.5 meters (15, 20 or 25 feet) as the quantity of the cable specified (#9750, 9754). **Note:** MES orders to add the Switched Network Backup Feature (#7951) must include the telecommunication cord specify number (#9754) for the Switched Network Backup cord.

[4] 3630 Test Loop: Specify #9445 on the first 3842 to be used with a 3631 or 3632 and located in a different servicing branch office from the 3631 or 3632.



3842 Loop Control Unit (cont'd)

PRICES:	Mdl	MLC 5 Yr	Purchase*	MMMC
3842	1	\$215	\$5,725	\$42.50

Purchase Option: 55% Per Call: 1
 Maintenance: D Warranty: B Useful Life Category: 2
 Termination Charge Months: 6 Termination Charge Percent: 20%
 Upper Limit Percent: 5%

SPECIAL FEATURES

ALTERNATE VOICE (#1051). Provides signalling capability and a socket on the operator panel into which a customer provided handset may be plugged permitting voice communication with the distant 3872 Modem. Data cannot be simultaneously transmitted with voice. A handset is not provided. **Maximum:** One. **Limitation:** Cannot be used when the 3842 or the 3872 Modem at the controller/processor end is in switched back-up operation. **Field Installation:** Yes.

MULTIPOINT TRIBUTARY (#5101). Used on each 3842 attached as a tributary station in a centralized multipoint network. **Note:** The 3872 Modem at the controller/processor end and must always serve as the control station. This feature provides an operator adjustment on the front panel of the 3842 to compensate for line distortion. **Maximum:** One. **Limitation:** Cannot be installed with Point-to-Point (#6101). See "Prerequisites" above. **Field Installation:** Yes.

POINT-TO-POINT (#6101). Used on the 3842 and on a 3872 Modem at the controller/processor end of a point-to-point private line (non-switched) channel. This feature provides an operator adjustment on the 3842 front panel to compensate for line distortion. **Maximum:** One. **Limitation:** Cannot be installed with Multipoint Tributary (#5101). See "Prerequisites" above. **Field Installation:** Yes.

SWITCHED NETWORK BACK-UP MANUAL ANSWER (#7951). Provides the capability of attaching the 3842 to the public switched network as back-up to the private line (non-switched) channel. In back-up mode it can communicate point-to-point with a 3872 Modem at the controller/processor that is equipped with Switched Network Back-up (#7951). A fixed compromise equalizer is provided for the back-up operation. A front panel switch permits operator selection of either the prime or the back-up facility. Both facilities cannot be used simultaneously.

Attachment to the switched network is made via the common carrier Data Access Arrangement Type CDT (or FCC certified equivalent). Calls must be established and answered manually. **Note:** To use this feature, operator intervention at the 3872 Modem is required. Loop attached terminals will not be required to make any modification. Conditioning of the telecommunication service local loop for transmission of data greater than 300 bps is required. **Maximum:** One. **Limitations:** Customer must be cautioned not to use this feature as a prime mode of operation but in back-up mode only. **Specify:** Telecommunication Cord -- #9754. **Field Installation:** Yes.

Special Feature Prices:		MLC 5 Yr	Purchase	MMMC
Alternate Voice	#1051	\$ 15	\$455	\$ 2
Multipoint Tributary	5101	17	424	4
Point-to-Point	6101	9	212	2
Switched Network Back-up, Manual	7951	24	500	7

* Pilot Test Plan applies.

**3845 DATA ENCRYPTION DEVICE**

Purpose: A table top or shelf mounted encryption/decryption device for data transmitted over a communication line. The 3845 is positioned between a data terminal equipment (DTE) and a data communications equipment (DCE), one at each end of a half duplex or duplex communication line. The 3845 will operate with Start-Stop, Bisynchronous, or Synchronous Data Link Control (SDLC) protocol at speeds ranging from 110 bps to 19,200 bps. See "Limitations" under "Communications."

Attachable devices: The 3845 is transparent to the DCE and the DTE. Control signals used by the 3845 are redriven in compliance with the EIA-CCITT specification. All other signals are cable fed through the 3845. The 3845 will attach wherever EIA-RS-232C/CCITT-V.24 interface requirements are met.

Models 1-3 -- for use with Start-Stop or SDLC line protocol (S/S or SDLC).

- Model 1** A single half duplex unit operating on a 2 or 4 wire half duplex communication line.
- Model 2** A dual half duplex unit, with each half duplex device completely independent of the other, operating over 2 or 4 wire half duplex communication lines.
- Model 3** A full duplex unit operating over a full duplex communication line.

Models 11-13 -- for use with Bisynchronous, Bisynchronous with Business Machine Clocking (BMC), or Synchronous Data Link Control (BSC/SDLC or BSC with BMC/SDLC).

- Model 11** A single half duplex unit, operating on a 2 or 4 wire half duplex communication line in BSC/SDLC or BSC with BMC/SDLC ... see Specify Features.
- Model 12** A dual half duplex unit, with each half duplex device completely independent of the other, operating over 2 or 4 wire half duplex lines in BSC/SDLC or BSC with BMC/SDLC ... see Specify Features. *Limitation:* A model 12 must have both outputs either BSC/SDLC or both BSC with BMC/SDLC.
- Model 13** A full duplex unit operating over a full duplex communication line in BSC/SDLC or BSC with BMC/SDLC ... see Specify Features.

Highlights: A communication security device that provides encryption/decryption of digital data transmitted over a communication line. The 3845 implementation of the Data Encryption Standard (DES) conforms to the National Bureau of Standards DES algorithm published as FIPS #46, January 15, 1977.

Two or more data encryption devices (3845 or 3846) are needed, one at each termination of a communication line (point-to-point or multi-point). *Limitation:* A 3845 or 3846 is required at each node in order to have message header information in the clear through that node.

The 3845 is cabled to the DTE via the cable that is provided by the DTE manufacturer for attachment to the DCE. Attachment from the 3845 to the DCE is by a cable provided with the 3845. One cable is provided per line function. *Limitation:* The cable provided with the 3845 is 1.5 metres long (5 ft.). This adds load capacitance to the DTE/DCE. See the General Information Manual, GA27-2865, for specific information on the additional capacitance.

An accessory, the Personalization/Key Entry Unit (P/KEU), must be available at each site location having a 3845. This accessory is used to enter the key variable, the seed, and to personalize the 3845 to the customer's communication line. The key variable is a 56 bit plus parity code, entered by the customer at a frequency consistent with his security requirements. The customer defines his own keys, selects them in a random manner, and enters them manually. The seed is 1 to 16 hexadecimal random characters used to initiate the synchronization message. The personalization consists of 4 hexadecimal characters of information that personalizes the 3845 to the communication facilities, such as line discipline, line speed, method of clocking, and synchronization message length.

The 3845 has a by-pass switch that allows messages to be sent in the clear and is also used by the customer in fault isolation. A battery is provided that maintains power to the storage registers containing the key variable, seed, and personalization data when the 3845 AC power is removed.

Security is provided by use of interlocks that remove power, including battery power, from the storage registers whenever the service cover is removed. The seed, key variable and personalization must be re-entered when all (battery and AC) power is removed.

Communications: The 3845 models 1, 2 and 3 encrypt/decrypt data if (a) the DTE/DCE conforms to interface EIA-RS-232C or CCITT-V.24, (b) uses S/S or SDLC protocol, (c) operates on a half

duplex or duplex facility, (d) is within the speed of 110-9600 bps for asynchronous operation or the speed of up to 19,200 bps for synchronous operation, and (e) uses a 7 or 8 bit code (exclusive of the required start and stop bits) for asynchronous operation or uses an 8 bit SDLC flag for SDLC operation.

The 3845 models 11, 12 and 13 encrypt/decrypt data if (a) the DTE/DCE conforms to interface EIA-RS-232C or CCITT-V.24, (b) uses BSC or SDLC protocol, (c) operates on a half duplex or duplex facility, (d) is within the speed of up to 19,200 bps, and (e) uses an EBCDIC or ASCII code for BSC or uses an 8 bit SDLC flag for SDLC operation.

Limitations: (1) SDLC will not operate with Non-Return to Zero Inverted (NRZI) transmission mode. NRZI describes the way information bits are presented at the E.I.A. interface. NRZI is required in some SDLC networks when using IBM 3872 modems to ensure modem synchronization. (2) Operation at 19,200 bps may require the user to optimize cable length and quality. For additional information, refer to the General Information Manual, GA27-2865.

Data Communications Equipment: Data Communications Equipment operating in non-NRZI is needed with the 3845 when operating in SDLC protocol. IBM external modems may be attached to the 3845, i.e.:

Modem	Speed (bps)
3872	1200/2400 (BSC only)
3874	4800
3875	7200

Problem Determination Procedures: A by-pass switch is provided that allows transmission in the clear to permit determining whether a problem exists in the 3845 or in other equipment. See "Customer Responsibility" below.

Problem determination is a customer responsibility that does not involve the customer engineer.

Customer Set-Up (CSU): The 3845 is designated as a customer set-up device thereby offering the customer relocation flexibility. CSU is a customer responsibility that does not involve the customer engineer.

Customer Responsibility: The customer is responsible to:

- Provide an adequate site and other preparation.
- Receipt at the customer's receiving dock, unpacking and set up of the 3845.
- Connect cables to the DTE and DCE.
- Personalize to the communication facility.
- Enter the seed.
- Enter the key variable.
- Use and follow the problem determination procedures and to follow instructions for service of the 3845.

Note: Appropriate procedures are provided by IBM for personalization and entering the seed and key variable.

Maintenance:

Spares: The customer may wish to replace a failing 3845 with a spare and must be advised to purchase spares for such use. The number of spare devices recommended is dependent upon the number of devices the customer has installed, his application requirements, physical locations, and layouts.

IBM Repair Center Service: Maintenance of the 3845 will normally be at a designated IBM Repair Center. All maintenance, parts replacement, adjustments, and repair shall normally be performed at the designated IBM Repair Center. It shall be the customer's responsibility to set up the equipment and to determine when remedial maintenance is required. When remedial maintenance is required, it shall be the customer's responsibility to determine the failing device, pack the device in the designated shipping container and ship it prepaid to the designated IBM Repair Center.

IBM will pre-pay the transportation charges for return of the repaired device. There is no regularly scheduled preventive maintenance recommended by IBM on these devices.

The repair service is available under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement or on a Time and Material basis.

Customers with machines not under an IBM Maintenance Agreement have the option to ship the machines to the designated IBM Repair Center for repair under the IBM Repair Center Machine Repair Authorization Form GX27-2981, in which case repair will be made (if the machine is repairable). Alternately, upon request, the IBM Repair Center will provide, for a minimum charge, an estimate of repair charges. This charge covers handling, inspection, adjustments, testing, return shipping charges and estimating of repair charges.

3845 Data Encryption Device (cont'd)

The 3845 is eligible for maintenance agreement service immediately following expiration of the service and parts warranty at the monthly charge shown under MMMC in "PRICES" below.

If maintenance agreement service is not contracted for immediately following expiration of the service and parts warranty and the customer wants agreement service, the customer may ship the machine(s) to the designated IBM Repair Center for an inspection. If, on the basis of an inspection, the repair center concludes that a machine is not repairable, no further work will be performed and the machine will be returned to the customer with a minimum charge to cover handling, inspection, testing, and a return shipping charge.

In all other cases, the IBM Repair Center will charge a minimum fee per machine to cover handling, inspection, adjustments, testing, and return shipping. In addition all parts needed will be billed at IBM's prevailing parts prices and the additional time required for repairs will be billed at IBM's applicable service rates, if so authorized by the customer. The machine will then be eligible for maintenance agreement service.

PREREQUISITES: (1) A S/S, BSC or SDLC communication line ... (2) Compliance with EIA-RS-232C or CCITT-V.24 ... (3) External modems, IBM or non-IBM ... (4) Personalization/Key Entry Unit (Accessory) available at site location. See M10000 pages.

Bibliography: GA27-2865 General Information Manual
XXXX-XXXX Principles of Operation *

Specify: [1] Line Voltage Plug (115/120 V Power and Line Cord, 1-phase, 60 Hz): #9890 for locking plug ... #9891 for non-locking plug.

[2] Line Cord Length: If the standard 2.8 m (9 ft.) power cable is not desired, specify: #9511 for 1.8 m (6 ft.) line cord, #9512 for 3.7 m (12 ft.) line cord, #9513 for 4.5 m (15 ft.) line cord.

[3] For 3845 models 11, 12 and 13: Specify one ... installation available at time of manufacture only.
#9110 -- BSC/SDLC, or
#9115 -- BSC with BMC/SDLC

PRICES:	Mdl	Purchase	MMMC
3845	1	\$2,125	\$6.50
	2	3,465	8.50
	3	3,180	8.50
	11	2,195	6.50
	12	3,600	8.50
	13	3,315	8.50

Warranty: B Useful Life: 2

Model Changes: At time of manufacture only.

ACCESSORIES: The following items are available on a purchase only basis. Order the Part No. indicated below at the price listed in the M10000 pages. See M10000 pages for additional information.

Personalization/Key Entry Unit (Part No. 4407908) to enter key variable, seed, and personalization data. One must be available at each site.

A **Battery (Part No. 1743456)**, is needed to replace the installed battery. The replacement schedule is defined in the Principles of Operation manual. Discharged batteries should be returned to IBM.

3846 DATA ENCRYPTION DEVICE

Purpose: A rack mounted encryption/decryption device for data transmitted over a communication line. The 3846 is positioned between a data communications equipment (DCE) and a data terminal equipment (DTE), one at each end of a half duplex or duplex communication line. The 3846 will operate with a Start/Stop, Bisynchronous, or Synchronous Data Link Control (SDLC) protocol at speeds from 110 bps to 19,200 bps. See "Limitations" under "Communications."

Attachable Devices: The 3846 is transparent to the DCE and DTE. Control signals used by the 3846 are redriven in compliance with the EIA-RS-232C/CCITT-V.24 specification. All other signals are cable fed through the 3846. The 3846 will attach wherever EIA-RS-232C/CCITT-V.24 interface requirements are met.

Model 1 A power unit capable of providing power to 1 to 4 line function units.

Models 2 and 3 for use with Start-Stop or Synchronous Data Link Control (SDLC) line protocol meeting EIA-RS-232C or CCITT-V.24 interface. Requires a 3846 mdl 1 for power.

Model 2 A dual half duplex line function unit, with each half duplex device completely independent of the other, operating over 2 or 4 wire half duplex communication lines.

Model 3 A full duplex line function unit operating over a full duplex communication line.

Models 12 and 13 for use with Bisynchronous, Bisynchronous with Business Machine Clocking (BSC, BSC with BMC), or SDLC with EIA-RS-232C or CCITT-V.24. Requires a 3846 mdl 1 for power.

Model 12 A dual half duplex line function unit with each half duplex device completely independent of the other, operating over 2 or 4 wire half duplex communication lines in BSC, BMC, SDLC line protocol ... see Specify Features. *Limitation:* A model 12 must have both outputs either BSC/SDLC or both BSC with BMC/SDLC.

Model 13 A full duplex line function unit operating over a full duplex facility in BSC, BMC, SDLC line protocol ... see Specify Features.

Highlights: A communication security device that provides encryption/decryption of digital data, transmitted over a communication line. The 3846 implementation of Data Encryption Standard (DES) conforms to the National Bureau of Standards DES algorithm published as FIPS 46, January 15, 1977.

Two or more data encryption devices (3845 or 3846) are needed, one at each termination of a communication line (point-to-point or multipoint). *Limitation:* A 3845 or 3846 is required at each node in order to have message header information in the clear through that node.

The 3846 is cabled to the DTE via the cable that is provided by the DTE manufacturer for attachment to the DCE. Attachment from the 3846 to the DCE is by a cable provided with the 3846. One cable is provided per line function. *Limitation:* The cable provided with the 3846 is 1.5 metres (5 ft.) long. This adds load capacitance to the DTE/DCE. See the General Information Manual, GA27-2865 for specific information on the additional capacitance.

An accessory, the Personalization/Key Entry Unit (P/KEU), must be available at each site location having a 3846. This accessory is used to enter the key variable, the seed, and to personalize the 3846 to the customer's communication line. The key variable is a 56 bit plus parity code, entered by the customer at a frequency consistent with their security requirements. The customer defines the keys, selects them in a random manner, and enters them manually. The seed is 1 to 16 hexadecimal random characters, used to initiate the synchronization message. The personalization consists of 4 hexadecimal characters of information that personalizes the 3846 to the specific communication line characteristics such as line discipline, line speed, method of clocking, and synchronization message length.

The 3846 depends on the customer providing a method of switching to enable the user to send messages in the clear and for fault isolation. A battery is provided that maintains power to the storage registers containing the key variable, seed, and personalization data when the 3846 AC power is turned off.

Security is provided by the use of interlocks that remove power, including battery power, from the storage registers whenever a line function unit is removed from the rack. The seed, key variable and personalization must be re-entered when all power (battery and AC) is removed.

Communications: The 3846 models 2 and 3 encrypt/decrypt data

* SRL No. to be announced in future PRL.

3846 Data Encryption Device (cont'd)

if (a) the DTE/DCE conforms to interface EIA-RS-232C or CCITT-V.24, (b) uses a S/S or SDLC protocol ... (c) operates on a half duplex or duplex facility, (d) is within the speed of 110-19,200 bps, and (e) uses 7 or 8 bit transmission code exclusive of the required start and stop bits for asynchronous operation or uses an 8 bit SDLC flag for SDLC operation.

The 3846 models 12 and 13 encrypt/decrypt data if (a) the DTE/DCE conforms to interface EIA-RS-232C or CCITT-V.24, (b) uses a BSC or SDLC protocol, (c) operates on a half duplex or duplex facility, (d) is within the speed of up to 19,200 bps, and (e) uses an EBCDIC or ASCII code for BSC or uses an 8 bit SDLC flag for SDLC operation.

Limitations: (1) SDLC will not operate with Non-Return to Zero Inverted (NRZI) transmission mode. NRZI describes the way information bits are presented at the E.I.A. interface. NRZI is required in some SDLC networks when using IBM 3872 modems to ensure modem synchronization. (2) Operation at 19,200 bps may require the user to optimize cable length and quality. For additional information, refer to the General Information Manual GA27-2865.

Data Communications Equipment: Data Communications Equipment operating in non-NRZI is needed with the 3846 when operating in SDLC protocol. IBM external modems may be attached to the 3846.

Modem	Speed (bps)
3872	1200/2400 (BSC only)
3874	4800
3875	7200

Problem Determination Procedures: A customer installed switch panel must be used to permit determining whether a problem exists in the 3846 or in the other equipment. See "Customer Responsibility" below.

Problem determination is a customer responsibility that does not involve the customer engineer.

Customer Set-Up (CSU): The 3846 is designated as a customer set-up device, thereby offering the customer relocation flexibility.

CSU is a customer responsibility that does not involve the customer engineer.

Customer Responsibility: The customer is responsible to:

- Provide an adequate site and other preparation.
- Receipt at the customer's receiving dock, unpacking and set up of the 3846.
- Make the interconnection between the 3846 mdl 1 and the 3846 line function devices
- Personalize to the communication facility.
- Enter the seed.
- Enter the key variable.
- Use and follow the problem determination procedures and to follow instructions for service of the 3846.

Note: Appropriate procedures are provided by IBM for personalization and entering the seed and key variable.

Maintenance:

Spare: The customer may wish to replace a failing 3846 with a spare and must be advised to purchase sufficient spare devices for such use. The number of spare devices recommended is dependent upon the number of devices the customer has installed, his application requirements, physical locations, and layouts.

IBM Repair Center Service: Maintenance of the 3846 will normally be at a designated IBM Repair Center. All maintenance, parts replacement, adjustments, and repair shall normally be performed at the designated IBM Repair Center. It shall be the customer's responsibility to set up the equipment and to determine when remedial maintenance is required. When remedial maintenance is required, it shall be the customer's responsibility to determine the failing device, pack the device in the designated shipping container and ship it prepaid to the designated IBM Repair Center. IBM will pre-pay the transportation charges for return of the repaired device. There is no regularly scheduled preventative maintenance recommended by IBM for these units.

The repair service is available under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement or on a Time and Material basis.

Customers with machines not under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement, have the option to ship the machines to the designated IBM Repair Center for repair under the IBM Repair Authorization Form GX27-2981, in which case repair will be made (if the machine is repairable). Alternatively, upon request, the IBM Repair Center will provide, for a minimum charge, an estimate of repair charges.

This charge covers handling, inspection, adjustment, testing, estimating of repair charges and return shipping charges.

The 3846 is eligible for maintenance agreement service immediately following expiration of the service and parts warranty at the monthly charge shown under MMMC in "PRICES" below.

If maintenance agreement service is not contracted for immediately following expiration of service and parts warranty and the customer now wants maintenance agreement service, the customer may ship the machine(s) to the designated IBM Repair Center for an inspection. If on the basis of an inspection, the repair center concludes that a machine is not repairable, no further work will be performed and the machine will be returned to the customer with a minimum charge to cover handling, inspection, testing and return shipping charges.

In all other cases, the IBM Repair Center will charge a minimum fee per machine to cover handling, inspection, adjustments, testing and a return shipping charge. In addition all parts needed will be billed at IBM's prevailing parts prices and the additional time required for repairs will be billed at IBM's applicable service rates if so authorized by the customer. The machine will then be eligible for maintenance coverage.

PREREQUISITES: (1) A S/S, BSC or SDLC communication line ... (2) Compliance with EIA-RS-232C or CCITT-V.24 ... (3) External modems, IBM or non-IBM ... (4) Accessory Personalization/Key Entry Unit available at site location ... (5) Accessory mounting panel ... (6) Accessory blank panel may be ordered if desired. See M10000 pages.

Bibliography: GA27-2865 General Information Manual
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Specify: [1] Line Voltage Plug (115/120 V Power and Line Cord, 1-phase, 60 Hz): #9890 for locking plug, #9891 for non-lock plug.

[2] Line Cord Length -- if the standard 2.8M (9 ft.) power cable is not desired, specify: #9511 for 1.8M (6 ft.) line cord, #9512 for 3.7M (12 ft.) line cord, #9513 for 4.5M (15 ft.) line cord.

[3] For models 12 and 13: Specify one ... installation available at time of manufacture only.

- #9110 - BSC/SDLC, or
- #9115 - BSC with BMC/SDLC

PRICES:	Mdl	Purchase	MMMC
3846	1	\$ 910	\$1.00
	2	2,680	4.50
	3	2,445	4.50
	12	2,815	4.50
	13	2,580	4.50

Warranty: B Useful Life: 2

Model Changes: Available at time of manufacture only.

ACCESSORIES: The following items are available on a purchase only basis. Order the Part No. indicated below at the price listed in the M10000 pages. See M10000 pages for additional information.

Personalization/Key Entry Unit, Part No. 4407908, to enter key variable, seed, and personalization data. One must be available at each site.

Mounting Plate, Part No. 6813128, to attach 4 type 3846 units to a rack. One required for each 4 units.

Blank Panel, Part No. 4409058, to close any unused opening in a mounting panel. One may be ordered for each unused opening.

A Battery, Part No. 1743456, is needed to replace the installed battery. The replacement schedule is defined in the Principles of Operation Manual. Discharged batteries should be returned to IBM.

* SRL No. to be announced in future PRL.



IBM 3851 MASS STORAGE FACILITY

Purpose: Large capacity storage and control facility for the 3850 Mass Storage System (MSS) for attaching to S/370 mdls 145, 145-3, 148, 155 II, 158, 165 II and 168, or a 3031, 3032, 3033, or 4341 Processor.

Highlights: Included are the storage facility for data cartridges, Data Recording Devices (DRD) and their associated Data Recording Controls (DRC) for the transfer of data between the data cartridges and the 3350/3333/3330 Disk Storage devices, a Cartridge Access Station for the manual entry and removal of data cartridges, two accessors and their associated controls for the movement of data cartridges within the 3851, and a Mass Storage Control (MSC) for control of the 3850 MSS.

Models: A-Series One Mass Storage Control
B-Series Two Mass Storage Controls ... one MSC is the active control ... the second is an alternate control.

	Capacity		Data Recording Devices	Data Recording Control
	Number of Cartridges	Max bytes (Billions)		
Model A1/B1	706	35.3	2	1
Model A2/B2	2044	102.2	4	2
Model A3/B3	3382	169.1	6	3
Model A4/B4	4720	236.0	8	4

Limitations: In a 3850 MSS configuration with one 3851 MSF (B-series) or two 3851 MSFs (A-series), both MSCs must be featured identically if complete backup is required. *NOTE:* On a 2880 Block Multiplexer Channel, Extended Unit Control Words (#3851, 3852) may be required to expand DASD device address capability ... The 155 II SYSGEN configuration is restricted by the maximum number of non-shared block multiplexer subchannels (in groups of eight). See the Channel Section of the "Guide to IBM System/370 Model 155", GC20-1729 for description of assignment and number available. The total device addresses (real, virtual, non-existent, or non-Mass Storage System) SYSGENed may not exhaust the pool of non-shared UCWs.

PREREQUISITES:

A control unit position on a S/370 or 4341 Processor byte or block multiplexer channel for each MSC -- one for each A-Series MSF, two for a B-Series MSF.

A minimum of one 3830 Storage Control mdl 3 on S/370 mdls 145, 145-3, 148, 155 II, 158, 165 II and 168, or a 3031, 3032, 3033 or 4341 Processor, or one Integrated Storage Controls (#4650) with the Staging Adapter (#7220) on S/370 mdls 158 and 168.

A minimum of either two 3333 Disk Storage and Controls or two 3350 mdl A2/A2Fs. See Note on M 3333 pages for feature changes required when 3333's are retained for use with a 3851.

Data Cartridges (IBM Part No. 2496971, Purchase Only) must be ordered separately

Maximums:

Attaches to a maximum of four S/370s (any combination of UPs, MPs, APs) or 3031, 3032, 3033 Processor Complexes.

A maximum of two 3851 MSFs from the A-series of models or one 3851 MSF from the B-series of models can be included in the 3850 Mass Storage System (MSS).

In a 3850 Mass Storage System (MSS) there is one active Mass Storage Control. It can address a total of eight 3850 MSS components: 3851 MSF control function, 3830 Storage Control mdl 3s, and Integrated Storage Controls (#4650) with the Staging Adapter (#7220) on S/370 mdls 158 and 168. (Each ISC counts as two components). The number of 3850 MSS components addressed can be increased to sixteen with installation of the MSC Twin Port Feature (#4901, 4902). A second Mass Storage Control (either a B-series or the second A-series) may be designated as an alternate control.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: The accent panels above and below the cartridge access station are white. The two end covers on the 3851 MSF are gray. The remainder of the 3851 is available in #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white. **FIELD INSTALLATION:** Yes.

[3] In a 3850 MSS configuration with two A-series MSFs, specify #9120 for the designated primary 3851 MSF and #9121 for the secondary 3851 MSF.

PRICES:	Mdl	MAC/MRC	ETP/MLC 2 yr	Purchase	MMMM
3851	A1	\$12,937	\$11,010	\$ 496,050	\$1,540
	A2	19,047	16,210	730,050	2,145
	A3	25,157	21,410	964,050	2,750
	A4	31,267	26,610	1,198,050	3,355
	B1	16,979	14,450	651,000	1,705
	B2	23,089	19,650	885,000	2,310
	B3	29,199	24,850	1,119,000	2,915
	B4	35,309	30,050	1,353,000	3,520

Plan Offering: Plan B Purchase Option: 55% Maintenance: D
Warranty: B Useful Life Category: 2 Per Call: 3
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	A2	A3	A4	B1	B2	B3	B4
A1	\$234,000	\$468,000	\$702,000	\$154,950	\$388,850	\$622,950	\$856,950
A2	---	234,000	468,000	---	154,950	388,950	622,950
A3	---	---	234,000	---	---	154,950	388,950
A4	---	---	---	---	---	---	154,950
B1	---	---	---	---	234,000	468,000	702,000
B2	---	---	---	---	---	234,000	468,000
B3	---	---	---	---	---	---	234,000

SPECIAL FEATURES

Note: In a 3850 MSS configuration with one 3851 MSF (B-series) or two 3851 MSFs (A-series) both MSCs must be configured identically if complete backup is required.

MASS STORAGE CONTROL TWIN PORT (#4901, 4902). [#4901 for A and B mdls ... #4902 for B mdls only] #4901 applies to the A-series MSC and the first MSC in a B-series. #4902 applies to the second MSC in a B-series, and requires #4901 as a prerequisite. Permits the MSC to address 8 additional, for a total of 16, 3850 MSS components: 3851 MSF control functions*, 3830 Storage Control mdl 3s on S/370 mdls 145, 145-3, 148, 155 II, 158, 165 II and 168, and 3031, 3032, 3033 or 4341 Processor, and the ISC (#4650) with the Staging Adapter (#7220) on S/370 mdls 158 and 168. Each ISC has two paths and counts as two components.

* In a 3850 MSS configuration with two A-series models there are two 3851 MSF control function components.

REMOTE SWITCH ATTACHMENT (#6148). [For A and B mdls] To control the two-channel interfaces on the basic 3851 MSF from a remote configuration control panel. Also controls the Two Channel Switch, Add'l (#8171) if installed. For B models, this feature is associated with the primary MSC and must be installed in addition to #6150 below, which is associated with the alternate MSC. **Field Installation:** Yes.

REMOTE SWITCH ATTACHMENT (#6150). [For B mdls only] To control the two-channel interfaces on the basic 3851 (alternate MSC) from a remote configuration control panel. Also controls the Two Channel Switch, Add'l (#8172) if installed. **Field Installation:** Yes. **Prerequisite:** Remote Switch Attachment (#6148).

TWO CHANNEL SWITCH, ADD'L (#8171). [For A and B mdls] Permits attachment to two additional S/370 or 4341 Processor channels, providing a total of four S/370 or 4341 channel attachments. The channels can be on the same or different CPUs, to a maximum of four CPUs with no more than two channels to a single CPU. For B mdls, the feature is associated with the active MSC and must be installed in addition to #8172 below, which is associated with the alternate MSC. **Field Installation:** Yes.

TWO CHANNEL SWITCH, ADD'L (#8172). [For B mdls only] Permits attachment to two additional S/370 or 4341 Processor channels, providing a total of four S/370 or 4341 channel attachments. The channels may be on the same or different CPUs, to a maximum of four CPUs with no more than two channels to a single CPU. **Field Installation:** Yes. **Prerequisite:** Two Channel Switch, Add'l (#8171).

Special Feature Prices:	MAC/MRC	ETP/MLC 2 yr	Purchase	MMMM
Mass Stor Cntrl Twin Port #4901	\$159	\$135	\$ 6,235	\$2.00
Mass Stor Cntrl Twin Port 4902	159	135	6,235	2.00
Remote Sw Attach 6148	NC	NC	NC	NC
Remote Sw Attach 6150	NC	NC	NC	NC
Two Chan Sw, Add'l 8171	402	342	15,590	6.00*
Two Chan Sw, Add'l 8172	402	342	15,590	6.00*

**IBM 3863 MODEM**

Purpose: A 2400 bps modem used to provide communication products with a means for transmitting data over telecommunication channels (normally telephone lines).

This advanced microprocessor-based modem significantly enhances communication network management and network problem determination.

The modem diagnostic functions operate with Network Problem Determination Application (NPDA) Release 2 providing:

- Probable cause of network errors
- Alert messages on error threshold
- Formatted modem test results

Models

Model 1 Operates in half-duplex or duplex mode over 4-wire non-switched duplex facilities. Operates in point-to-point, multipoint control, or multipoint tributary mode.

Model 2 Operates in half-duplex mode over 2-wire switched telecommunication networks. Operating mode is point-to-point.

Model Changes: Available at time of manufacture only.

Highlights - Standard Features

- A microprocessor for signal processing.
- Auto-answer - automatic answering of switched network calls ... model 2, or model 1 with SNBU special feature.
- Automatic Remote Speed Selection - the transmission speed of the remote modem follows the transmission speed (2400/1200 bps) of the local modem.
- Anti-Streaming - a multipoint tributary modem can automatically cut off transmission if a terminal holds "Request to Send" up longer than 40 seconds (an abnormal condition in IBM communication protocol). Customer switch option.
- Automatic and Adaptive Equalization - equalization is automatically performed by the modem and continues to adapt in data mode.
- Line conditioning is not required.
- The protective circuits required for FCC registration in the U.S. are built into the 3863 modems to allow direct attachment to Public Switched Network (conditional upon FCC registration).
- Operator panel with operational status indicators and data quality (Good, Poor) indications.
- The modem diagnostic functions referred to as Link Problem Determination Aid (LPDA), operate with System Network Architecture (SNA) and associated program products. Under control of these programs the modem accepts commands and initiates tests that help isolate problems to the line, local or remote modem, or elsewhere in the network and provide the network operator with the most probable cause of network problems. These program products are:
 1. Network Communication Control Facility (NCCF) Release 1 - (PP 5735-XX6)
 2. Network Problem Determination Application (NPDA) Release 2 - (PP 5735-XX8)
 3. ACF/NCP Release 2.1 - (PP 5735-XX1)
- Provides its own clocking or will accept DTE (external) clocking.

Highlights - Optional Features ... see "Special Features" and "Accessories."

- 4-wire Switched Network Backup (SNBU), special feature available on model 1, provides backup for point-to-point or multipoint non-switched telecommunication facilities.
- Fan Out - this special feature available on model 1 allows attachment of up to three teleprocessing machines to one 3863 model 1.
- Rack Mount Adapters (Accessories) are available.
- Tail Circuit Attachment - this accessory allows a 3863 model 1 to attach to a 3865 Modem equipped with Data Multiplexer (#3260).
- Extended Diagnostic Card - this special feature available on model 1 indicates remote modem power loss. When used with NPDA, it expands the problem determination capability. See IBM Program Product 5735-XX8.

Data Rate: 2400 bps with back-up of 1200 bps (half speed).

Link Problem Determination Aid Diagnostic Tests: All modems

will respond to diagnostic commands from the system that help provide the status of any modem in the link, its attached terminal, and the quality of the received signal over the communication facility. Test requests and responses utilize the same data path and controls that are used by the S/370 or 4300 processor for data transmission. Thus diagnostic status/test requests can be interspersed with data requests without interrupting terminal sessions.

The Network Problem Determination Application (NPDA) program product provides functions for the collection, storage, and retrieval of network error/management data. NPDA implemented under the Network Communication Control Facility (NCCF) program product has both summary and detailed level information for determining probable cause of network errors. Probable cause differentiates between errors in the communications controller, line, modem, modem interface, or terminals. NPDA will also utilize the new modem facilities to provide alert messages on error threshold and display formatted modem test results.

In addition, tests can also be executed from the modem operator panel. These manual tests include:

Modem Self-Test - this includes an extensive test of modem microcode, plus a data wrap with reduced thresholds for received data.

Modem/Line Transmit and Receive Tests - allows testing of modem and line for switched network.

Local Loop-back Test - provides a "wrap" or loop-back at the line interface to allow terminal wrap tests through the modem.

Remote Loop-Back Test - provides a "wrap" or loop-back at the remote modem to allow a DTE wrap test back through the local modem for non-switched modems. This test does not require remote operator assistance.

Loop Test - allows an end-to-end test to any modem on the link without remote operator assistance. This test is only available when operating over 4-wire telecommunication facilities.

Lamp Test - tests all indicator lights on the operator panel.

Customer Setup: The 3863 is designated for Customer Setup (CSU). This provides the customer with early availability and allows relocation of the unit without requiring IBM service personnel assistance. All switches will be set at the plant from customer order information. Switched network transmit level switches will not be accessible to customers.

Customer accessible "Setup Switches" are provided on the rear panel to allow reconfiguration of the modem where application needs change. For example, 3863 model 1s may be set for point to point, multipoint control, or multipoint tributary operation via the setup switches. NOTE: Some of these changes may require SYS-GEN changes in the program support.

Communications Facilities

Common Carrier Provided Facilities: Voiceband private line (non-switched) channel, type 3002 (or equivalent) as described in the Bell System Technical Reference PUB 41004, dated October 1973.

Privately Owned Communication Facilities: Equivalent to above.

International Facilities: Request your TP coordinator to contact TP coordinators of the other countries involved to determine the availability of such facilities. Transmission of data between the United States and Canada on non-switched or switched facilities is supported. (For non-switched operation, the channel in Canada must be schedule 4, type 4.)

Attachment to Facilities

Attachment to a private line (non-switched) channel is by a cable, supplied with the 3863, which is terminated with a four prong plug (WE 283B or equivalent). The plug mates with a receptacle (WE 404B or 549A surface mount or 493A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communications equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.)

If the 3863 mdl 1 is equipped with 4-wire Switched Network Backup (#7953), two of the following switched cables are also provided with the 3863. Attachment to a switched line channel is by a cable supplied with the 3863, which is terminated with an 8 pin mini plug (USOC 45S or 41S) for insertion into the programmed data jack provided by the telecommunication service supplier.

In the case of either Switched Network or Switched Network Back-up, the modem includes a protective coupler (conditional upon FCC Registration) which permits direct attachment to the U. S. Public Switched Network.

Related Equipment: The 3863 operates with IBM communication

3863 Modem (cont'd)

products capable of 2400 bps operation. See related equipment under "Specify." The 3863 must communicate with another appropriately configured 3863. The interconnecting cable between the machine and the modem must be supplied by the using machine.

Customer Responsibilities: The customer must be informed of his/her responsibilities as detailed in the M 2700 sales manual pages, and in the site preparation section of the Introduction and Site Preparation Guide (GA27-3200).

The customer is also responsible for:

- 1) Arrangements for price quotations, installation, and all costs of common carrier equipment and services.
- 2) Private Line (non-switched) Channel - arranging for the telecommunication service supplier to provide a voice grade data channel. Also arranging for the installation of the appropriate receptacle described in "Attachment to Facilities" above.
- 3) Switched Telephone Network - arranging for the telecommunication service supplier to install the appropriate communication service equipped with the required connecting device as described in "Attachment to Facilities" above and for attaching the IBM provided cable to the connecting device.
- 4) If the 3863 is to be attached to a non-IBM product, the interconnecting cable between the business machine and the modem must be supplied by the business machine.
- 5) Unpacking, and packing of the 3863, physical setup, and connection of cables at set-up time.
- 6) Notifying IBM of intent to relocate the unit, and following IBM instructions for relocation.
- 7) Disconnecting, packing, and movement to the customer's shipping dock at the time of discontinuance. Appropriate instructions will be furnished by IBM.
- 8) All three of the following Program Products must be installed for LPDA to function.
 1. NCCF Release 1 (PP 5735-XX6)
 2. NPDA Release 2 (PP 5735-XX8)
 3. ACF/NCP Release 2.1 (PP 5735-XX1)

Bibliography: See KWIC Index G320-1621 or specific systems bibliography.

Publications:

- IBM 3863, 3864 and 3865 Introduction and Site Preparation Guide, GA27-3200.
- IBM 3863 User's Guide - available with shipment.

SPECIFY:

- Voltage: (120 V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug. If standard 10 ft. (3.0 meter) power cable is not required, specify #9986 for 6 ft (1.8 meter) cable.
- Telecommunication Cord (modem to telecommunication line)
 - 10 feet (3 meters), specify #9710
 - 25 feet (7.5 meters), specify #9713
- Related Equipment: one 3863 Attachment Feature Code from the table below must be specified for each 3863, depending upon the unit to be attached.

Machine	Feature #	Machine	Feature #
2701	9505	3767	9537
3115	9527	3771	9540
3125	9525	3774	9542
3135	9512	3775	9543
3138	9550	3776	9544
3271	9513	3777	9528
3274	9558	3780	9521
3275	9514	3791	9535
3276	9557	4331	9571
3601	9532	6240	9562
3602	9532	6640	9556
3614	9532	6/420	9575
3624	9578	6/430	9552
3631	9560	6/440	9553
3632	9561	6/442	9576
3684	9572	6/450	9554
3704	9516	6/452	9577
3705	9515	6670	9563
3735	9517	8101	9569
3741	9526	8130	9567
3747	9526	8140	9568
Non-IBM	9520	MCII	9555
RPQ Machine	9524		

- Operational Mode - required for 3863 model 1s so that the modem can be shipped from the plant ready to install. Selection of one of these codes determines the network operational

mode of the modem. It also determines how the automatic data rate control feature in the modem will function. The two designations for automatic data rate control are:

Local Speed Control - signifies that modem data rate can only be changed by the "Full Speed/Half Speed" switch on the operator panel, or at the rate selected by its attached DTE through its control of the "Data Rate Select" interface lead to the modem.

Remote Speed Control - signifies that the modem will ignore its operator panel or interface data rate control setting and will automatically adjust its data rate to the rate it is receiving data over the telecommunication line.

The two operational modes available are point to point and multipoint.

Point to point - this configuration has two modems connected at each end of a telecommunication link. One must be specified as LOCAL, the other as REMOTE.

Multipoint - this configuration has several modems connected together. One modem is called the "Control Station" and broadcasts data to all other modems called "Tributary Stations" through "Polling" techniques. The system must control transmission requests to tributary modems to ensure that only one tributary transmits at a time.

Operational Mode Select Option Codes for 3863 Modem mdl 1s (must select one):

- Multipoint Control - specify #9320. Selects modem for operation as control station in a multipoint network. Modem is also set to "Local Speed Control."
- Multipoint Tributary - specify #9321. Selects modem for operation as tributary station in a multipoint network. Modem is also set to "Remote Speed Control."
- Point to Point, Local - specify #9322. Selects modem for point to point operation and "Local Speed Control." This specify should be used for point to point modems located at the "System Host Location" end of the telecommunication line.
- Point to Point, Remote - specify #9323. Selects modem for point to point operation and "Remote Speed Control."

Note: The operational mode can be changed by switch control.

PRICES	Mdl	MLC			
		MRC	2 Year	Purchase	MMMC
3863	1	\$71	\$60	\$2,135	\$11.50
	2	76	65	2,335	14.00

Plan Offering: Plan D
Warranty: B
Purchase Option: 55%
Termination Charge Percent: 25%
Upper Limit Percent: 5%
Initial Period of Maintenance Service Availability: 3 mos.

Machine Group: D
Per Call: 1
Useful Life Category: 2
Termination Charge Months: 5

SPECIAL FEATURES

FAN-OUT (#3901). [Mdl 1 only] Allows attachment of up to three teleprocessing machines to one 3863 model 1. See "Related Equipment" under "Specify" for applicable machines. Only one of the attached machines may transmit at a time. This feature may be used at a tributary station in a centralized multipoint network. In this configuration, multipoint programming discipline will provide the selection/control of the specified IBM terminals without any additional user involvement.

This feature may also be used to allow up to three of the specified IBM Multiplexers, or Communications Controllers, at a central site to share the same 3863 model 1 for backup purposes. In this case, although all of the machines attached to the 3863 will receive the incoming data simultaneously, the user switchover procedure must ensure that only one machine is sending. **Limitation:** Cannot be installed with DTE (external) clocking. **Field Installation:** Yes.

EXTENDED DIAGNOSTIC CARD (#7930). [Mdl 1 only] Used to give a remote modem power loss indication, which is reported to NPDA in a S/370 or 4300 processor. The feature must be installed in the local and remote modems. The feature card in the remote modem detects the loss of DC power and signals via an "out-of-band" tone to the local feature card. **Prerequisites:** #7930 must be installed in both the local and remote modems ... also see LPDA in "Highlights" for required Program Product support. **Field Installation:** Yes.

4-WIRE SWITCHED NETWORK BACKUP (4W-SNBU) (#7953). [Mdl 1 only] Available for all 3863 mdl 1 (non-switched line) modems. Provides backup for the non-switched telecommunication facility. Data rate in 4W-SNBU mode is the same as in normal non-switched line mode. 4W-SNBU allows restoration of the 4-wire service between two point to point or multipoint 3863s. For point



3863 Modem (cont'd)

to point configurations, except for the requirement to establish the switched connections, 4W-SNBU allows continuation of service with no operational or programming impact.

For multipoint configurations, operational (and possibly programming) modifications are required. 4W-SNBU can be configured in two ways:

- The 4W-SNBU feature is installed on the normal multipoint control station modem and on any tributary modems that require backup. To establish a backup path to any tributary, the control station modem must go to SNBU mode. In doing so, communication is broken to all other tributaries.
- A spare control station modem equipped with the 4W-SNBU feature is installed on a spare port at the control station location. The spare control station can then establish a 4W-SNBU connection to any 3863 tributary modem equipped with the 4W-SNBU feature. This tributary is deactivated from its normal polling list and assigned to the spare port. The normal control station continues to provide service to other tributaries still reachable over the non-switched line.

This feature requires two 2-wire "switched" telephone lines, and two telephones at the host site. Attachment to the switched lines is made as described in the "Attachment to Facilities" section above. This feature is designed to automatically answer when a call is received. Calls must be placed manually. When one call is placed and the connection is completed a four minute timer is started. The second line must be established within the time-out, otherwise the first line is automatically dropped. **Field Installation:** Yes.

Special Feature Prices:		MRC	MLC/ 2 Yr	Purchase	MMMC
Fan Out	#3901	\$24	\$20	\$ 750	\$2.00
Ext Diagnostic Card	7930	9	8	275	1.50
4-Wire SNBU	7953	38	32	1,110	9.00

ACCESSORIES

The following items are available on a purchase only basis. Order the Feature # indicated below.

RACK MOUNT ADAPTER (#6240). A rack adapter that fastens inside a standard 19 inch EIA rack. The adapter is a shelf with an inside width of 17-3/8 inches (441.3 mm) which will allow two standalone modems to be placed side by side. The adapter will fit racks with depths of 23-5/8 to 30 inches (600 to 760 mm). **Field Installation:** Yes.

TAIL CIRCUIT ATTACHMENT (TCA)(#7875). [Mdl 1 only] Allows the 3863 model 1 to attach to a 3865 Modem model 1 (9600 bps) equipped with Data Multiplexer (#3260). Permits an extension of a network via a separate set of modems and a separate communications channel. **Limitations:** No LPDA support available on tailed attachments ... 3863 model 1s in point to point or multipoint control mode only. **Field Installation:** Yes.

Rack Mount Adapter	#6240	\$70
Tail Circuit Attachment	7875	45

IBM 3864 MODEM

Purpose: A 4800 bps modem used to provide communication products with a means for transmitting data over telecommunication channels (normally telephone lines).

An advanced microprocessor-based modem which significantly enhances communication network management and network problem determination.

The modem diagnostic functions operate with Network Problem Determination Application (NPDA) Release 2, providing:

- Probable cause of network errors.
- Alert messages on error threshold.
- Formatted modem test results.

Models

Model 1 Operates in half-duplex or duplex mode over 4-wire non-switched duplex facilities. Operates in point-to-point, multipoint control, or multipoint tributary mode.

Model 2 Operates in half-duplex mode over 2-wire switched telecommunication networks. Operating mode is point-to-point.

Model Changes: Available at time of manufacture only.

Highlights - Standard Features

- A microprocessor for signal processing.
- Auto Answer - automatic answering of switched network calls - model 2, or a model 1 equipped with SNBU special feature.
- Automatic Remote Speed Select - the transmission speed of the remote modem follows the transmission speed (4800/2400 bps) of the local modem.
- Anti-Streaming - a multipoint tributary modem can automatically cut off transmission if a terminal holds "Request to Send" up longer than 40 seconds (an abnormal condition in IBM communication protocol). Customer switch option.
- Automatic and/Adaptive Equalization - equalization is automatically performed by the modem and continues to adapt in data mode.
- Operator panel with operational status indicators and data quality (Good/Poor) indications.
- The modem diagnostic functions referred to as Link Problem Determination Aid (LPDA), operate with System Network Architecture (SNA) and associated program products. Under control of these programs the modem accepts commands and initiates tests that help isolate problems to the line, local or remote modem, or elsewhere in the network and provide the network operator with the most probable cause of network problems. These program products are:
 1. Network Communication Control Facility (NCCF) Release 2 - (PP 5735-XX6)
 2. Network Problem Determination Application (NPDA) Release 2 - (PP 5735-XX8)
 3. ACF/NCP Release 2.1 - (PP 5735-XX1)
- Provides its own clocking or will accept DTE (external) clocking.
- Line conditioning is not required.
- The protective circuits required for FCC registration in U. S. are built into the 3864 modems to allow direct attachment to Public Switched Network (conditional upon FCC Registration).

Highlights - Optional ... see "Special Features" and "Accessories."

- 4-wire Switched Network Backup (SNBU), special feature on model 1, provides backup for point to point, or multipoint non-switched telecommunication facilities.
- Fan Out - this special feature on model 1 allows attachment of up to three IBM teleprocessing machines to one 3864 model 1.
- Rack Mount Adapters (Accessories) are available.
- Tail Circuit Attachment - this accessory allows a 3864 model 1 to attach to a 3865 Modem equipped with Data Multiplexer (#3260).
- Extended Diagnostic Card - this special feature, available on 3864 model 1, indicates remote modem power loss. When used with NPDA expands the problem determination capability. See IBM Program Product 5735-XX8.

Data Rate: 4800 bps with back-up of 2400 bps (half speed).

Link Problem Determination Aid Diagnostic Tests: All modems

will respond to diagnostic commands from the system which help provide status of any modem in the link, its attached terminal, and the quality of the received signal over the communication facility. Test requests and responses use the same data path and controls that are used by the S/370 or 4300 Processor for data transmission. Thus diagnostic status/test requests can be interspersed with data requests without interrupting terminal sessions.

The Network Problem Determination Application (NPDA) program product provides functions for the collection, storage and retrieval of network error/management data. NPDA implemented under the Network Communication Control Facility (NCCF) program product has both summary and detailed level information for determining probable cause of network errors. Probable cause differentiates between errors in the communications controller, line, modem, modem interface or terminals.

NPDA will also utilize the new modem facilities to provide alert messages on error threshold and display formatted modem test results. In addition, tests can also be executed from the modem operator panel. These manual tests include:

Modem Self Test - Includes an extensive test of modem micro-code, plus a data wrap with reduced thresholds for received data.

Modem/Line Transmit and Receive Tests - Allow testing of modem and line for a switched network.

Local Loop-back Test - Provides a "wrap" or loop-back at the line interface to allow terminal wrap tests through the modem.

Remote Loop-back Test - Provides a "wrap" or loop-back at the remote modem to allow a DTE wrap test back through the local modem for non-switched modems. This test does not require remote operator assistance.

Loop Test - Allows an end-to-end test to any modem on the link without remote operator assistance. This test is only available when operating over 4-wire telecommunication facilities.

Lamp Test - Tests all the indicator lights on the operator panel.

Customer Setup: The 3864 is designated for Customer Setup (CSU). This provides the customer with early availability and allows relocation of the unit without requiring IBM service personnel assistance. All switches will be set at the plant from customer order information. Switched network transmit level switches will not be accessible to customers.

Customer accessible "Setup Switches" are provided on the rear panel to allow reconfiguration of the modem where application needs change. For example, 3864 model 1s may be set for point to point, multipoint control, or multipoint tributary operation via the setup switches. NOTE: Some of these changes may require SYSGEN changes in the program support.

Communication Facilities

Common Carrier Provided Facilities: Voiceband private line (non-switched) channel, type 3002 (or equivalent) as described in the Bell System Technical Reference PUB 41004, dated October 1973.

Privately Owned Communication Facilities: Equivalent to above.

International Facilities: Request your TP coordinator to contact TP coordinators of the other countries involved to determine the availability of such facilities. Transmission of data between the United States and Canada on non-switched or switched facilities is supported. (For non-switched operation, the channel in Canada must be schedule 4, type 4.)

Attachment to Facilities

Attachment to a private line (non-switched) channel is by a cable, supplied with the 3864, which is terminated with a four prong plug (WE 283B or equivalent). The plug mates with a receptacle (WE 404B or 549A surface mount or 493A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communications equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.)

If the 3864 model 1 is equipped with 4-Wire Switched Network Backup (#7953), two additional switched cables are also provided with that modem. Attachment to a switched line channel is by a cable supplied with the 3864, which is terminated with an 8 pin mini plug (USOC 45S or 41S) for insertion into the programmed data jack provided by the telecommunication service supplier.

In the case of either Switched Network or Switched Network Backup, the modem includes a protective coupler (conditional upon FCC Registration) which permits direct attachment to the US Public Switched Network.



3864 Modem (cont'd)

For multipoint configurations, operational (and possibly programming) modifications are required. 4W-SNBU can be configured in two ways:

- The 4W-SNBU feature is installed on the normal multipoint control station modem and on any tributary modems that require backup. To establish a backup path to any tributary, the control station modem must go to SNBU mode. In doing so, communication is broken to all other tributaries.
- A spare control station modem equipped with the 4W-SNBU feature is installed on a spare port at the control station location. The spare control station can then establish a 4W-SNBU connection to any 3864 tributary modem equipped with the 4W-SNBU feature. This tributary is deactivated from its normal polling list and assigned to the spare port. The normal control station continues to provide service to other tributaries still reachable over the non-switched line.

This feature requires two 2-wire "switched" telephone lines, and two telephones at the host site. Attachment to the switched lines is made as described in the "Attachment to Facilities" section above. The feature is designed to automatically answer when a call is received. Calls must be placed manually. When one call is placed and the connection completed, a four minute timer is started. The second line must be established within the timeout, otherwise the first line is automatically dropped. **Field Installation:** Yes.

Special Feature Prices:		MRC	MLC/ 2 Yr	Purchase	MMMC
Fan Out	#3901	\$24	\$20	\$ 750	\$2.00
Ext Diagnostic Card	7930	9	8	275	1.50
4-Wire SNBU	7953	38	32	1,110	9.00

ACCESSORIES

The following items are available on a purchase only basis. Order the Feature # indicated below.

RACK MOUNT ADAPTER (#6240). A rack adapter that fastens inside a standard 19 inch EIA rack. The adapter is a shelf with an inside width of 17-3/8 inches (441.3 mm) which will allow two standalone modems to be placed side by side. The adapter will fit racks with depths of 23-5/8 to 30 inches (600 to 760 mm). **Field Installation:** Yes.

TAIL CIRCUIT ATTACHMENT (TCA) (#7875). [Mdl 1 only] Allows the 3864 mdl 1 to attach to a 3865 Modem mdl 1 (9600 bps) equipped with Data Multiplexing (#3260). Permits an extension of a network via a separate set of modems and a separate communications channel. **Limitations:** No LPDA support on tailed circuit attachments ... 3864 mdl 1s in point to point or multipoint control mode only. **Field Installation:** Yes.

Rack Mount Adapter	#6240	\$70
Tail Circuit Attachment	7875	45

**IBM 3865 MODEM**

Purpose: A 9600 bps modem used to provide communication products with a means for transmitting data over telecommunication channels (normally telephone lines).

An advanced microprocessor-based modem which significantly enhances communication network management and network problem determination.

The modem diagnostic functions operate with Network Problem Determination Application (NPDA) Release 2, providing:

- Probable cause of network errors.
- Alert messages on error threshold.
- Formatted modem test results.

Operation: The 3865 operates in half-duplex or duplex mode over 4-wire non-switched duplex facilities.

Model 1 Operates in point-to-point mode.

Model 2 Operates in multipoint mode and can be configured as a multipoint control or as a multipoint tributary station.

Model Changes: Available at time of manufacture only.

Highlights - Standard Features

- A microprocessor for signal processing.
- Automatic Remote Speed Selection - the transmission speed of the remote modem follows the transmission speed (9600/4800 bps) of the local modem (primary status). The network configuration of the remote modem must be secondary.
- Anti-Streaming - a multipoint tributary 3865 mdl 2 can automatically cut off transmission if a terminal holds "Request to Send" up longer than 40 seconds (an abnormal condition in IBM communication protocol). Customer switch option.
- Automatic and Adaptive Equalization - equalization is automatically performed by the modem and continues to adapt in data mode.
- Operator Panel with operational status and data quality (Good, Poor) indications.
- The modem diagnostics referred to as Link Problem Determination Aid (LPDA) operate with Systems Network Architecture (SNA) and associated program products. Under control of these programs, the modems accept commands and initiate tests that can help isolate problems to the line, local or remote modem, or elsewhere in the network and provide the network operator with the most probable cause of network problems. These program products are:
 1. Network Communication Control Facility (NCCF) Release 1 - (PP 5735-XX6)
 2. Network Problem Determination Application (NPDA) Release 2 - (PP 5735-XX8)
 3. ACF/NCP Release 2.1 - (PP 5735-XX1)
- Modem provides its own clocking or will accept DTE (external) clocking.
- Fast RFS - 24 millisecond Ready For Sending (RFS) Delay available for 3865 multipoint tributary modems. Customer switch option (24 msec or 60 msec).
- Both point to point and multipoint can operate over 3002 Basic (unconditioned) channels.
- Protective circuits required for FCC Registration in U.S. when 4-Wire SNBU (#7953) is installed are built into the 3865 modem (conditional upon FCC Registration).

Highlights - Optional ... see "Special Features" and "Accessories."

- 4-wire Switched Network Backup (SNBU) a special feature which provides for non-switched telecommunications facility.
- Fan Out - this special feature allows attachment of up to three teleprocessing machines to one modem.
- Rack Mount Adapters (Accessories) are available.
- Extended Diagnostic Card - a special feature which indicates remote modem power loss. Used with NPDA, it expands the problem determination capability. See IBM Program Product 5735-XX8.
- Data Multiplexing - a special feature available on the model 1 which allows selection of 4800 and 2400 bps subchannels. The modem multiplexes subchannel data into a single aggregate data stream on 3865 mdl 1s.
- Auto Answer - automatic answering of switched network calls with SNBU.

Data Rate: 9600 bps with back-up of 4800 bps (half speed).

Link Problem Determination Aid Diagnostic Tests: All modems will respond to diagnostic commands from the system that help provide status of any modem in the link, its attached terminal, and the quality of the received signal over the communication facility. Test requests and responses utilize the same data path and controls that are used by the S/370 or 4300 processor for data transmission. Thus diagnostic status/test requests can be interspersed with data requests without interrupting terminal sessions.

The Network Problem Determination Application (NPDA) program product provides functions for the collection, storage, and retrieval of network error/management data. NPDA implemented under the Network Communication Control Facility (NCCF) program product has both summary and detailed level information for determining probable cause of network errors. Probable cause differentiates between errors in the communications controller, line, modem, modem interface, or terminals.

NPDA will also utilize the new modem facilities to provide alert messages on error threshold and display formatted modem test results.

In addition, tests can be executed from the modem operator panel. These manual tests include:

Modem Self Test - this includes an extensive test of modem microcode, plus a data wrap with reduced thresholds for received data.

Modem/Line Transmit and Receive Tests - allow testing of modem and line for switched network.

Local Loop-back Test - provides a "wrap" or loop-back at the line interface to allow terminal wrap tests through the modem.

Remote Loop-back Test - provides a "wrap" or loop-back at the remote modem to allow a DTE wrap test through the local modem for non-switched modems. This test does not require remote operator assistance.

Loop Test - allows an end-to-end test to any modem on the link without remote operator assistance. This test is only available when operating over 4-wire telecommunication facilities.

Lamp Test - tests all the indicator lights on the operator panel.

Link Problem Determination Aid (LPDA) Diagnostic Tests - all 3865 modems will respond to diagnostic commands from the system to provide the status of any modem in the link, its attached terminal, or the quality of the received signal over the communication facility. Test requests and responses utilize the same data path and controls that are used by S/370 and 4300 processors for data transmission. Thus diagnostic status/test requests can be interspersed with data requests without interrupting terminal sessions. See LPDA in "Highlights" for required S/370 Program Product support.

Customer Setup: The 3865 is designated for Customer Setup (CSU). This provides the customer with early availability and also allows relocation of the unit without requiring IBM service personnel assistance. All switches will be set at the plant from customer order information. Switched network transmit level switches will not be accessible to customers.

"Setup Switches" are provided on the rear panel to allow reconfiguration of the modem where application needs change. For example, 3865 mdl 2s may be set for multipoint control, or multipoint tributary operation via the setup switches. NOTE: Some of these changes may require SYSGEN changes in the program support.

Communications Facilities

Common Carrier Facilities: Voiceband private line (non-switched) channel, type 3002 (or equivalent), as described in the Bell System Technical Reference PUB 41004, dated October 1973.

Model 1 (point to point) and model 2 (multipoint) use basic channels. The 3865 will operate on most unconditioned lines and provide satisfactory error rates. However, due to the wide range of line impairments allowed for unconditioned lines, it may be necessary to add to some lines the following line conditioning to achieve satisfactory performance at 9600 bps:

- Model 1 (point to point) may require D1 conditioning.
- Model 2 (multipoint) may require C1 and/or, in extreme cases, D2 conditioning. An alternate that is effective in most cases is to activate a longer (60 ms) RFS delay on tributary modems with a switch on the back panel. NOTE: Model 2 modems can operate on links with a mix of 24 ms and 60 ms RFS delays. In exceptional cases, even with 60 ms RFS it may require D2 conditioning to achieve acceptable performance at 9600 bps.

Privately Owned Communication Facilities: Equivalent to above.

International Facilities: Request your TP coordinator to contact the TP coordinators of the other countries involved to determine



3865 Modem (cont'd)

the availability of such facilities. Transmission of data between the United States and Canada on non-switched facilities is supported. (For non-switched operation, the channel in Canada must be a schedule 4, type 4.)

Attachment to Facilities

Attachment to a private line (non-switched) channel is by a cable, supplied with the 3865, which is terminated with a four prong plug (WE 283B or equivalent). The plug mates with a receptacle (WE 404B or 549A surface mount or 493A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communications equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.)

If the 3865 is equipped with 4-wire Switched Network Backup (#7953) two additional switched cables are also provided with that modem. Attachment to a switched line channel is by a cable supplied with the 3865, which is terminated with an 8 pin mini plug (USOC 45S or 41S) for insertion into the programmed data jack provided by the telecommunication service supplier.

When equipped with the 4-wire SNBU feature (#7953) the modem includes a protective coupler (conditional upon FCC Registration) which permits direct attachment to the U.S. Public Switched Network.

Related Equipment: The 3865 operates with IBM communication products capable of 9600 bps operation. See "Related Equipment" under "Specify." The 3865 must communicate with another appropriately configured 3865 unless multiplexing is used. The interconnecting cable between the machine and the modem must be supplied by the using machine.

Customer Responsibilities: The customer must be informed of his/her responsibilities as detailed in the M 2700 sales manual pages, and in the site preparation section of the Introduction and Site Preparation Guide, GA27-3200.

The customer is also responsible for:

- 1) Arrangements for price quotations, installation, and all costs of common carrier equipment and services.
- 2) Private Line (non-switched) Channel -- arranging for the telecommunication service supplier to provide a voice grade data channel. Also arranging for the installation of the appropriate receptacle described in "Attachment to Facilities" above.
- 3) Switched Telecommunication Network -- arranging for the telecommunication service supplier to install the appropriate communication service equipped with the required connecting device as described in "Attachment to Facilities" above and for attaching the IBM provided cable to the connecting device.
- 4) If the 3865 is to be attached to a non-IBM product, the interconnecting cable between the business machine and the modem must be supplied by the business machine.
- 5) Unpacking and placing of the 3865. Physical setup and connection of cables at setup time.
- 6) Notifying IBM of intent to relocate the unit, and for following IBM instructions for relocation.
- 7) Disconnecting, packing and removal to the customer's shipping dock at time of discontinuance. Appropriate instructions will be supplied by IBM.
- 8) All three of the following Program Products must be installed for LPDA to function.
 1. NCCF Release 1 (PP 5735-XX6)
 2. NPDA Release 2 (PP 5735-XX8)
 3. ACF/NCP Release 2.1 (PP 5735-XX1)

Bibliography: See KWIC Index G320-1621 or specific systems bibliography.

Publications:

- * IBM 3863, 3864 and 3865 Introduction and Site Preparation Guide, GA 27-3200
- * IBM 3865 User's Guide - available with shipment.

SPECIFY:

- * Voltage (120 V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug. If standard 10 ft (3 meter) power cable is not required, specify #9886 for 6 ft (1.8 meter) cable.

- * Telecommunications Cord (modem to communication line):
 - 10 ft (3 meters) specify #9710
 - 25 ft (7.5 meters) specify #9713

- * Related Equipment: one 3865 Attachment Feature Code from the table below must be specified for each 3865, depending upon the unit to which it is attached.

Machine	Feature #	Machine	Feature #
2701	9505	3776	9544
3271	9513	3777	9528
3274	9558	3791	9535
3275	9514	4331	9571
3276	9557	8101	9569
3601	9532	8130	9567
3602	9561	8140	9568
3632	9561	Non-IBM	9520
3704	9516	RPQ Machine	9524
3705	9515		

- * Operational Mode (one must be selected so that the modem can be shipped from the plant ready to install).

- Model 1 (point to point) -- one modem must be specified as LOCAL, and the other as REMOTE. Selection of one of these codes determines how the Automatic Remote Speed Selection feature in the modem will function:

Local Data Rate Control ... specify #9330 -- allows modem data rate to be changed by the "Full Speed/Half Speed" switch on the operator panel, or to the rate selected by its attached DTE through control of the "Data Rate Select" interface lead to the modem. This specify code should be used for modems located at the "System Host Location" end of this telephone line.

Remote Speed Selection ... specify #9331 -- allows modem to automatically adjust its data rate to the rate it is receiving data over the line. The modem will ignore the setting of its "Full Speed/Half Speed" switch.

- Model 2 (multipoint) -- selection of one of these codes determines the operating mode of the modem, and how data rate will be controlled:

Multipoint Control ... specify #9332 -- modem will operate as a multipoint control station in the multipoint network. The modem is automatically set to local data rate control.

Multipoint Tributary ... specify #9333 -- selects modem for operation as a tributary station in the multipoint network. Tributary stations are automatically designated for remote speed selection.

Note: The operational mode can be changed by switch setting.

PRICES	Mdl	MRC	MLC/ 2 Yr	Purchase	MMMC
3865	1	\$194	\$165	\$5,300	\$29.50
	2	194	165	5,300	29.50

Plan Offering: Plan D
 Warranty: B
 Purchase Option: 55%
 Termination Charge Percent: 25%
 Upper Limit Percent: 5%
 Initial Period of Maintenance Service Availability: 3 mos.

Machine Group: D
 Per Call: 1
 Useful Life Category: 2
 Termination Charge Months: 5



3865 Modem (cont'd)

SPECIAL FEATURES

DATA MULTIPLEXER (#3260). [Mdl 1 only] Allows selection of a 4800 bps and 2400 bps subchannel. The modem multiplexes subchannel data into a single aggregate data stream. This feature offers four channel configurations. When the 3865 is placed in half speed mode, the aggregate data stream is transmitted at half speed and as a result the channel configurations will be automatically altered because of lower speed. Channel configurations are:

Channels				Half Speed Operation			
A	B	C	D	A	B	C	D
9600	--	--	--	4800	--	--	--
4800	4800	--	--	4800	--	--	--
4800	2400	2400	--	4800	--	--	--
2400	2400	2400	2400	2400	2400	--	--

All data sources are connected to the 3865 mdl 1 by separate EIA/CCITT interfaces. Multiplexer channels will permit attachment to co-located terminals or tailed circuit extensions for network flexibility and cost savings. Tail circuit extensions allow co-located modems (3863 or 3864) to be attached to a 3865 channel. Modems so attached can extend the channel data path by its attached communications line and a second (remotely attached) modem. Each multiplexer channel is equipped with buffers to compensate for timing variations between tailed modems and the 3865 clocks. The tailing accessory (#7875) is required on the 3863 or 3864 modems when attached. **Limitations:** If 3863 and 8364 "tailed" modems are attached they must be mdl 1s operating in point to point or multipoint control mode only. No LPDA support is available. **Field Installation:** Yes.

FAN OUT (#3901). Allows attachment of up to three teleprocessing machines to one 3865 ... see "Related Equipment" under "Specify" for applicable machines. Only one of the attached machines may transmit at a time. This feature may be used at a tributary station in a centralized multipoint network. In this configuration, multipoint programming discipline will provide the selection/control of the specified IBM terminals without any additional user involvement.

This feature may also be used to allow up to three of the specified IBM Multiplexers or Communications Controllers at a central site to share the same 3865 modem for backup purposes. In this case, although all of the machines attached to the 3865 will receive the incoming data simultaneously, the user switchover procedure must ensure that only one machine is sending. **Limitation:** Cannot be installed with DTE (external) clock. **Field Installation:** Yes.

EXTENDED DIAGNOSTIC CARD (#7930). Used to give a remote modem power loss indication. The feature must be installed on the local and remote modems. The feature card in the remote modem detects the loss of DC power and signals it with an "out-of-band" tone to the local feature card. **Prerequisites:** #7930 must be installed in both the local and remote modems ... also see LPDA in "Highlights" for required Program Product support. **Field Installation:** Yes.

4-WIRE SWITCHED NETWORK BACKUP (4W-SNBU) (#7953). Provides backup for the non-switched telecommunication facility. Data rate in 4W-SNBU mode is the same as in normal non-switched line mode. 4W-SNBU allows restoration of the 4-wire service between two point to point or multipoint 3865s. For point to point configurations, except for the requirement to establish the switched connections, 4W-SNBU allows continuation of service with no operational or programming impact.

For multipoint configurations, operational (and possibly programming) modifications are required. 4W-SNBU can be configured in two ways:

- The 4W-SNBU feature is installed on the normal multipoint control station modem and on any tributary modems that require backup. To establish a backup path to any tributary, the control station modem must go to SNBU mode. In doing so, communication is broken to all other tributaries.
- A spare control station modem equipped with the 4W-SNBU feature is installed on a spare port at the control station location. The spare control station can then establish a 4W-SNBU connection to any 3865 tributary modem equipped with the 4W-SNBU feature. This tributary is deactivated from its normal polling list and assigned to the spare port. The normal control station continues to provide service to other tributaries still reachable over the non-switched line.

This feature requires two 2-wire "switched" telephone lines, and two telephones at the host site. Attachment to the switched lines is made as described in the "Attachment to Facilities" section above. The feature is designed to automatically answer when a call is received. Calls must be placed manually. When one call is placed and the connection completed, a four minute timer is started. The second line must be established within the time-out, otherwise the first line is automatically dropped. **Limitations:** It

may be necessary to re-dial or change to half speed to maintain acceptable performance in SNBU mode. See customer responsibilities section of M 2700 pages for details. **Field Installation:** Yes.

Special Feature Prices:	MRC	MLC/ 2 Yr	Purchase	MMMC
Data Multiplexer	#3260 \$35	\$30	\$1,010	\$4.00
Fan Out	3901 24	20	750	2.00
Ext Diagnostic Card	7930 9	8	275	1.50
4-Wire SNBU	7953 38	32	1,110	9.00

ACCESSORIES

The following item is available on a purchase only basis. Order the feature number indicated below.

RACK MOUNT ADAPTER (#6240). A rack adapter that fastens inside a standard 19 inch EIA rack. The adapter is a shelf with an inside width of 17-3/8 inches (441.3 mm) which will allow two standalone modems to be placed side by side. The adapter will fit racks with depths of 23-5/8 to 30 inches (600 to 760 mm). **Field Installation:** Yes.

Rack Mount Adapter	#6240	\$70
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**IBM 3872 MODEM**

Purpose: A 2400 bps modem, with half-speed capability, used to provide communications products with the means for transmitting data over common carrier provided voiceband private line (non-switched) channels, equivalent privately owned channels or switched telecommunication networks.

Highlights: Modem operation is possible in half-duplex mode over 2- or 4-wire half-duplex facilities, half-duplex or duplex mode over duplex facilities, or half-duplex mode over switched telecommunication networks.

Data Rates -- 2400 bps with back-up half-speed.

Equalization -- manually adjustable by operator on private line (non-switched) channels and automatic on switched networks.

Operation -- switched network or multipoint control, multipoint tributary, point-to-point on a private line (non-switched) channel. See "Special Features."

Built-in Diagnostics -- included in each modem are the following diagnostic features accessible to the operator: (1) The modem may be *WRAP TESTED* independently of the using machine and telecommunication channel ... (2) It may be *LINE TESTED* with a remote modem and telecommunication channel, independently of the attached business machine. The test may be one way or remotely wrapped to the local modem.

Communications Facilities: Communication common carrier provided voiceband private line (non-switched) channel, type 3002 (or equivalent) as described in the Bell System Technical Reference PUB 41004, dated Oct., 1973. **NOTE:** Machines with a serial number prior to 13100 and a suffix prior to HZ with Multipoint Tributary (#5101, 5102) or Point-to-point (#6101, 6102) feature require the installation of an RPQ to operate on a basic (not conditioned) 3002 channel. Machines shipped from the plant after June 1, 1976, do not require the RPQ. Conditioned lines may be used but are not required.

Privately Owned Communications Facilities -- equivalent to above.

Public Switched Networks

The customer must be advised that satisfactory data transmission depends upon the characteristics of the particular switched network connection being used. Refer to M 2700 pages for further details.

International Facilities: Transmission of data between the United States and Canada on non-switched or switched facilities is supported. (For non-switched operation, the channel in Canada must be a schedule 4, type 4.)

Attachment to Facilities: Attachment to a private line (non-switched) channel is by a cable, supplied with the 3872, which is terminated with a four prong plug (WE 283B or equivalent). The plug mates with a receptacle (WE 404B or 549A surface mount or 493A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communications equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.)

If the 3872 is equipped with Switched Band Network Back-up (#7951), another cable is supplied with the feature. This cable is also terminated with a four prong plug and requires the aforementioned type of receptacle which is connected to the Data Access Arrangement CDT (WE 1000A or equivalent).

If the 3872 is equipped with Switched Network (#7941, #7942) or Switched Network Back-up with Automatic Answer (#7952) a cable is supplied with the feature which is terminated with spade lugs for connection to the Data Coupler CBS (WE 1001A, series 5 or later, or WE 1001F, or equivalent).

Related Equipment: The 3872 operates with IBM communications products capable of 2400 bps operation ... see "Related Equipment" under "Specify." Modem clocking must be used. The IBM 3872 Modem must communicate with another appropriately equipped 3872, or with an appropriately equipped IBM 2400 bps Integrated Modem. The interconnecting cable between the business machine and the modem must be supplied by the business machine. If the 3872 is equipped with the Automatic Call Originate (#1091) feature, the interconnecting Auto-Call cable between the business machine and the modem must be supplied by the business machine.

Customer Responsibilities: The customer must be informed of his responsibilities as detailed in the M 2700 pages and in the Installation Planning section of the 3872 User's Guide, GA27-3058. The customer is responsible for:

- (1) Private line (non-switched) channel -- arranging for the telecommunication service supplier to provide a type 3002 voice grade data channel (or equivalent) as described under

"Communications Channel Specifications" in the 3872 User's Guide. Also arranging for the installation of the appropriate receptacle described in "Attachment to Facilities."

- (2) Switched Telecommunication Network -- arranging for the telecommunication service supplier to install the appropriate communication service equipped with the required connecting device as described in "Attachment to Facilities" and for attaching the IBM provided cable to the connecting device.

Also inform the telecommunication service supplier that the speed of data transmission will be 2400 bps and that appropriate conditioning of the local loop is required. The customer must be made aware that the use of local loops not properly conditioned for the speed of data transmission or the use of special switched facilities may result in unsatisfactory data transmission.

- (3) Providing voice communications between modems to coordinate tests or re-equalization. The voice facility can be provided by the 3872 Alternate Voice feature. Information concerning the handset for the Alternate Voice feature is described in the 3872 Modem User's Guide. The voice facility must be located such that an operator can use it while operating the controls on the front of the modem.
- (4) If the 3872 is to be attached to a non-IBM product, the interconnecting cable between the business machine and the modem must be supplied by the business machine.
- (5) If the 3872 is equipped with the Automatic Call Originate feature (#1091), the interconnecting Auto-Call cable between the business machine and the modem must be supplied by the business machine.

Bibliography: See KWIC Index G320-1621 or specific System bibliography.

Publication: IBM 3872 User's Guide, GA27-3058

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, #9886 for 230 V ... Non-lock plug -- #9881 for 115 V, #9885 for 208 V, #9887 for 230 V.

- [2] Telecommunication Cord (modem to telecommunication facility): Specify one of the following for each telecommunication channel or network connection;

#9750 -- Telecommunication cord to connect a basic (control station) 3872 modem, or one equipped with Multipoint Tributary (#5101), or Point-to-Point (#6101) feature, to a private line (non-switched) channel.

#9751 -- Telecommunication cord to connect a basic (control station) 3872 Second Modem (#6302) or second modem equipped with Multipoint Tributary (#5102), or Point-to-Point (#6102) feature, to a private line (non-switched) channel.

#9752 -- Telecommunication cord to connect a 3872 modem equipped with Switched Network (#7941) to a switched telecommunication network.

#9753 -- Telecommunication cord to connect a 3872 Second Modem (#6302) equipped with Switched Network (#7942) to a switched telecommunication network.

#9754 -- Telecommunication cord to connect a 3872 modem equipped with Switched Network Back-up (#7951) or Switched Network Back-up with Automatic Answer (#7952) to a switched telecommunication network.

A 10-foot cable will be supplied. If a longer cable is required, indicate 15, 20 or 25 feet as the quantity of the feature # specified. **NOTE:** orders to add the Switched Network Back-up feature(s) (#7951 or #7952), to convert a private line (non-switched) channel modem to Switched Network, or to convert a Switched Network modem to private line (non-switched) channel must include the telecommunication cord specify number(s) compatible with the resultant modem configuration.

- [3] Related Equipment: one 3872 Attachment Feature Code from the table below must be specified for each 3872, depending upon the unit to which it is attached. **NOTE:** For attachment to 1130, System/3, System/32, System/34, S/360 mdl 20, 5010, 5110 or 5230, refer to General System Division.



3872 Modem (cont'd)

3872		3872	
Machine	Attachment #	Machine	Attachment #
1826	#9502	3631, 3632	#9560
2025	9504	3651-25/50/75	9534
2701	9505	3684	9572
2703	9506	3704	9516
2715-2	9507	3705	9515
2772	9508	3735	9517
2780	9509	3741-2/4	9526
2845	9510	3747	9526
2848	9511	3767	9537
3115	9527	3771	9540
3125	9525	3773	9541
3135, 3135-3	9512	3774	9542
3138	9550	3775	9543
3271	9513	3776	9544
3274	9558	3777	9528
3275	9514	3780	9521
3276	9557	3791	9535
3601,3602	9532	4331	9571
3614	9533	8101	9509
Non-IBM	9520	8130	9567
RPQ Machines	9524	8140	9568

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
3872	1	\$ 94	\$2,575	\$25.00

Plan Offering: Plan B Warranty: B Maintenance: B
Purchase Option: 50% Useful Life Category: 2 Per Call: 2

SPECIAL FEATURES

The basic 3872 Modem, with no additional feature required, is used at the control station in a centralized multipoint network. Additional capabilities/configurations are provided by the following features.

ALTERNATE VOICE (#1051, 1052). Provides signalling capability and a socket on the operator panel into which a customer provided handset may be plugged permitting voice communications with the distant 3872 Modem(s). Data cannot be simultaneously transmitted with voice. A handset is not provided. See 3872 User's Guide for description of handset. #1051 -- for basic modem ... #1052 -- for Second Modem (#6302). **Maximum:** One of each. **Limitations:** #1051 cannot be installed with Switched Network (#7941) ... #1052 cannot be installed with Switched Network (#7942). **Field Installation:** Yes. **Prerequisites:** #1052 requires Second Modem (#6302).

AUTOMATIC CALL ORIGINATE (#1091). Permits automatic origination of a call by the using machine equipped with an IBM autocall feature. Provides control to the common carrier Data Coupler Type CBS (or equivalent) to dial telephone numbers and to provide on-hook/off-hook control. **Note:** Can only be used with Rotary Dial System. **Maximum:** One. **Limitation:** Cannot be installed with Second Modem (#6302) or Switched Network Back-up (#7951, 7952). **Field Installation:** Yes. **Prerequisites:** Switched Network (#7941) on 3872 and an IBM Auto Call feature on the using machine.

FAN-OUT (#3901). This feature allows attachment, to the 3872, of up to three IBM Teleprocessing Machines at one location ... see Specify [3] for applicable machines. Only one of the attached machines may transmit at a time.

This feature may be used at a tributary station in a centralized multipoint network. In this configuration, multipoint programming discipline will provide the selection/control of the specified IBM terminals without any additional user involvement.

This feature may also be used to allow up to three of the specified IBM Multiplexers, Communications Controllers, Integrated Communications Adapters, or Communications Adapters on 4331s at a central site to share the same 3872 Modem for back-up purposes. In this case, although all of the machines attached to the 3872 will receive the incoming data simultaneously, the user switchover procedure must ensure that only one machine is sending. **Maximum:** One. **Limitations:** Cannot be installed with Second Modem (#6302) or Switched Network (#7941). **Field Installation:** Yes.

MULTIPOINT TRIBUTARY (#5101, 5102). Used on each modem attached to tributary stations in a centralized multipoint network to compensate for line distortion between the control and tributary station. Operator adjustment on front panel. #5101 -- for basic modem ... #5102 -- for Second Modem (#6302). **Maximum:** One of each. **Limitation:** #5101 cannot be installed with Point-to-Point (#6101) or Switched Network (#7941) ... #5102 cannot be installed with Point-to-Point (#6102) or Switched Network (#7942). **Specify:** Telecommunication cord #9750 for feature #5101 ... Telecommunication cord #9751 for feature #5102. **Field Installation:** Yes. **Prerequisite:** #5102 requires Second Modem (#6302).

POINT-TO-POINT (#6101, 6102). Used on modems at each end of a point-to-point private line (non-switched) channel to compensate for line distortion. #6101 -- for basic modem ... #6102 -- for Second Modem (#6302). **Maximum:** One of each. **Limitation:** #6101 cannot be installed with Multipoint Tributary (#5101) or Switched Network (#7941) ... #6102 cannot be installed with Multipoint Tributary (#5102) or Switched Network (#7942). **Specify:** Telecommunication cord #9750 for feature #6101 ... Telecommunication cord #9751 for feature #6102. **Field Installation:** Yes. **Prerequisite:** #6102 requires Second Modem (#6302).

SECOND MODEM (#6302). Permits two modems, each to operate on a separate line, to be housed in the same stand-alone cabinet. The two modems share the same power supply. **Maximum:** One. **Limitation:** Only the following features are allowed on either or both modems -- Alternate Voice (#1051, 1052), Point-to-Point (#6101, 6102), Multipoint Tributary (#5101, 5102), or Switched Network (#7941, 7942). **Field Installation:** Available at time of manufacture only.

SWITCHED NETWORK (#7941, 7942). Used for operation over public switched network via the common carrier Data Coupler type CBS (or equivalent). Automatic answering of incoming calls will be performed by the modem. Automatic equalization is effected at the beginning of each call. #7941 -- for basic modem ... #7942 -- for Second Modem (#6302). Conditioning of the telecommunication service local loop for transmission of data faster than 300 bps is required. It can communicate with another 3872 equipped with Switched Network (#7941 or #7942), with Switched Network Back-up (#7951) or with Switched Network Back-up with Automatic Answer (#7952). **Maximum:** One of each. **Limitations:** #7941 cannot be installed with Alternate Voice (#1051), Fan-Out (#3901), Multipoint Tributary (#5101), or Point-to-Point (#6101) ... #7942 cannot be installed with Alternate Voice (#1052), Multipoint Tributary (#5102), or Point-to-Point (#6102). **Specify:** Telecommunication cord #9752 for feature #7941 ... Telecommunication cord #9753 for feature #7942. **Field Installation:** Yes. **Prerequisite:** #7942 requires Second Modem (#6302).

SWITCHED NETWORK BACK-UP (#7951). Provides the capability of attaching the 3872 to the public switched network as a back-up to the private line (non-switched) channel. It can communicate with another 3872 equipped with Switched Network (#7941 or #7942), with Switched Network Back-up (#7951), or with Switched Network Back-up with Automatic Answer (#7952). A fixed compromise equalizer is provided for the back-up operation. A front panel switch permits operator selection of either the prime or the back-up facility. Both facilities cannot be used simultaneously.

Attachment to the switched network is made via the common carrier Data Access Arrangement type CDT (or equivalent). Calls must be established and answered manually. **Note:** To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the using system/terminal.

This feature can be used with BTAM programs for DOS, DOS/VS, OS, OS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required, in existing BTAM programming, to fully utilize the capabilities of the Switched Network Back-up feature. For additional information, see the 3872 User's Guide. Conditioning of the telecommunication service local loop for transmission of data faster than 300 bps is required. **Maximum:** One. **Limitations:** Cannot be installed with Second Modem (#6302), or Switched Network features (#7941, 7942 or 7952). **Specify:** Telecommunication cord #9754. **Field Installation:** Yes.

SWITCHED NETWORK BACK-UP WITH AUTOMATIC ANSWER (#7952). Same as Switched Network Back-up (#7951) plus the added capability of automatically answering incoming calls when attached to a common carrier Data Coupler type CBS (or equivalent). **Note:** To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the using system/terminal.

This feature can be used with BTAM programs for DOS, DOS/VS, OS, OS/VS1 and OS/VS2 in certain configurations. Additional customer routines will be required, in existing BTAM programming, to fully utilize the capabilities of the Switched Network Back-up feature. Conditioning of the telecommunication service local loop for the transmission of data faster than 300 bps is required. For additional information, see the 3872 User's Guide. **Maximum:** One. **Limitations:** Cannot be installed with Second Modem (#6302), or Switched Network features (#7941, 7942 or 7951). **Specify:** Telecommunication cord #9754. **Field Installation:** Yes.

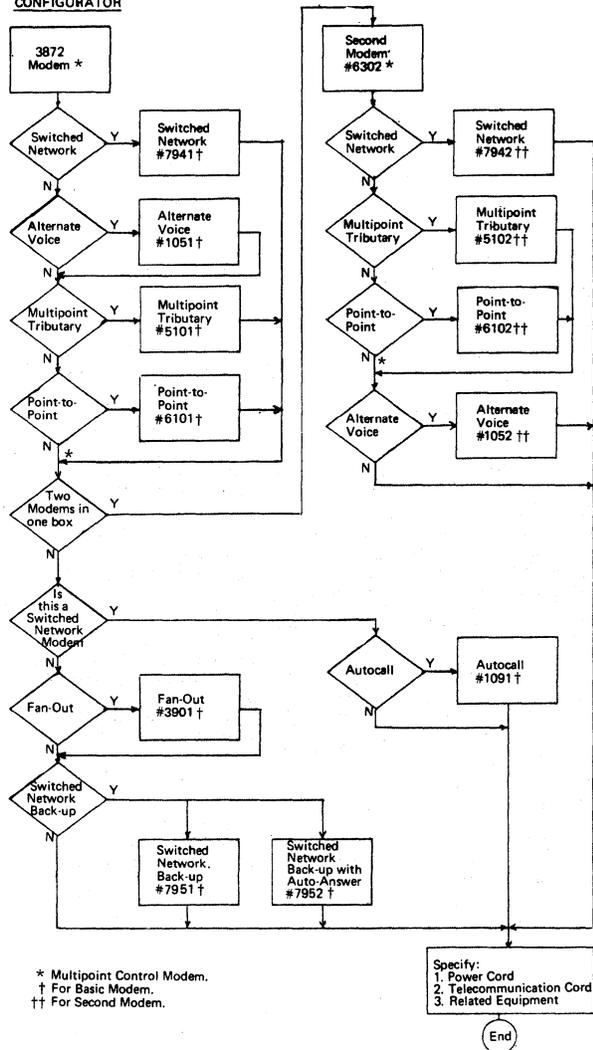


3872 Modem (cont'd)

Special Feature Prices:

		MAC/ MRC	Purchase	MMMC
Alternate Voice - Basic	#1051	\$ 16	\$ 455	\$.50
Alternate Voice - Second	1052	16	455	.50
Automatic Call Originate	1091	33	910	9.50
Fan-Out	3901	21	607	1.00
Multipoint Tributary - Basic	5101	15	424	3.50
Multipoint Tributary - Second	5102	15	424	3.50
Point-to-Point - Basic	6101	7	212	1.50
Point-to-Point - Second	6102	7	212	1.50
Second Modem	6302	77	2,115	17.00
Switched Network - Basic	7941	16	455	9.00
Switched Network - Second	7942	16	455	9.00
Switched Network Back-up	7951	10	303	3.50
Switched Network Back-up with Automatic Answer	7952	16	455	4.00

CONFIGURATOR



**IBM 3874 MODEM**

Purpose: A 4800 bps modem, with half-speed capability, used to provide communications products with the means for transmitting data over common carrier provided voiceband private line (non-switched) channels, equivalent privately owned channels or switched telecommunication networks.

Highlights: Modem operation is possible in half-duplex or duplex mode over 4-wire duplex facilities or half-duplex over 2-wire switched telecommunication networks.

Data Rates: 4800 bps with back-up half speed.

Equalization: Automatic.

Operation: Switched network or multipoint control, multipoint tributary, point-to-point on a private line (non-switched) channel. See "Special Features."

Built-in Diagnostics: Included in each modem are the following diagnostic features accessible to the operator: (1) The modem may be *WRAP TESTED* independently of the using machine and telecommunication channel ... (2) It may be *LINE TESTED* with a remote modem and telecommunication channel, independently of the attached business machine. The test may be one way or remotely wrapped to the local modem ... (3) Facility is provided to allow the attached machine to initiate a local wrap test independently from the telecommunication channel via an interface lead.

Communications Facilities: Communications common carrier provided voiceband private line (non-switched) channel, type 3002, with C1 conditioning (or equivalent) as described in the Bell System Technical Reference PUB 41004 dated Oct., 1973.

Privately Owned Communications Facilities: Equivalent to above.

Public Switched Telecommunication Networks: The customer must be advised that satisfactory data transmission depends on the characteristics of the switched network connection being used ... see M 2700 pages for further details.

International Facilities: Transmission of data between the United States and Canada on non-switched or switched facilities is supported. (For non-switched operation, the channel in Canada must be a schedule 4, type 4, with 4A conditioning.)

Attachment to Facilities: Attachment to a private line (non-switched) channel is by a cable, supplied with the 3874, which is terminated with a four prong plug (WE 283B or equivalent). The plug mates with a receptacle (WE 404B or 549A surface mount or 439A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communication equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.)

If the 3874 is equipped with Switched Network Back-up (#7951) another cable is supplied with the feature. This cable is also terminated with a four prong plug and requires the aforementioned type of receptacle which is connected to the Data Access Arrangement CDT (WE 1000A or equivalent).

If the 3874 is equipped with Switched Network (#7941) or Switched Network Back-up with Automatic Answer (#7952) a cable is supplied with the feature which is terminated with spade lugs for connection to the Data Coupler CBS (WE 1001A series 5 or later or WE 1001F or equivalent).

Related Equipment: The 3874 operates with IBM communications products capable of 4800 bps ... see "Related Equipment" under "Specify." Modem clocking must be used. The 3874 modem must communicate with another appropriately configured 3874 or IBM 4800 bps Integrated Modem. The interconnecting cable between the business machine and the modem must be supplied by the business machine. If the 3874 is equipped with the Automatic Call Originate feature (#1091), the interconnecting Auto Call cable between the attached machine and the modem must be supplied by the attached machine.

Customer Responsibilities: The customer must be informed of his responsibilities as detailed in the M 2700 pages and in the Installation Planning Section of the 3874 User's Guide, GA33-0002. The customer is responsible for:

- (1) Private line (non-switched) channel -- arranging for the telecommunication service supplier to provide a type 3002 voice grade data channel with C1 conditioning (or equivalent) as described under "Communication Channel Specifications" in the 3874 User's Guide. Also arranging for the installation of the appropriate receptacle described in "Attachment to Facilities."
- (2) Switched Telecommunication Network -- arranging for the telecommunication service supplier to install the appropriate communication service equipped with the required connecting device as described in "Attachment to Facilities."

Also inform the telecommunication service supplier that the speed of data transmission will be 4800 bps and that appropriate conditioning on the local loop is required. The customer must be made aware that the use of local loops not properly conditioned for the speed of data transmission or the use of special switched facilities may result in unsatisfactory data transmission.

- (3) For attaching the IBM provided line cable to the common carrier provided Data Access Arrangements.
- (4) Providing voice communications between modems attached to non-switched lines to coordinate tests. This voice facility can be provided by 3874 Alternate Voice feature. Information concerning the handset for the Alternate Voice feature is described in the 3874 Modem User's Guide. The voice facility must be located such that an operator can use it while operating the controls on the front of the modem.
- (5) If the 3874 is to be attached to a non-IBM product, the interconnecting cable between the business machine and the modem must be supplied by the business machine.
- (6) If the 3874 is equipped with the Automatic Call Originate feature (#1091), the interconnecting Auto-Call cable between the business machine and the modem must be supplied by the business machine.

See M 2700 pages for additional customer responsibilities.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Publication: IBM 3874 Modem User's Guide, GA33-0002.

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Telecommunication Cord (modem to telecommunication facility): Specify one of the following for each connection to a private line (non-switched) channel and for each connection to a switched telecommunication network ... see "Attachment to Facilities."

#9750 -- Telecommunication cord to connect a 3874 modem provided with Point-toPoint (#6101), Multipoint Control (#5100), or Multipoint Tributary (#5101) features to a private line (non-switched) channel.

#9754 -- Telecommunication cord to connect a 3874 modem provided with Switched Network (#7941) or Switched Network Backup with Automatic Answer (#7952) features to a switched telecommunication network terminated by a Data Coupler type CBS.

#9752 -- Telecommunication cord to connect a 3874 modem provided with Switched Network Backup (#7951) to a switched telecommunication network terminated by a Data Access Arrangement type CDT.

A 10-foot cable will be provided as standard. If a longer cable is required, indicate 15, 20 or 25 feet as the quantity of the feature # specified. **Note:** orders to add the Switched Network Backup feature (#7951 or #7952) or to convert a non-switched modem to switched network or to convert a switched network to non-switched channel must include the telecommunication cord specify number(s) compatible with the resultant modem configuration.

[3] Related Equipment: one 3874 Attachment Feature # from the table below must be specified for each 3874, depending upon the unit to which it is to be attached. **NOTE:** For attachment to 1130, 5010, 5110, 5231, System/3, System/32, System/34, or S/360 mdl 20, refer to General Systems Division.



3874 Modem (cont'd)

3874		3874	
Machine	Attachment #	Machine	Attachment #
1826	#9502	3631/3632	#9560
2025	9504	3651-25/50/75	9534
2701	9505	3684	9572
2703	9506	3704	9516
2715-2	9507	3705	9515
2772	9508	3735	9517
2780	9509	3771	9540
3115	9527	3773	9541
3125	9525	3774	9542
3135,3135-3	9512	3775	9543
3138	9550	3776	9544
3271	9513	3777	9547
3274	9558	3780	9521
3275	9514	3791	9535
3276	9557	4331	9571
3601, 3602	9532	8101	9569
3614	9532	8130	9567
Non-IBM	9520	8140	9568
RPQ Machine	9524		

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3874	1	\$ 170	\$ 145	\$3,570	\$ 66

Plan Offering: B Warranty: B Maintenance: B
 Purchase Option: 50% Useful Life Category: 2 Per Call: 2
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%

SPECIAL FEATURES

Prerequisite: One of the following special features must be installed: Multipoint Control (#5100), Multipoint Tributary (#5101), Point-to-Point (#6101) or Switched Network (#7941).

MULTIPOINT CONTROL (#5100). Used on each modem attached to a control station in a centralized multipoint network. Provides for automatic equalization of the private line (non-switched) channel from up to six tributary stations. Operator controls on front panel. **Maximum:** One. **Limitations:** Cannot be installed with Point-to-Point (#6101), Multipoint Tributary (#5101), or Switched Network (#7941). **Specify:** Telecommunication cord #9750. **Field Installation:** Yes.

MULTIPOINT TRIBUTARY (#5101). Used on each modem attached to tributary stations in a centralized multipoint network. Provides for automatic equalization of the private line (non-switched) channel from the control station. Operator controls on front panel. **Maximum:** One. **Limitations:** Cannot be installed with Multipoint Control (#5100), Point-to-Point (#6101), or Switched Network (#7941). **Specify:** Telecommunication cord #9750. **Field Installation:** Yes.

POINT-TO-POINT (#6101). Used on modems at each end of a point-to-point private line (non-switched) channel. Provides automatic equalization of the channel. Operator controls on front panel. **Maximum:** One. **Limitations:** Cannot be installed with Multipoint Control (#5100), Multipoint Tributary (#5101), or Switched Network (#7941). **Specify:** Telecommunication cord #9750. **Field Installation:** Yes.

SWITCHED NETWORK (#7941). Used for operation over public switched network via the common carrier Data Coupler type CBS (or equivalent). Automatic answering of incoming calls will be performed by the modem. Automatic equalization is effected at the beginning of each call. It can communicate with another 3874 equipped with Switched Network (#7941), with Switched Network Back-up (#7951), or with Switched Network Back-up with Automatic Answer (#7952). Conditioning of the telecommunication service local loop for the transmission of data faster than 300 bps is required ... see "Customer Responsibilities." **Maximum:** One. **Limitations:** Cannot be installed with Alternate Voice (#1051), Multipoint Control (#5100), Multipoint Tributary (#5101), or Point-to-Point (#6101). See "Programming" section of sales manual for restricted configurations. **Specify:** Telecommunication cord #9754. **Field Installation:** Yes.

The following features are optional to enhance the modem function.

ALTERNATE VOICE (#1051). Provides signalling capability and a socket on the operator panel into which a customer provided handset may be plugged, permitting voice communications with the distant 3874 modem(s). Data cannot be simultaneously transmitted with voice. A handset is not provided. See 3874 User's Guide for description of handset. **Maximum:** One. **Limitations:** Cannot be installed with Switched Network (#7941) ... cannot be used when a non-switched line 3874 modem is in Switched Network Back-up operation. **Field Installation:** Yes.

AUTOMATIC CALL ORIGINATE (#1091). Permits automatic

origination of a call by using machine equipped with an IBM Auto Call feature. Provides control to the common carrier Data Coupler, type CBS (or equivalent) to dial telephone numbers and to provide on hook/off hook control. **Note:** Can only be used with Rotary Dial System. **Maximum:** One. **Limitations:** Cannot be installed with Switched Network Back-up (#7951), Switched Network Back-up with Automatic Answer (#7952), or Fan-out (#3901). **Field Installation:** Yes. **Prerequisites:** Switched Network (#7941) and an IBM Auto Call feature on the using machine.

FAN-OUT (#3901). This feature allows attachment to the 3874 of up to three IBM teleprocessing machines at one location. See "Specify" for applicable machines. Only one of the attached machines may transmit at a time. The feature may be used at a tributary station in a centralized multipoint network. In this configuration, multipoint programming discipline will provide the selection/control of the specified IBM terminals without any additional user involvement.

This feature may also be used to allow up to three of the specified IBM Multiplexers, Communications Controllers, Integrated Communications Adapters, or Communications Adapters on 4331s at a central site to share the same 3874 modem for back-up purposes. In this case, although all of the machines attached to the 3874 will receive the incoming data simultaneously, the user switchover procedure must ensure that only one machine is sending. **Maximum:** One. **Limitation:** Cannot be installed with Automatic Call Originate (#1091). Is supported with restrictions by 3704/3705 NCP ... see "Programming" section of sales manual. **Field Installation:** Yes.

SWITCHED NETWORK BACK-UP (#7951). Provides the capability of attaching the 3874 modem to a public switched network as a back-up to the prime leased facility. It can communicate at 4800/2400 bps with another 3874 equipped with Switched Network (#7941), Switched Network Back-up (#7951), or Switched Network Back-up with Auto Answer (#7952). Attachment to the switched network is made via the common carrier Data Access Arrangement type CDT (or equivalent). Calls must be established and answered manually.

Note: To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the using system/terminal.

This feature can be used with BTAM programs for DOS, DOS/VS, OS, OS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required in existing BTAM programming to fully utilize the capabilities of feature #7951. Conditioning of the telecommunication service local loop for the transmission of data faster than 300 bps is required ... see "Customer Responsibilities." **Maximum:** One. **Limitations:** Cannot be installed with Switched Network (#7941), Switched Network Back-up with Automatic Answer (#7952), or Automatic Call Originate (#1091). See "Programming" section in sales manual for restricted configurations. **Specify:** Telecommunication cord #9752. **Field Installation:** Yes.

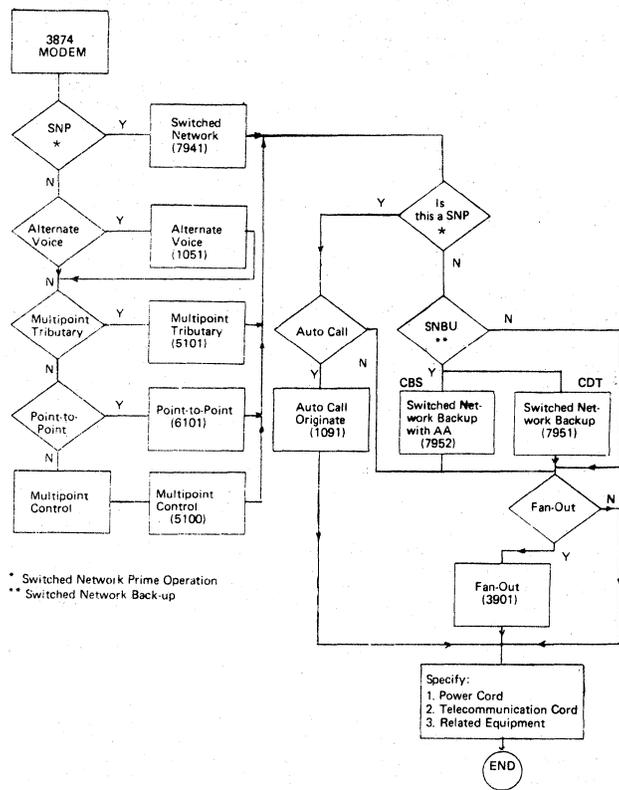
SWITCHED NETWORK BACK-UP WITH AUTOMATIC ANSWER (#7952). Same as Switched Network Back-up (#7951) plus the added capability of automatically answering incoming calls. Requires attachment to a common carrier Data Coupler type CBS (or equivalent). Conditioning of the telecommunication service local loop for the transmission of data faster than 300 bps is required ... see "Customer Responsibilities." **Note:** To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the using system/terminal. **Maximum:** One. **Limitations:** Cannot be installed with Switched Network (#7941), Switched Network Back-up (#7951), or Automatic Call Originate (#1091). See "Programming" section in sales manual for restricted configurations. **Specify:** Telecommunication cord #9754. **Field Installation:** Yes.

Special Feature Prices:		MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Alternate Voice	#1051	\$ 18	\$ 15	\$ 383	\$.50
Automatic Call Originate	1091	36	31	765	4.50
Fan-out	3901	29	25	638	2.00
Multipoint Control	5100	42	36	893	11.00
Multipoint Tributary	5101	18	15	383	5.50
Point-to-Point	6101	18	15	383	2.00
Switched Network	7941	36	31	765	6.00
Switched Network Bk-up	7951	24	20	510	4.50
Switched Network Back-up with Automatic Answer	7952	29	25	638	4.50



3874 Modem (cont'd)

CONFIGURATION



**IBM 3875 MODEM**

Purpose: Provides communications terminals with the means of transmitting data at 7200 bps, with half-speed capability, over common carrier provided voiceband private line (non-switched) channels, equivalent privately owned channels, or, at 3600 bps, with half-speed capability, over switched telecommunication networks as a back-up to the private line (non-switched) channel.

Highlights: Modem operation is possible in half-duplex or duplex mode over 4-wire duplex facilities or half-duplex mode with the Switched Network Back-up feature over switched telecommunication networks.

Data Rates -- 7200 bps with back-up half-speed on private line (non-switched) channels ... 3600 bps with back-up half-speed on switched telecommunication networks.

Equalization -- manually adjustable by an operator on private line (non-switched) channels. Fixed compromise on back-up switched telecommunication networks.

Operation -- Multipoint control, multipoint tributary, point-to-point on private line (non-switched) channel. Switched telecommunication network as a back-up to the private line (non-switched) channel. See "Special Features."

Built-in Diagnostics -- included in each modem are the following diagnostic features accessible to the operator:

- The modem may be *WRAP TESTED* independently of the using machine and telecommunication channel.
- The modem may be *LINE TESTED* with a remote end modem and telecommunication channel independently of the attached business machines. The test may be one way or remotely wrapped back to the local modem.

Communications Facilities: Communications Common Carrier provided voiceband private line (non-switched) channel, type 3002, with C2 conditioning (or equivalent) as described in the Bell System Technical Reference PUB 41004, dated Oct., 1973.

Normally the telecommunication service defined in the preceding statement provides for satisfactory operation of the 3875. However, there may be unusual circumstances where the channel characteristics exceed the tolerance level of the 3875. Where these characteristics cause an unacceptable error rate, the customer may request the telecommunication service supplier to provide D1 conditioning in addition to the C2 conditioning. D1 conditioning may not be available in some locations. For this situation the customer may request the telecommunication service supplier to provide alternate routing or special engineering effort.

D1 conditioning is *NOT* available under existing tariffs for multipoint networks. If an unacceptable error rate is encountered, the alternatives available to the customer are to request the telecommunication service supplier to provide re-routing or special engineering effort.

The telecommunication service supplier may not always be able to supply alternate routing or special engineering effort.

The operation of a multipoint network is more critical of line characteristics due to the cumulative effect of all the segments in the network. Actual performance cannot be accurately predicted but can only be established after the installation of the equipment.

The customer must be made aware of these exposures and the available alternatives prior to ordering the equipment. See M 2700 pages - "Customer Responsibilities."

Privately Owned Communications Facilities -- equivalent to above.

Public Switched Network

The customer must be advised that satisfactory data transmission depends on the characteristics of the switched telecommunication network connection being used ... see M 2700 pages for further details.

International Facilities: Transmission of data between United States and Canada is supported. (In Canada a Schedule 4, Type 4, channel with 4B conditioning is required. The equivalent of D1 conditioning is not available in Canada.)

Attachment to Facilities: Attachment to a private line (non-switched) channel is by a cable, supplied with the 3875, which is terminated with a four prong plug (WE 283B or equivalent). The plug mates with a receptacle (WE 404B or 549A surface mount or 493A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communication equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.)

If the 3875 is equipped with Switched Network Back-up (#7951) another cable is supplied with the feature. This cable is also terminated with a four prong plug and requires the aforementioned type

of receptacle which is connected to the Data Access Arrangement type CDT (WE 1000A or equivalent).

If the 3875 is equipped with Switched Network Back-up with Automatic Answer (#7952) a cable is supplied with the feature which is terminated with spade lugs for connection to the Data Coupler type CBS (WE 1001A series 5 or later or WE 1001F or equivalent).

Related Equipment: The 3875 Modem operates with the binary synchronous control adapters of the IBM machines listed in the table under "Specify." Modem clocking must be used. See M 2700 pages for facilities description.

Customer Responsibilities: The customer must be informed of his responsibilities as detailed in the M 2700 pages and in the Installation Planning section of the 3875 User's Guide, GA33-0001. The customer is responsible for:

- (1) Private line (non-switched) channel -- arranging for the communication common carrier to provide a voiceband private line (non-switched) channel, type 3002, with C2 conditioning as defined in the Bell System Technical Reference PUB 41004 "Data Communications Using Voiceband Private Line Channels" (October, 1973). Arrange for the installation of the appropriate receptacle described in "Attachment to Facilities."
- (2) Public switched telecommunication network -- arranging for the telecommunication service supplier to install the appropriate communication service equipped with the required connecting device as described in "Attachment to Facilities" and for attaching the IBM provided cable to the connecting device.
Also inform the telecommunication service supplier that the speed of data transmission will be 3600 bps and that appropriate conditioning of the local loop is required. The customer must be made aware that the use of local loops not appropriately conditioned for the speed of data transmission or the use of special switched facilities may result in unsatisfactory data transmission.
- (3) Providing voice communications between control and tributary stations to coordinate test or re-equalize. This voice facility can be provided by the Alternate Voice feature. Information concerning the handset for the Alternate Voice feature is described in the 3875 Modem User's Guide.
- (4) When the 3875 is to be attached to other than an IBM machine, that business machine must provide the interconnecting cable between the connector or digital equipment and the modem.

PREREQUISITE: See "Teleprocessing Systems" in GI section of sales manual.

Bibliography: GA24-3089

Publication: IBM 3875 User's Guide, GA33-0001.

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): For locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. For non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Telecommunication Cord (modem to telecommunication facility): Specify one of the following for each connection to private line (non-switched) channel or to a switched telecommunication network.

- #9750 Telecommunication cord to connect a 3875 modem to a private line (non-switched) channel.
- #9031 Telecommunication cord to connect a 3875 modem equipped with Switched Network Back-up (#7951) to a switched telecommunication network.
- #9032 Telecommunication cord to connect a 3875 modem equipped with Switched Network Back-up with Automatic Answer (#7952) to a switched telecommunication network.

A 10 foot cable will be supplied as standard. If a longer cable is required, indicate 15, 20 or 25 feet as a quantity of the feature number specified. **NOTE:** orders to add Switched Network Back-up (features #7951, #7952) must include the telecommunication cord specify number for the appropriate cord.

[3] Related Equipment Attachment: one 3875 attachment feature must be specified with each 3875 order. **NOTE:** For attachment to System/3, System/32, System/34 and S/360 mdl 20, see General Systems Division.



3875 MODEM (cont'd)

Machine	3875 Attachment #	Machine	3875 Attachment #
2701	#9505	3275	#9514
2703	9506	3276	9557
2772	9508	3601/3602	9532
2780	9509	3631/3632	9560
3115	9527	3704	9516
3125	9525	3705	9515
3135 (2)	9512	3776	9544
3135-3 (3)	9512	3777	9528
3138 (4)	9550	3780	9521
3271	9513	3791	9535
3274	9558	4331	9571
Non-IBM	9520	5010	9531
RPQ Machines	9524	8101	9569
		8130	9567
		8140	9568

#7952 -- for attachment to common carrier Data Coupler type CBS. Calls must be established manually and may be answered either manually or automatically.

Note: To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the using system/terminal.

This feature can be used with BTAM programs for DOS, DOS/VS, OS, OS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required, in existing BTAM programming, to fully utilize the capabilities of the Switched Network Back-up feature. Conditioning of the telecommunication local loop for transmission of data faster than 300 bps is required. **Maximum:** One. **Field Installation:** Yes. **Specify:** Telecommunication cord #9031 for #7951 ... Telecommunication cord #9032 for #7952. **Prerequisite:** Point-to-Point (#6101), Multipoint Tributary (#5101), or Control Station Equalizer (#1601).

- (2) See "Limitations" in M 3135 pages.
- (3) See "Limitations" in M 3135-3 pages.
- (4) See "Limitations" in M 3138 pages.

Prices:	Mdl	MAC/MRC	Purchase	MMMC
3875	1	\$ 269	\$7,275	\$76.00

Rental Plan: B Purchase Option: 50% Maintenance: B
Warranty: B Useful Life Category: 2 Per Call: 2

SPECIAL FEATURES

The basic 3875 Modem (#9101) is used as the control station in a centralized multipoint network. **Specify:** #9101 and telecommunication line cord #9750.

Additional capabilities/configurations are provided by the following features.

ALTERNATE VOICE (#1051). Provides signalling capability, and a jack on the operator panel into which the customer provided handset may be plugged, permitting voice communication with the other end. Data cannot be simultaneously transmitted with voice. A handset is not provided. See 3875 User's Guide for description of handset. **Maximum:** One. **Field Installation:** Yes.

CONTROL STATION EQUALIZER (#1601). Provides the capability for a multipoint control station to operate with the Switched Network Back-up (#7951, 7952) features. **Maximum:** One. **Limitation:** Cannot be installed with Multipoint Tributary (#5101) or Point-to-Point (#6101). **Field Installation:** Yes. **Prerequisite:** Control Station Specify #9101.

FAN OUT (#3901). Permits attachment, to one 3875, of up to three business machines at one location. Only one of the machines may transmit at a time. The feature may be used at a tributary station or on a multipoint configuration, in which case the BSC multipoint line control procedure will handle the selection/operation without any additional user involvement. The feature may also be used to share the modem between two or three multiplexers at a central site for back-up purposes. In this case, though both multiplexers may receive the incoming data, the user switchover procedures must ensure that both multiplexers are not transmitting simultaneously. **Maximum:** One. **Field Installation:** Yes.

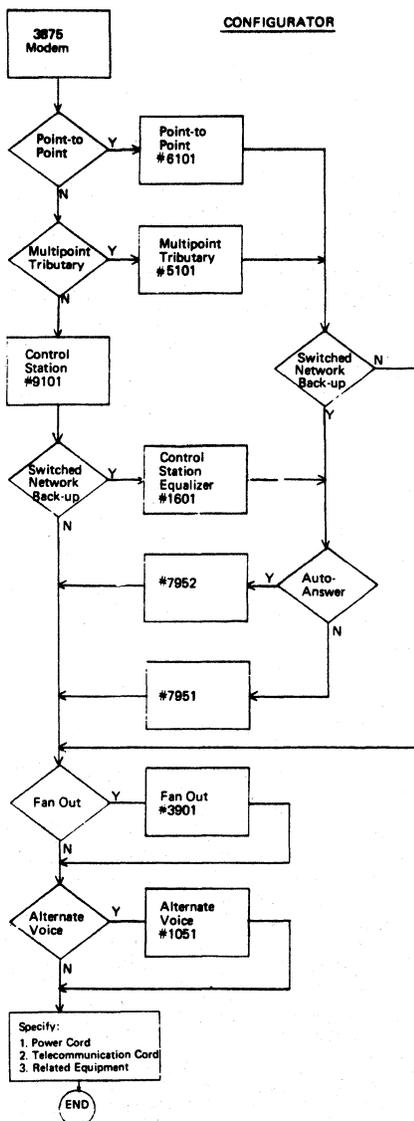
MULTIPOINT TRIBUTARY (#5101). Used on each modem at tributary stations in a centralized multipoint network to compensate for channel distortion between the control modem and tributary modem. Not required on the modem at the control station. Equalizer adjustments are on the operator panel. **Maximum:** One. **Limitation:** Cannot be installed with Point-to-Point (#6101) or Control Station Specify #9101 or Control Station Equalizer (#1601). **Field Installation:** Yes. **Specify:** Telecommunication cord #9750.

POINT-TO-POINT (#6101). Used on modems at each end of a point-to-point private line (non-switched) channel to compensate for the channel distortion. Equalizer adjustments are on the operator panel. **Maximum:** One. **Limitations:** Cannot be installed with Multipoint Tributary (#5101) or Control Station Specify #9101 or Control Station Equalizer (#1601). **Field Installation:** Yes. **Specify:** Telecommunication cord #9750.

SWITCHED NETWORK BACK-UP (#7951, 7952). Provides the capability of attaching the 3875 to a switched telecommunication network as a back-up to the private line (non-switched) channel. Operation is at 3600 bps with half-speed capability. A fixed compromise equalizer is provided for the back-up operation. A front panel switch permits operator selection of either facility or speed. Both facilities cannot be used simultaneously.

#7951 -- for attachment to the common carrier Data Access Arrangement type CDT. Calls must be established and answered manually.

Special Feature Prices:	MAC/MRC	Purchase	MMMC
Alternate Voice	#1051 \$ 16	\$ 455	\$.50
Control Station Equalizer	1601 28	758	7.00
Fan Out	3901 28	758	3.50
Multipoint Tributary	5101 84	2,270	15.00
Point-to-Point	6101 28	758	7.00
Switched Network Back-up			
DAA type CDT	7951 67	1,820	4.50
DC type CBS	7952 67	1,820	4.50





IBM 3880 STORAGE CONTROL

Purpose: Control unit for 3340/3344, 3333/3330, 3350 and 3370 direct access storage.

The 3880 provides two independent control unit paths, called Storage Directors. Each Storage Director provides for attachment of either up to four 3340 mdl A2s, or up to four 3370 mdl A1s, or up to four 3333s (any model) and 3350 mdl A2s/A2Fs in any combination ... see DASD Attachment Configuration under "Specify" below and 3330, 3333, 3340, 3344, 3350 and 3370 in "Machines."

Highlights: File organization and format are under program control, allowing random or sequential processing of files. Multiple requesting allows multiple overlapped operations on drives attached to each Storage Director. Data integrity is provided through extensive error detection and correction capabilities. Advanced logic and improved fault detection capability provide high availability.

Systems Attachments: The following DASD and Processor attachments are supported:

Processor(s)	DASD
4341	3330, 3333, 3340 3344, 3350, 3370

S/370	
Mdls 145, 145-3, 148, 155-II, 158, 158-3, 165-II, 168, 168-3	3330, 3333, 3340, 3344, 3350
3031, 3032, 3033	3330, 3333, 3340, 3344, 3350

Prerequisites: An available control unit position on a block multiplexer channel for each Storage Director. One unshared subchannel is required for each logical address attached to a block multiplexer channel. On a 4341 Processor, Storage Directors attaching 3350 or 3370 DASD must be attached to a 2.0 megabyte block multiplexer channel ... Storage Directors attaching 3330/3333 or 3340/3344 DASD may be attached to either a 1.0 or a 2.0 megabyte block multiplexer channel. On a S/370 mdl 165-II or 168, attachment is to the 2880 Block Multiplexer Channel.

Maximum: For configurations attaching 3340/3344 DASD, the Storage Director uses 64 contiguous addresses irrespective of the number of drives attached. The 3340 model A2s on the first and third strings may attach up to three 3340 model B1s/B2s and/or 3344s in any combination. The 3340 model A2 on the second string may attach up to three 3340 model B1s/B2s. The 3340 model A2 on the fourth string may attach one 3340 model B1 or B2 if any 3344 is attached to the first and/or third strings; it may attach three 3340 model B1s/B2s if there are no 3344s in the first or third strings.

For a Storage Director attaching 3370 DASD, a maximum of four 3370 model A1s, each with up to three 3370 model B1s may be attached.

For a Storage Director attaching 3330/3333/3350 DASD, a maximum of four 3333 mdl 1s, 3333 model 11s, and/or 3350 model A2s/A2Fs in any combinations may be attached. Each string with a 3333 model 1 or 11 may attach up to three 3330 model 1s/2s or 11s. Each string with a 3350 model A2/A2F may attach up to three 3350 model B2s/B2Fs or up to two 3350 model B2s/B2Fs and a 3350 model C2/C2F.

Limitations

- See 3330, 3333, 3340, 3344, 3370 for system support limitations.
- 3350 DASD attached to the 3880 must be in Native Mode format; 3330 models 1 and 11 Compatibility Mode are not supported.

Bibliography: GA26-1661

SPECIFY

- Voltage** (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9915 for 240 V. Note: 240 VAC is compatible with 230 VAC systems.
- DASD Attachment Configuration:** Two of the following must be specified; one for each Storage Director. The same specify feature may be specified twice. #9190 for 3340/3344, #9191 for 3370, or #9192 for 3330/3333/3350.
- Color:** #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

[reverse side is blank]

Prices:	Mdl	MRC	MLC 2 Yr	Purchase	MMMC/ AMMCR
	3880 1	\$1,704	\$1,450	\$62,350	\$160

Plan Offering: Plan D Machine Group: B Per Call: 3
 Purchase Option: 60% Warranty: B Useful Life Category: 2
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Initial Period of Maintenance Svc: 3 mos. Upper Limit Percent: 5%

* Diskette-only specify feature. No fee when ordered at time of manufacture. \$290 on purchased machines when attachment specify features are changed via MES.

SPECIAL FEATURES

REMOTE SWITCH ATTACHMENT (#6148). To attach the Two Channel Switch - Pair (#8170) to a configuration control panel. **Maximum: One. Field Installation: Yes.**

REMOTE SWITCH ATTACHMENT, ADDITIONAL (#6149). To attach the Two Channel Switch - Pair, Additional (#8171) to a configuration control panel. **Maximum: One. Field Installation: Yes.**

TWO CHANNEL SWITCH - PAIR (#8170). To attach each Storage Director to a second channel. Four unique channels may be switched, two to each Storage Director or the same two channels may be switched to both Storage Directors. The channels to be switched may be on the same or different processors. An available control unit position is required on each channel ... see "Prerequisites" above. Switching is under program control. Each Storage Director can be dedicated to a single channel by means of an enable/disable switch. **Maximum: One. Field Installation: Yes.**

TWO CHANNEL SWITCH - PAIR, ADDITIONAL (#8171). Adds switching for two additional channels per Storage Director on a 3880 equipped with a Two Channel Switch - Pair (#8170), providing four channel switch capability for both Storage Directors. Up to eight unique channels may be switched, four to each Storage Director. Each Storage Director can be dedicated to a subset of the four attached channels by means of an enable/disable switch. **Maximum: One. Field Installation: Yes. Prerequisite:** Two Channel Switch - Pair (#8170). **Limitation:** When #8171 is installed, 3340/3344s and 3370s may not be attached.

Special Feature Prices:		MRC	MLC 2 Yr	Purchase	MMMC/ AMMCR
Remote Switch Attachment #6148	NC	NC	NC	NC	NC
Remote Switch Attach, Add'l 6149	NC	NC	NC	NC	NC
Two Chnl Switch - Pr 8170	\$176	\$150	\$6,450	\$10	
Two Chnl Swtch - Pr, Add'l 8171	470	400	17,200	35	

**3881 OPTICAL MARK READER**

Purpose: Reads machine printed and/or handmarked data online into S/370 mdls 115, 125, 135, 135-3, 138, 145, 145-3, 148, 155 II and 158, or a 3031, 3032, 4331 or 4341 Processor, or offline to either of two magnetic media: diskette or compatible 9-track magnetic tape via a 3410 Magnetic Tape Unit mdl 1.

For possible use with System/3, see GSD manual.

Model 1 For use with a S/370 mdl 115, 125, 135, 135-3, 138, 145, 145-3, 148, 155 II or 158, a 3031, 3032, 4331, or 4341 Processor.

Model 2 Magnetic tape output via a 3410 Magnetic Tape Unit mdl 1.

Model 3 Output data written on IBM Diskette.

Highlights: The 3881 is a high speed optical mark reader. Data sheets are fed from a hopper with a 600-sheet capacity, through the reading area and directed to one of two output stackers. The main stacker has a capacity of 600 sheets. Sheets with detected errors are directed to a separate stacker with a 100-sheet capacity. Documents are stacked in the same sequence as they were entered in the hopper.

Data to be read can be placed on data sheets with ordinary #2 pencils, or by a 3203, a 1403 Printer, a 1443 Printer mdl 1 or 2 with a 52 or 63 character type bar with arrangement A, H or K, a 1443 mdl N1 or 2203 Printer mdl A1 with 52 or 63 character type bar, a 3211 Printer, or a 5203 Printer. The 1403/5203 print chains or trains, the 1443/2203 type bar, or the 3216 Interchangeable Train Cartridge must be equipped with an enlarged dash which replaces the standard dash ... see "Type Catalog."

Data Sheets: 3" x 3" to 9" x 12" ... up to 2,480 mark positions printed on a side. Preprinted mark positions are printed in rows of 40 positions on .2" centers for printer compatibility. Vertical spacing is up to 6 to the inch for printer compatibility. Rows and columns can be grouped into various combinations to form fields for the recording of source data.

Format Control Sheet: Used to load format control information into the 3881. Format control will define:

- The area of the input data sheet which is to be read.
- The marks allowed or discrimination required within each area.
- The sequence of the marking positions which make up the marking matrices.
- The output desired (numeric, alpha, alphanumeric or multiple mark format).
- The timing mark count which is expected on the sheets to be processed.
- BCD Read (optional feature) requirements.

From one to six formats, each consisting of one or more Format Control Sheets, are read by the 3881 at the beginning of a job. After reading the last Format Control Sheet, the data sheets of the job to be processed are loaded in the 3881.

S/370 or 4300 Processors: Documents are read under computer program control with speeds varying up to 6,000 documents/hour and 4,000 -- 8-1/2" pages/hour. Data is transferred to the CPU one page at a time on a fully buffered interrupt basis.

3410 Magnetic Tape Unit: Documents are read under control of the 3881 at speeds varying up to 5,400 documents/hour and 3,700 -- 8-1/2" x 11" pages/hour. The 3881 reads and fully buffers a document after which the data from the document is written as one record on tape. An optical feature, Dual Density, permits output at either 1600 bpi PE or 800 bpi NRZI.

Diskette: Documents are read under control of the 3881 at speeds varying up to 5,700 documents/hour (3" by 3") -- and 3,800 pages/hour (8-1/2" x 11").

The diskette drive and its control function are installed within the 3881 mdl 3. Each magnetic diskette has a storage capacity of up to 1,898 data records (128 characters each) with as many as 19 data sets per diskette. The contents of each document read by the 3881 is written within one data record (a maximum of up to 128 characters). The diskette media written by the 3881 is compatible with such devices as the 3741, 3742, 3747 and the 3540.

PREREQUISITES:

Model 1 -- For S/370 mdls 115 and 125, an available control unit position on the Multiplexer Channel (#5248) ... see 3115 and 3125. For S/370 mdls 135, 135-3, 138, 145, 145-3, 148, 155 II, 158, or a 3031 or 3032 Processor, an available position on a byte multiplexer channel ... see 3135, 3135-3, 3138, 3145, 3145-3, 3148, 3155, 3158, 3031 or 3032. For a 4331 or 4341 Processor, an available position on a byte multiplexer channel ... see 4331 or 4341. One 3881 can be attached.

Model 2 -- A 3410 Magnetic Tape Unit mdl 1 equipped with either Single Density (#3211) or Dual Density (#3221) ... see 3410.

Model 3 -- None.

Supplies: For printing marks, use IBM ribbon 1136940 or 1136430 on the 1403 (all models) and 1136430 on the 3203; 422536 on the 1443/2203; 1136964 on the 3211; 1136990 on the 5203, or equivalent ribbons capable of producing acceptable marks. For non-readable background printing, use ribbon 419101, or equivalent. Additional diskettes can be ordered

Format Control Sheets: 100 are provided with each 3881 ... additional pads of 50 may be ordered (GX21-9168).

Manuals: 3881 Reference Manual, GA21-9143 ... 3881 Systems Design Guide, GC20-1751.

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system or 3410 voltage. **FIELD INSTALLATION:** Yes.

[2] Invalid Marking Condition Code: #9301 for Hex 3F (unprintable), or #9302 for Hex 7C (printable). **FIELD INSTALLATION:** Yes.

[3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white. **FIELD INSTALLATION:** Yes.

[4] S/370 Adapter: #9551. Required when a 3881 mdl 1 is to be attached to a S/370 or a 4331 or 4341 Processor. **FIELD INSTALLATION:** Yes.

[5] System/3 Adapter: #9552. For details, see GSD manual.

[6] Kickstrips: #9431 ... if desired.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
3881	1	\$1,504	\$1,280	\$51,390	\$138
	2	1,369	1,165	46,800	109
	3	1,657	1,410	59,940	131

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Purchase Option: 50% Maintenance: A

Metering: Mdl 1 - I/O Unit (Online) Per Call: 2

Mdl 2 - Meter on 3410 Useful Life Category: 2

Mdl 3 - Meter on 3881 Warranty: B

Model/Feature Additional Charge in lieu of AU Charge: 10%

Termination Charge Months: 5 Termination Charge Percent: 25%

Upper Limit Percent: 0%

Model Changes: Field installable ... must be serial number 20001 or above for field upgrade to Model 3.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

Model 2 to Model 1	\$ 4,590
Model 2 to Model 3	13,140
Model 1 to Model 3	8,550

SPECIAL FEATURES

BCD READ (#1471). Provides, in addition to the basic read head, a second 12-position read head which allows the reading of high-density, preprinted binary coding. These heads will read as marks, digit "ones", the character "I" or a vertical bar (special character). Each BCD (Binary Coded Decimal) character read will be translated into its equivalent numeric EBCDIC code and transmitted to the CPU, the magnetic tape unit, or diskette one byte per character. Five of the twelve positions may contain BCD information which is weighted 1-2-4-8 parity with the reference (aligned) edge. The first row of BCD data following the start BCD Field Mark must indicate which 5 of the 12 positions will contain BCD data for that field. If an invalid BCD character is read or an even parity error is detected, an invalid marking condition code is sent to the CPU, diskette, or magnetic tape unit. **Field Installation:** Yes.

DOCUMENT COUNTERS (#3450). Provides two 5-position counters to be incremented by one of the documents processed by the 3881. Counters can be manually reset to zero. Counter 1 increments by 1 for each accepted document ... Counter 2 increments by 1 for each selected document. **Field Installation:** Yes.

DUAL DENSITY (#3550). [Model 2 only] Permits the 3881 to write on the 3410 Magnetic Tape Unit in either 800 bpi NRZI or 1600 bpi Phase Encoded modes. **Field Installation:** Yes. **Prerequisite:** Dual Density (#3221) on the 3410 Magnetic Tape Unit mdl 1.



3881 Optical Mark Reader (cont'd)

EXPANDED STORAGE (#3801). Provides for an additional 512 bytes of memory which may be required in those situations where the number of formats, fields and characters processed exceed the maximum number of positions available within the basic data store. **Maximum: One. Field Installation: Yes.** The formula for the determination of this condition is as follows:

$$5(F + n) + \text{BCD Bytes} + \text{Normal Bytes} + S + I - E$$

E = 435 for 3881 mdls 1 and 2, or 307 for 3881 mdl 3.

Where: F = Number of instruction fields used on all Format Control Sheets loaded.

n = Number of different formats used with the alternate format capability (from 1 to 6).

S = 7 if Serial Numbering (#6451) is installed and is being used -- otherwise, S = 0.

I = Total number of bytes required to store image format data.

SERIAL NUMBERING (#6451). A device for printing consecutive serial numbers on the form being processed. Will print 7-digit number (2-digit batch and 5-digit serial number) which can be manually set to zero or any desired setting. A reading of the counter may be obtained and entered into the 3881 logic via a marked Serial Number Card. Various options exist for the printing of the number. A control switch provides either selective serial numbering based on stacker selection, or a 7-digit batch number without unit advancing. Concurrent with printing, the number will be transmitted to the CPU or the output tape unit or the diskette.

Supplies: Ribbon -- uses IBM purple ribbon, 1136844 or equivalent. Serial Number Card -- packets of 100

may be ordered (SX21-9169). **Field Installation: Yes.**

Special Feature Prices:	MAC/ MRC	ETP/ MLC		Purchase MMMC	
		2 yr			
BCD Read	#1471	\$ 61	\$ 52	\$2,150	\$ 1.50
Document Counters	3450	22	19	853	2.00
Dual Density	3550	156	133	5,410	.50
Expanded Storage	3801	61	52	2,150	.50
Serial Numbering	6451	183	156	6,325	25.00

Document Inspection Gauge -- one is furnished with each 3881 as a Customer Engineering tool. Used for checking printing alignment on data sheets. Additional gauges, P/N 2450145, are \$35 each

3886 OPTICAL CHARACTER READER

Purpose: Optically reads OCR-A font and OCR-B font machine printed numeric digits, alphabetic characters, and handprinted numeric digits from a wide variety of forms. Attaches online to any virtual storage S/370 Processor, or any 4300 Processor, or offline to the 3410 Magnetic Tape Unit mdl 1 which provides compatible 9-track magnetic tape.

Model 1 For use with any virtual storage S/370 Processor, or any 4300 Processor.

Model 2 For use offline with a 3410 Magnetic Tape Unit mdl 1.

Model Changes: Field Installable.

Highlights: The 3886 is a general purpose optical character recognition reader designed to meet a broad range of data entry requirements. It will read multiple lines of print from forms ranging in size from 3 to 9 inches wide (direction of printing) and from 3 to 12 inches long. Allowable weights range from 16# to card stock ... see "Documents and Printing."

Forms enter the 3886 from the input hopper which has a capacity of one inch of forms. The forms are advanced line by line (maximum 3 lines per inch) past a read station which incorporates a total solid state scanning system to collect character images. These images are analyzed by recognition programs within the 3886 recognition and control processor. After a complete line has been recognized, certain user specified editing and output formatting functions take place. The line output is then transmitted to the S/370, any 4300 Processor, or to a 3410 Magnetic Tape Unit mdl 1.

After the complete form has been read it is directed to one of two output stackers, each having a capacity of one inch of forms.

The recognition, machine control, and FE diagnostic microprograms for the 3886 are supplied on an internal direct access storage device. The use of these programs singly or in combination is dependent on the configuration of the 3886 ... see "Configurator."

Input from several different sources can be read on the 3886. The "Table of Acceptable Characters and Printing Devices" below shows the characters which are acceptable from typewriters, high speed printers, lithograph, or, in the case of Numeric Handwriting, a pencil.

Model 1 -- the online 3886 mdl 1 provides buffered time-independent attachment to S/370 mdl 115 and 125 via an optional multiplexer channel, or to S/370 mdl 135, 135-3, 138, 145, 145-3, 148, 155 II, 158, 165 II, and 168 via byte multiplexer, block multiplexer or selector channels, or to a 3031, 3032, 3033, 4331 or 4341 Processor via byte multiplexer or block multiplexer channels. Forms are read and other 3886 functions are performed under S/370 or 4300 Processor program control. The basic 3886 mdl 1 contains 24K bytes of Instruction Storage for machine control and recognition microprogram storage.

Model 2 -- the offline 3886 mdl 2 operates independently of any Processor. It produces compatible 9-track magnetic tape output via the attachment of a 3410 Magnetic Tape Unit mdl 1. The user indicates form characteristics and processing requirements with Line/Field and Job Specification Sheets. These are translated on a special 3886 run into the necessary Format Control information, and then stored on the internal DASD for subsequent use.

Up to eight different form layouts (all one size) can be intermixed within a batch (run). Certain editing and validation functions normally performed by the host Processor are also provided. These include self-check digit (Modulus 10) calculation, column or cross-foot total verification, and field to field comparison. The results of these functions can be specified to control stacker selection, Serial Numbering and Line Marking features if they are installed ... see "Special Features." The basic 3886 mdl 2 contains 32K bytes of Instruction Storage for machine control and recognition microprogram storage.

Speed -- document throughput depends upon 3886 model, document length, number and type of characters read, the amount of output editing and formatting specified, and the user S/370 or 4300 Processor program (model 1).

On the model 1 speeds range from approximately 5,800 three-inch long single line 8 character machine printed turnaround documents per hour, to approximately 330 typewritten 8-1/2" x 11" pages with 2,262 characters (29 lines of 78 characters).

On the model 2, speeds for the same forms range from approximately 5,200 documents to approximately 300 pages per hour. SRL GA21-9148 contains formulas which should be used to determine throughput for specific forms.

Documents and Printing -- the input forms and printing to be read by the 3886 must conform to the established specifications described in SRL GA21-9148. Only those ribbons (see "Supplies") and background inks specifically meeting the outlined spectral criteria will give satisfactory performance. Certain restrictions apply

to document sizes, weights, and combinations thereof. These are discussed in SRL GA21-9148.

Supplies -- providing maximum flexibility in background ink colors and intensities requires that ribbons used for printing 3886 input are carefully selected. The following, or their equivalents, should be used: For Film Ribbon Selectric 1136310 or 1136391 ... for Fabric Ribbon Selectric 1136138 ... for 1403 (all models) 1136430 ... for 3211 ribbon 1136627 for 20-24 lb. Bond and 1136626 for all heavier papers ... for 3203 (all mdl's) 1136430 ... for 5211 mdl 2 1299243. Ribbons not having similar characteristics may result in reduced recognition performance and/or reduced ribbon life.

PREREQUISITES:

Model 1 -- an available control unit position on the Multiplexer Channel (#5248) of a S/370 mdl 115 or 125, or a byte multiplexer, block multiplexer or selector channel of a S/370 mdl 135, 135-3, 138, 145, 145-3, 148, 155 II, 158, 165 II, 168, or a byte multiplexer or block multiplexer channel on a 3031, 3032, 3033, 4331 or 4341.

Model 2 -- a 3410 Magnetic Tape Unit mdl 1 ... if Single Density (#3211) is on the 3410, a Single Density, Tape Adapter (#6490) is required on the 3886 ... if Dual Density (#3221) is on the 3410, a Dual Density, Tape Adapter (#6485) is required on the 3886. See "Special Features."

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage. **FIELD INSTALLATION:** Yes.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Upending Kit: #9840, if required ... loan basis on initial machine order only, remains property of IBM. Dimensions will be 29-1/2" wide, 60" long and 76" high.

[4] 3211/5211 Compatibility: #9701, if required ... only if predominantly reading 3211 or 5211 generated documents.

PRICES:	Mdl	MAC/	ETP/	Purchase	MMMC
		MRC	2 yr		
3886	1	\$2,591	\$2,205	\$83,520	\$523
	2	2,791	2,375	89,910	523

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Purchase Option: 40% Maintenance: B

Warranty: B Useful Life Category: 2 Per Call: 2

Metering: Mdl 1 -- I/O Unit (Online)

Mdl 2 -- I/O Unit (Offline)

Model/Feature Additional Charge in lieu of AU Charge: 10%

Termination Charge Months: 5 Termination Charge Percent: 25%

Upper Limit Percent: 0%

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 1 to Model 2 \$6,390

SPECIAL FEATURES

DATA STORAGE, ADDITIONAL (#3210). OCR-B Font and Numeric handprinting recognition require this feature to handle the more complex character shapes which appear in these fonts. **Maximum:** One. **Field Installation:** Yes.

HOPPER AND STACKER CAPACITY, ADDITIONAL (#4520). The standard hopper and two stackers on the 3886 each have a capacity of one inch of forms. This feature adds the motors, sensors, etc., to increase that capacity to approximately 4 inches in each. **Field Installation:** Yes.

INSTRUCTION STORAGE, ADDITIONAL (#4610). The recognition microprograms for alphameric machine printed fonts and Numeric Handprinting require storage capacity greater than the basic models of the 3886, as do combinations of fonts. This feature provides the necessary additional storage increments of 8K bytes. Up to nine of these features may be added ... see "Configurator." **Field Installation:** Yes.

LINE MARKING (#4720). Provides a four-position fixed slug printer (1, 2, 4 and 8) which prints 15 different codes to be used as an aid to error correction procedures. It is used to indicate field location or error type information in the margin of lines requiring corrective action. It will also provide page marking capability to indicate user controlled post-processing document handling information. Line marking is under program control on the mdl 1 and is controlled by coding on the specification sheets on mdl 2. **Ribbons:** Line marking may be done with a purple ribbon (414499) or equivalent if marked documents are to be re-processed through the 3886. Otherwise a black ribbon (414491) or equivalent may be used. **Field Installation:** Yes. **Prerequisite:** Numbering/Marking Adapter (#5340).

NUMBERING/MARKING ADAPTER (#5340). Provides a group of common parts necessary for the installation of Serial Numbering

3886 Optical Character Reader (cont'd)

(#6450) and/or Line Marking (#4720). **Maximum:** One. **Field Installation:** Yes.

NUMERIC HANDPRINTING (#5360). Provides the additional machine circuits to read the handprinted numbers 0-9 and the letter X. For optimum operation, character shapes and spacing should conform to the basic rules of handprinting as outlined in SRL GA21-9148. Handprinting should be performed with ordinary #2 pencils or grade HB fine line lead for mechanical pencils. The NHP feature includes the ability to read forms supplier preprinted Gothic 3/16" font numbers 0-9. The feature provides two modes of operation, normal and verify. The appropriate mode can be selected on a field-by-field basis depending on the critical nature of the data, the circumstances of form preparation, and the level of other available control techniques. **Field Installation:** Yes. **Prerequisites:** Data Storage, Add'l (#3210) and sufficient Instruction Storage, Add'l (#4610) ... see "Configurator."

SERIAL NUMBERING (#6450). Permits the sequential numbering of forms as they are processed. A ten-position numbering head is provided, of which five are unit advanced and five are stationary. Selection of documents to be printed works in conjunction with stacker selection. **Ribbons:** Serial Numbering may be done with a purple ribbon (1136844) or equivalent if numbered documents are to be re-processed through the 3886. Otherwise a black ribbon (1136843) or equivalent may be used. **Field Installation:** Yes. **Prerequisite:** Numbering/Marking Adapter (#5340).

TAPE ADAPTER, DUAL DENSITY (#6485). [Model 2 only] Provides the appropriate adapter, within the 3886, to attach a 3410 Magnetic Tape Unit mdl 1 for writing at 1600 bpi PE or 800 bpi NRZI (Feature #3221 on 3410). **Field Installation:** Yes.

TAPE ADAPTER, SINGLE DENSITY (#6490). [Model 2 only] Provides the appropriate adapter, within the 3886, to attach a 3410 Magnetic Tape Unit mdl 1 for writing at 1600 bpi PE (Feature #3211 on the 3410). **Field Installation:** Yes.

VIDEO COLLECT FEATURES (#8701, 8702, 8703). **Prerequisites:** Each of the following Video Collect Features requires Additional Data Storage (#3210) plus two increments of Additional Instruction Storage (#4610), in addition to the increments required to hold the font recognition programs as described in Figure 10 of the 3886 SRLs (GA21-9147 and GA21-9154) and the Configurator below. **Limitations:** The required 3277 mdl 1 or 2 (as described below) cannot be equipped with any of the following: Operator Identification Card Reader (#4600), Selector Light Pen (#6350), ASCII Character Set (#9091 or #9092), or ASCII Keyboard (#4634 or #4635). For #8703, if a 3277 mdl 1, with the RPQ listed below, is to be attached to the required 3272 Control Unit mdl 2, at least one 3277 mdl 2 (with or without the RPQ) must also be attached to the same 3272 Control Unit for diagnostic purposes.

VIDEO COLLECT (#8701). [Model 2 only] Provides for direct attachment of a 3277 Display Station mdl 1 with RPQ to a 3886 mdl 2. (No 3272 Control Unit is required.) Entries on Line and Field Specification Sheets allow the 3886 to collect video image data of reject characters in specified fields and/or the collection of the video image of an entire field at either 0.006" or 0.012" resolution. Video image data will be displayed on the cable attached 3277 (with RPQ) for visual recognition. The display operator will key enter the correct data. The data record will be updated with the keyed information before being written to tape. **Field Installation:** Yes. **Prerequisites and Limitations:** See above.

VIDEO COLLECT (#8702). [Model 2 only] Entries on Line and Field Specification Sheets cause collection of video image data of reject characters in specified fields and/or the collection of the video image of an entire field at either 0.006" or 0.012" resolution. Video image data is written to tape in record lengths that match the user selected data record length. The tape can be processed on a system and have the video image displayed on a 3277 Display Station mdl 1 or 2 equipped with RPQ 8K0438 and attached to the CPU via a 3272 Control Unit mdl 2. **Field Installation:** Yes. **Prerequisites and Limitations:** See above.

VIDEO COLLECT (#8703). [Model 1 only] Provides the ability to collect video image data of reject characters in specified fields and/or the collection of the video image of an entire field at either 0.006" or 0.012" resolution. The video image data can be transferred from the 3886 to the CPU by user written routines coded with present 3886 Type I programming support. The display of video image data will require a 3277 Display Station mdl 1 or 2 equipped with RPQ and attached to the CPU via a 3272 Control Unit mdl 2. **Field Installation:** Yes. **Prerequisites and Limitations:** See above.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Data Storage, Add'l	#3210 \$ 25	\$ 21	\$ 844	\$.50
Hppr & Stkr Cp'ty, Add'l	4520 209	178	6,785	27.50
Instruction Storage, Add'l	4610 132	112	4,220	11.50
Line Marking	4720 143	122	4,680	11.50
Numbering/Marking Adptr	5340 36	31	1,280	.50
Numeric Handprinting	5360 170	145	5,510	31.50
Serial Numbering	6450 209	178	6,785	27.50
Tape Adptr, Dual Density	6485 36	31	1,280	.50
Tape Adptr, Single Density	6490 19	16	633	.50
Video Collect -- mdl 2	8701 121	103	4,140	2.50
Video Collect -- mdl 2	8702 NC	NC	NC	NC
Video Collect -- mdl 1	8703 NC	NC	NC	NC

CONFIGURATOR

All 3886 Optical Character Readers will be shipped containing an internal DASD. That device will contain all of the recognition microprograms for OCR-A font, OCR-B font and NHP. (See "Table of Acceptable Characters." This configurator shows which features are necessary in order to utilize all valid combinations of those recognition programs.

From the following table, find the combination of fonts which will appear within any one batch (run) of input forms. The features shown on that line are required. If any other batch (run) will contain another font, a greater quantity of #4610 may be required to cover the maximum combination of fonts for all batches to be run in various applications.

						Quantity of Features Which Must be Ordered		
Numeric OCR-A	Numeric OCR-B	Alphameric OCR-A	Alphameric OCR-B	Numeric Handprinting	Instruction Storage, Add'l* (#4610)	Numeric Handprinting (#5360)	Data Storage, Add'l (#3210)	

Single Machine Font Configurations

X							1
	X						1
		X			1		
				X	3	1	1
X				X	4	1	1
	X			X	4	1	1
			X		4		1
		X		X	5	1	1
			X	X	8	1	1

Combination OCR-A and OCR-B Configurations

X	X				1		1
	X	X			2		1
X	X			X	5	1	1
X			X		5		1
		X	X		6		1
	X	X		X	6	1	1
X			X	X	9	1	1

* Equal or smaller size combinations of fonts will operate on machines with the required features (#5360 and #3210).

Example: User batch to be processed will contain Alphameric OCR-A font and Numeric Handprinting. This requires the following features: Quantity of 5 of #4610 plus 1 of #5360 and 1 of #3210.

Other batches this user will be able to run can include the following fonts or combinations of fonts:

- Numeric-A
- Numeric-B
- Numeric-A and NHP
- Numeric-B and NHP
- Alphameric-B
- Numeric-A and Numeric-B
- Numeric-B and Alphameric-A
- Numeric-A and Numeric-B and NHP
- Numeric-A and Alphameric-B

3886 Optical Character Reader (cont'd)

TABLES OF ACCEPTABLE CHARACTERS AND PRINTING DEVICES

OCR-A FONT, SIZE 1 (1)

5211 mdl 2 (see note 8)	1403 mdls 2, 3, 7, NI (or equivalent), 3203 - all mdls (or equivalent), IBM Selectric® Typewriter or equivalent, and IBM 3800 (7). Numeric Set only from 3211 (see note 6).	Additional Characters from IBM Selectric® Typewriter (or equivalent) Only.	
	Numeric	Alphameric	
0	0 .	A N &	{
1	1 *	B O	+
2	2 *	C P	}
3	3 -	D Q	;
4	4 /	E R	%
5	5 .	F S	?
6	6 blank	G T [Plus all	:
7		H U Characters	' (3)
8		I V to left	=
9		J W except Y]	"
<		K X	AB€ (Grp Erase)
>		L Y	■ □ (Char Erase)
+		M Z (2)	| (4)
	(6)	(5)	

- (1) The division of characters into sets above refers to 3886 recognition capability. The appropriate type catalog arrangements should be referenced for high speed printer output character sets.
- (2) These characters are recognized in mode 1 alphameric set. **
- (3) All these characters are recognized only on mode 2 alphameric set ** except Group Erase, ■ and □ which are recognized in the numeric set also.
- (4) The LVM (long vertical mark) is recognized in all OCR-A character sets. The LVL (preprinted long vertical line) is also recognized. **
- (5) The timing mark dash (—) can be substituted for a non OCR-A font graphic (#) for the purpose of printing timing marks. See "Type Catalog" for details.
- (6) The OCR Print Package (#5450), on the 3211 is a prerequisite for OCR applications. Use of the Reread On Reject capability and 20-24 lb. Bond is recommended for optimum performance. When other papers are used, customer testing should be performed to assure adequate reading performance.
- (7) Minimum paper weight for documents produced on the 3800 is 20 lb.
- (8) With the 5211, use of Reread on Reject and 20-24 lb. single part forms are required.

OCR-B FONT, SIZE 1 (1) (5)

5211 mdl 2 (see note 7)	1403 mdls 2, 3, 7, NI (or equivalent), 3203 - all mdls (or equivalent), 3211 (see Note 4), 3800 (6), and IBM Selectric® Typewriter (or equivalent).	Additional Characters from IBM Selectric® Typewriter (or equivalent) only. These can be recognized in all OCR-B Font Character Sets.	
	Numeric	Alphameric	
0	0 .	A N	| LVM) (2)
1	1 \$	B O	AB€ (Grp Erase)
2	2 *	C P	■ □ (Char Erase)
3	3 -	D Q	
4	4 /	E R	
5	5 .	F S [Plus all	
6	6 .	G T Characters	
7	7 .	H U to left]	
8	8	I V	
9	9	J W	
<	<	K X	
>	> (3)	L Y	
+	+	M Z	

- (1) The division of characters into sets above refers to 3886 recognition capability. The appropriate type catalog arrangements should be referenced for high speed printer output character sets.
- (2) The LVM (long vertical mark) is recognized in both numeric and alphameric OCR-B but can only be preprinted or typed. The LVL (long vertical line), a special case of the LVM, can also be recognized.**
- (3) The timing mark dash (—) can be substituted for the greater than (>) for the purpose of printing timing marks. See "Type Catalog" for details.
- (4) The OCR Print Package (#5450), on the 3211, is a prerequisite for OCR applications. Use of the Reread On Reject capability and 20-24 lb. Bond is recommended for optimum performance. When other papers are used, customer testing should be performed to assure adequate reading performance.
- (5) This is compatible with the European Computer Manufacturers Associate revised OCR-B Font published in the Standard ECMA-11

** See IBM 3886 OCR Model 1 Component Reference Manual GA21-9147 and IBM 3886 OCR Model 2 Component Reference Manual GA21-9154.

for Alphameric Character Set OCR-B for Optical Recognition, 2nd Edition, dated October, 1971.

- (6) Minimum paper weight for documents produced on the 3800 is 20 lb.
- (7) With the 5211, use of Reread on Reject and 20-24 lb. single part forms are required.

Numeric Handprinting: Recognizes the following: 1 2 3 4 5 6 7 8 9 0 X. Preprinted Gothic 3/16" font digits 0 1 2 3 4 5 6 7 8 9 can also be read. Blanks are not recognized in NHP. European Numeric Handprinting (ENHP) can be selected by proper codes in the Format Control Record.** This provides recognition of the 1 (one) and 7 (seven) commonly used in several European countries in place of the NHP 1 and 7.

Document Inspection Gauge P/N 2448299: One is furnished with each 3886 as a customer engineering tool. It is used for checking printing alignment on data sheets. Additional gauges are \$35 each.

[reverse side is blank]

IBM 3890 DOCUMENT PROCESSOR

Purpose: Reads magnetically inscribed data from card and paper documents into any virtual storage S/370 Processor except 3115 or 3125 via the byte multiplexer or block multiplexer channel, or a 4331 or 4341 Processor via a byte multiplexer or block multiplexer channel. Can be used offline for document sorting.

Models: The 3890 is available in twelve models;

Model A1 -- six stackers	
Model A2 -- twelve stackers	
Model A3 -- eighteen stackers	13,312 bytes of storage (10,240 bytes if image processing) for stacker select program and initialization data.
Model A4 -- twenty-four stackers	
Model A5 -- thirty stackers	
Model A6 -- thirty-six stackers	
Model B1 -- six stackers	
Model B2 -- twelve stackers	
Model B3 -- eighteen stackers	29,696 bytes of storage (26,624 bytes if image processing) for stacker select program and initialization data.
Model B4 -- twenty-four stackers	
Model B5 -- thirty stackers	
Model B6 -- thirty-six stackers	

Highlights: The 3890 is a buffered modular pocket reader sorter which is time independent. Documents are read at a minimum rate of 2400 six-inch documents per minute. Actual throughput depends upon length of document. The formula for determining approximate average rated throughput per minute is: The percentage of non-card stock checks x [19200/(average document length which is 6" or greater plus 2")] + the percentage of card stock checks x (1907). The primary component of the 3890 is the feed module which contains the input hopper, recognition circuits, logic to determine stacker selection, merge feed, options when installed and operator set-up and run panels.

Input Hopper -- holds approximately 4800 documents and permits convenient, continuous loading. A jogger is built into the hopper to eliminate jogging as a separate operation.

Merge Feed -- permits the merging of documents into the normal input stream from a separate hopper. Document capacity is 600. Document merging is controlled by the user program. For example, as part of job initialization, the user can specify the approximate number of documents to be stacked in each pocket before a document is fed from the hopper to that pocket. The 3890 will maintain a document count for each pocket. The merge function eliminates the need for programmed pocket lights. **Limitation:** Does not permit the 3890 to function as a collator.

Logic and Control Section -- is initialized by the CPU when online and by a removable disk when offline. Initialization determines the fields to be read, length of the fields, starting number for the item numbering feature, merge feed controls, if image processing is to be performed, the stacker control instruction algorithm to be used, endorser requirements, and whether the symbol error correction option is to be used. With the symbol error correction option, the 3890 performs extensive logical analysis to determine if unreadable symbols can be replaced by internally-generated field defining symbols. The 3890 performs all stacker select determinations independent of CPU control and transfers blocked data records to the CPU. Due to the logical capability, the following functions are standard "programmable" ... split field ... self-check number verification ... multiple column control ... base number conversion for fine sorting.

Stackers -- each pocket holds approximately 800 to 1000 documents. The operator can unload all but the last 200 - 300 documents without stopping the 3890. Pocket warning lights alert the operator when a specific pocket is becoming full. The reject stacker is the first stacker ... the stacker closest to the input hopper. Racks for output trays are above each stacker.

Documents -- E13B magnetic characters, print quality, and code-line arrangement on the documents must meet the specifications recommended by the American Bankers Association. Intermixed paper and card documents within the following specifications can be processed:

- Length -- 4.85 to 8.75 inches (123 to 223mm).
- Width -- 2.75 to 4.17 inches (70 to 106mm).
- Thickness -- .0025 to .007 inches (.064 to .178mm).
- Carrier documents containing mutilated documents with a total thickness up to .014 inches (.356mm) will also be transported.

Base Weights -- 16 to 44 lbs. (basic weight is the weight of 500 sheets of 17" x 22" paper), 60 to 165 grams per square meter.

Grain -- long grain or short grain, except for 16 lb. paper, which must be long grain.

Bibliography: Machine and Programming Description, GA24-3612.

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): **#9903** for 208 V, or **#9905** for 230 V ... must be consistent with system voltage.

[2] Color: **#9041** for red, **#9042** for yellow, **#9043** for blue, or **#9046** for white.

[3] Upending Kit: **#9840**, if required ... loan basis, remains the property of IBM.

[4] Cabling: **#9181** for on the floor, if required.

[5] SS2 Transmission Option: **#9666**. Codeline SS2's are not treated as field defining symbols. Requirement for this option is limited. Before specifying refer to IBM 3890 General Information Manual TNL (GN24-0647). **FIELD INSTALLATION:** Yes.

[6] Tool Kits: Required for CE maintenance. For Rental Customer -- specify on first 3890 order for a customer. If required for a multiple machine installation, an additional Tool Kit(s) is available. For Purchase Customers -- specify on each 3890 machine order. When installed rental 3890s are purchased, a Tool Kit is to be ordered on a no-charge for each machine. **Specify:** **#9766** for base machine ... **#9767** for Microfilming (#5111) ... **#9768** for Item Numbering/Endorsing (#4666).

PRICES	Mdl	Basic	BETP/	Monthly
		Monthly	MLC	Use Charge
		Charge/	2 yr	Rate (\$/meter hr.)
		MRC		
Rental 3890	A1	\$ 4,717	\$ 4,015	\$12.90
	A2	5,469	4,655	14.95
	A3	6,221	5,295	17.00
	A4	6,973	5,935	19.05
	A5	7,725	6,575	21.10
	A6	8,477	7,215	23.15
	B1	5,863	4,990	12.90
	B2	6,615	5,630	14.95
	B3	7,367	6,270	17.00
	B4	8,119	6,910	19.05
	B5	8,871	7,550	21.10
	B6	9,623	8,190	23.15
		Purchase	Basic	Add'l MMC
		Price	MMC	Rate (\$/meter hr.)
Purchase 3890	A1	\$256,800	\$ 186	\$12.90
	A2	299,800	222	14.95
	A3	342,800	258	17.00
	A4	385,800	294	19.05
	A5	428,800	330	21.10
	A6	471,800	366	23.15
	B1	300,800	226	12.90
	B2	343,800	262	14.95
	B3	386,800	298	17.00
	B4	429,800	334	19.05
	B5	472,800	370	21.10
	B6	515,800	406	23.15

Plan Offering: Plan C (Monthly Use Plan)
 Maintenance: Available 24 hrs. per day, 7 days per week.
 Metering: I/O Unit (On-line/Off-line) Per Call: 3
 Purchase Option: 50% (not applicable to Monthly Use Charge)
 Warranty: B Useful Life Category: 2
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%



DP Machines

M 3890.2
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3890 Document Processor (cont'd)

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To	A2	A3	A4	A5	A6
A1	\$43,000	\$86,000	\$129,000	\$172,000	\$215,000
A2		43,000	86,000	129,000	172,000
A3			43,000	86,000	129,000
A4				43,000	86,000
A5					43,000

From To	B1	B2	B3	B4	B5	B6
A1	\$45,950	\$88,950	\$131,950	\$174,950	\$217,950	\$260,950
A2		45,950	88,950	131,950	174,950	217,950
A3			45,950	88,950	131,950	174,950
A4				45,950	88,950	131,950
A5					45,950	88,950
A6						45,950

From To	B2	B3	B4	B5	B6
B1	\$43,000	\$86,000	\$129,000	\$172,000	\$215,000
B2		43,000	86,000	129,000	172,000
B3			43,000	86,000	129,000
B4				43,000	86,000
B5					43,000

SPECIAL FEATURES

ITEM NUMBERING/ENDORING (#4666). Provides the capability of printing an 8-digit number and/or a full endorsement on the back of each document. The starting item number and 1 of 3 print locations is determined by the user program at initialization. The number can be incremented on any document cycle based on the user-provided stacker control instruction parameters for the run. The number can be configured by the user at installation to be a combination of batch and serial number or serial number only. Vertical location of the item number is specified by the customer and is normally set at the plant.

During run initialization, the user specifies whether endorsing is active and one of three horizontal print positions. Vertical location of endorsement is specified by the customer and is normally set at the plant. The design of the endorser facilitates operator changing of endorser legends for users who have a requirement to print different endorsements. The date portion of the endorser is set by the operator. **Specify: #9167** for endorsement at top, or **#9168** for center, **#9379** for number at bottom, or **#9378** for center.††† Color of endorser ink to be used -- **#9145** for black, **#9147** for purple, **#9148** for red, or **#9149** for blue. **Field Installation:** Yes.

MICROFILMING (#5111). Provides the capability of microfilming items, either front and back (duplex) or front only (duo), being processed on the IBM 3890. Items are selectively filmed under program control at 3890 document speeds. An eight-digit number can be exposed on the film for every other document image recorded on film. The eight number positions can be split into two number fields which can be incremented or reset on any document cycle under stacker control instruction parameters for the run. During run initialization, the user specifies whether microfilming is active, the mode of filming, and the starting eight-digit number. A frame mark is recorded on film for each document image for image counting during retrieval. The camera provides a reduction ratio of 50 to 1 and a resolution of 120 lines per millimeter. The film is advanced by a capstan drive system based upon the document width to maximize the use of film. The film cassette, a purchase only item (see M 10000 pages), provides space for take-up of the film as well as the film supply. Capacity of the cassette is 2,000 feet of .0027 polyester thin base film. Loading and unloading of film from the cassette into the film transport is automatic under operator control. Approximately 380,000 front and back images of an average intermix of documents can be recorded on 2,000 feet of film. The film is spaced six inches every 215 feet to facilitate splicing; if a 49 inch space is required, specify #9177. The film to be used is 16mm unperforated thin base microfilm which must be ordered on cores. Disclosure specifications covering the film, cassette, and core on which the film must be wound, are available from IBM Industry Relations/ Product Information, Dept.767, CHQ, Old Orchard Road, Armonk, N. Y. 10504. Film must be ordered on cores (Part No. 2648096 or equivalent) with an 1/8 inch diameter hole center punched approximately seven feet from each end of the film. **Field Installation:** Yes.

S/370 ATTACHMENT (#6370). Permits attachment to any virtual storage S/370 Processor or 4300 Processor via the byte multiplexer channel or the block multiplexer channel. This feature is required on each 3890 attached to a S/370 or any 4300 Processor. **Maximum: One. Field Installation:** Yes

Special Feature Prices

Rental	BMC/MRC	BETP/MLC 2 yr	Monthly Use Charge Rate (\$/meter hr.)
Item Numbering/Endors #4666	\$ 775	\$ 660	\$ 2.65
Microfilming 5111	2,303	1,960	6.60
S/370 Attachment 6370	108	92	—

Purchase	Purchase Price	BMMC	Monthly Use Charge Rate (\$/meter hr.)
Item Numbering/Endors #4666	\$ 46,290	\$172.00	\$ 2.65
Microfilming 5111	132,250	100.00	6.60
S/370 Attachment 6370	4,070	10.00	—

††† For the purpose of minimizing overprinting of item numbers and endorsements, 3890s ordered for Federal Reserve Banks should specify #9167 for endorsement at top and #9378 for item number at center. All other machines should specify #9168 for endorsement at center and #9379 for item number at bottom.

**3895 DOCUMENT READER/INSCRIBER**

Purpose: Magnetically reads the E13B codeline inscribed on card and paper documents, optically reads machine printed and intermixed unconstrained handprinted numeric amounts from checks and/or deposit tickets, inscribes the amounts in the MICR codeline, and sorts into multiple stackers under control of the attached S/370 model 125-2, 135, 138, 145, 148, 155 II, 158, 165 II or 168, or a 3031, 3032 or 3033 Processor, or 4331 or 4341 Processor.

Model 1 Six stackers

Model 2 Twelve stackers

Highlights: The 3895 is a multi-stacker document reading and inscribing device which is time independent. Documents are processed at a rated speed of 525 six-inch documents per minute. Actual thruput depends on a number of factors including document type, size, mix and quality; number of fields scanned and/or inscribed; number of characters printed; complexity of the software; CPU load and priority of processing. The transport system of the 3895 consists of the primary hopper, merge hopper, MICR I, bar code reader, OCR reader, printer/inscriber, MICR II, endorser, and stackers.

Input Hopper -- holds approximately 5-1/2 inches of documents in a gravity feed permitting non-stop feeding. The feeding and processing of documents are controlled by the host CPU application support program. The maximum size document which can be processed by the 3895 is 4-1/8 inches high and 9 inches long.

Merge Hopper -- permits pinpoint merging of documents into the transport path just prior to the OCR read station. All processing functions except MICR I read and bar code read can be performed on documents from the merge feed. Document capacity of the hopper is approximately 5-1/2 inches.

MICR I -- the preprinted and/or MICR codeline is read at this station using IBM's latest single gap reading technique. Data read at this station is stored in a buffer and shifts in the buffer as the document moves through the transport. This station also contains a bar code reader. Special type documents such as deposit documents may be recognized by a unique MICR field or a preprinted bar code. The functional unit which serves to type or identify these documents according to the pre-specified identification parameters is the Document Identification Handler. The document moves from the MICR I station to the pre-scan station and will be held if the OCR read station is not ready.

OCR Read -- The printed or handprinted numeric amounts are optically read at this station. Up to three fields of numeric information from each document may be read and stored in the buffer for transmission to the CPU. Three types of documents will pass under the scanner and will be treated differently based on the type of document to be read as determined at the MICR I and bar code station.

Document Type -- Check: Document will be scanned to find the amount location. The printed or handprinted amount will be scanned and presented to the recognition logic. Amounts when recognized will be placed in the buffer along with codeline data read at MICR I.

Document Type -- Deposit: The scanner will read individual line items on the deposit ticket. All line items read will be stored internally in the 3895 and used to compare each check or debit document during the scan process to assist in recognition of the amount. The 3895 recognizes the last item read on the deposit ticket or the last line of the last deposit slip in a multiple deposit slip transaction as a total and inserts this in the associated buffer along with the codeline data read at MICR I.

Document Type -- Tape Listing: Adding machine tape lists from customers must be converted to machine processable document sizes. The 3896 Tape-Document Converter performs this operation. Individual line items will be scanned and stored internally in the 3895 and used to compare each check or debit document during the scan process to assist in recognition of the amount. The last item on each list document will be placed in the associated buffer.

Buffer: At the completion of the OCR scan process, a data record for a document is stored in a buffer. This record consists of control information and document data. The control information consists of type, format and size of document and validity status of the MICR and OCR fields.

The data section consists of the MICR and OCR data fields read from the document. The contents of the buffer are sent to the CPU upon a request issued by the user application program.

The 3895 waits for the user application program to process the contents of the buffer and send an output record back to the 3895. The output record must contain data and control information. The control information will contain the stacker number and instructions to inscribe and print. The data will consist of the

amount, the transaction code, and/or other data to be inscribed, and the serial number to be printed.

Print: Two types of printing occur at this station. Data to be printed is stored in the buffer. The inscriber/printer inscribes E13B magnetic ink characters as defined in the ANSI Standards X3.2 -- 1970 and X3.3 -- 1970. Any two fields may be inscribed in one pass -- amount and process codes are considered one field. The serial number printer prints at eight characters per inch and has the capability of printing up to 25 positions on the face of the document. The printing by the serial number printer of more than 15 positions or the inscribing of fields other than the amount field will degrade throughput. Numeric digits 0-9, \$, Δ symbols may be printed. Blank may appear in any position.

Limitations: \$ may not be printed in positions 1, 2 and 15. Δ may not be printed in positions 1, 14 and 15. Printing more than 15 positions requires a minimum of 6.9 inch documents from the primary hopper and 7.4 inch documents from the merge hopper. 51-column cards may contain a maximum of 8 positions. Inscribing the auxiliary on-us field requires a minimum of 7-3/8 inch length documents.

MICR II -- The function of this station is to verify that the E13B data inscribed is machine processable.

Endorser -- Documents can be endorsed in one of six fixed positions on the back of the document. During run initialization, the user specifies whether endorsing is active and one of three horizontal print positions. Vertical location of endorsement is specified by the customer and is normally set at the plant. The design of the endorser facilitates operator changing of endorser legends for users who have a requirement to print different endorsements. The date portion of the endorsement is set by the operator.

Stackers: -- Model 1 has six stackers and Model 2 has twelve stackers, each having a capacity of 2-1/2 inches of free standing documents. Stacker pairs 1 and 2, 3 and 4, and 5 and 6 may be used in an overflow mode. Under this mode, only the odd numbered stacker selection is valid. Documents overflow from a full stacker to other pocket in the pair if that stacker is not full. Stackers 1 and 7 are at the top. Stackers 7 through 12 cannot be used in overflow mode.

Document Path -- The document path is generally in the shape of a broad U, starting at the primary hopper located near the upper right corner, as viewed from the front of the machine. From here the documents feed downward through the aligner, the first MICR read station and the bar code reader, then to the left through the pre-scan, optical scanner, inscriber/printer, second MICR read, and endorse stations. Documents are then fed upward into the stackers. The merge documents follow the same path except that they are fed from the merge hopper, which is located to the immediate left of the primary hopper and are sent directly into the scanner station.

Deposit Slip First -- the 3895 internally stores the individual line item amounts from a deposit slip or item list (adding machine tape) and compares each check as it is read with the stored amounts. This reduces substitutions and improves the OCR performance. Therefore, deposits must be trayed so that a list of the items immediately precedes the items to be read. If the checks are listed on the deposit slip, they should follow the deposit slip. If the checks are listed on an adding machine tape, the tape must be converted to a cut-form document processable by the 3895 and identified by a bar code or other means. The segments of the tape should be kept in order and trayed immediately preceding the checks listed.

3895 Document Designer & Printer Kit -- the IBM 3895 Document Designer and Printer Kit contains camera-ready artwork of OCR field guide areas described in the Document Design Guidelines. The kit is used to design and create final artwork for 3895 input documents. The artwork is printed on a stable-base material. The IBM Document Designer and Printer Kit, SX24-3642, may be purchased by the customer from IBM for \$96 each. For addition information, see the 3895 Document Design Guidelines, GA24-3640.

Supplies: MICR ribbon and fabric ribbon

Documents: E13B magnetic characters, print quality and code-line arrangement on the documents must meet the specifications recommended by the American Bankers Association. Intermixed paper and card documents within the following specifications can be processed:

Length -- 123 to 223mm (4.85 to 8.75 inches).

Width -- 70 to 106mm (2.75 to 4.17 inches).

Thickness -- .076 to .178mm (.003 to .007 inches).

Base Weights -- 16 to 44 lbs (basic weight is the weight of 500 sheets of 17" x 11" paper), 60 to 165 grams per square meter.

Grain -- long grain or short grain, except for 16 lb paper, which must be long grain.



3895 Document Reader/Inscriber (cont'd)

Publications:

- General Information - GA24-3645
- Input Document Design Guidelines - GA24-3640
- Input Document Designer and Printer Kit - SX24-3642
- Installation Manual/Physical Planning - GA24-3641
- Machine & Programming Description - GA24-3620.
- Field Coordinate Gauge - GX24-3646

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): **#9903** for 208 V, or **#9905** for 230 V ... must be consistent with system voltage.

[2] Color: **#9041** for red, **#9042** for yellow, **#9043** for blue, or **#9046** for white.

[3] Upending Kit: **#9840** if required ... loan basis, remains property of IBM.

[4] Endorsing: **#9167** for top track, or **#9168** for center track.

[5] Endorsing Ink: **#9145** for black, **#9147** for purple, **#9148** for red, or **#9149** for blue.

[6] Tool Kits: Required for CE maintenance. For Rental Customer -- specify on first 3895 order for a customer. If required for a multiple machine installation, an additional Tool Kit(s) is available. For Purchase Customer -- specify on each 3895 machine order. When installed rental 3895s are purchased, a Tool Kit is to be ordered for each machine. **Specify: #9766** for base machine ... in addition, **#9767** is required for Microfilming (#5110).

Mdl	Monthly Lease Charge (5 yr)	Monthly Use Charge Rate	Purchase*
1	\$14,770	.095/100 docmnts	\$535,000
2	15,170	.099/100 docmnts	550,000

Mdl	Basic Monthly Maintenance Charge	Additional Monthly Maintenance Charge Rate
1	\$810	.095/100 docmnts
2	825	.099/100 docmnts

Plan Offering: Plan C (Monthly Use Plan)
 Maintenance: Available 24 hours/day, 7 days/week
 Metering: I/O Unit (online) Per Call: 3
 Purchase Option: 60% (not applicable to monthly use charges)
 Warranty: B Useful Life Category: 2
 Termination Charge Months: 6 Termination Charge Percent: 20%
 Upper Limit Percent: 5%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (There are no additional installation charges.)

Model 1 to Model 2\$15,000

SPECIAL FEATURES

MICROFILMING (#5110). Provides the capability of microfilming items, either front and back (duplex) or front only (duo), being processed on the 3895. Items are selectively filmed under program control at 3895 document speeds. An eight-digit index number, determined by the user in his program, will be exposed on the film for every other document image recorded on film. During run initialization, the user specifies whether microfilming is active and the mode of filming. A frame mark is recorded on film for each document image for image counting during retrieval. The camera provides a reduction ratio of 50 to 1 and a resolution of 120 lines per millimeter. The film is advanced by a capstan drive system based upon the document width to maximize the use of film. The film cassette, a purchase only item (see M 10000 pages), provides space for take-up of the film as well as the film supply. Capacity of the cassette is 2000 feet of .0027 polyester thin base film. Loading and unloading of film from the cassette into the film transport is automatic under operator control. Approximately 380,000 front and back images of an average intermix of documents can be recorded on 2000 feet of film. The film is spaced six inches every 215 feet to facilitate splicing; if a 49 inch space is required, specify **#9177**. The film can also be advanced under user control. The film to be used is 16mm unperforated thin base microfilm which must be ordered on cores. An 1/8 inch diameter hole must be centrally punched approximately 7 feet from each end of the film. Descriptive information covering this film, cassette, and core on which the film must be wound is available from Corporate Industry Relations/ Product Information, Old Orchard Road, Armonk, New York 10504. **Field Installation:** Yes. **Prerequisite:** Specify **#9767** ... see Specify item [6] - Tool Kits, for details.

Special Feature Prices:

Microfilming	#5110	Monthly Lease Charge (5 Yr)	Monthly Use Charge Rate	Purchase
		\$ 2,725	\$.019/100 dcmnts	\$100,000
Maintenance Charge			Maintenance Charge Rate	
		\$ 120	\$.019/100 dcmnts	

3896 TAPE-DOCUMENT CONVERTER

Purpose: A stand-alone console unit used to convert adding machine tapes into ABA check size documents (tape copy tickets) for input to the 3895 Document Reader/Inscriber. Tape copy (TC) tickets provide deposit information that improves the performance of the 3895.

Highlights: The 3896 is an electrostatic dry copier with a semiautomatic tape feed that will accept single part original noncarbon back adding machine deposit tapes and copy them by tape or tape section onto 95.116mm x 222.250mm (3.666" x 8.750") TC tickets. The 3896 will accept an input tape with a basic weight of 12 lbs to 24 lbs and a minimum length of 88.9mm (3.5") and a width of 3.81mm to 101.6mm (1.5" to 4.0"). Tapes less than 88.9mm (3.5") in length may be manually copied. During the copy cycle the TC tickets are non-mechanically printed with item reference track, tape number, copy number, and a bar code. The bar code is used to identify the document to the 3895 and the other information provides audit trail and balancing aids. TC tickets can be automatically inscribed on the 3895 with a customer account number and identified with both MICR and serial number printing to facilitate further handling and processing on reader sorters.

Speed: A tape feeds in increments (copy cycles) of about 203.2mm (8").

A tape longer than 203.2mm requires additional tape feed and copy cycles. After the first copy cycle which takes 8 seconds, consecutively inserted short tapes or sections of the same tape are copied in 2.4 seconds.

Stacker: At the end of the cycle, a TC ticket is fed into a reversing stacker which stacks the tickets in the correct order for processing in the 3895. Tapes will be ejected into an open container that can be emptied as required.

Operator Controls: Controls are provided among which is a variable control to accommodate varying tape paper reflectances.

Paper Supply: A paper supply drawer holds a 95.116mm (3.666") wide roll of paper supplying paper for the TC tickets. Paper is available from IRD.

Toner: A special cartridge supplying the toner for the 3896 is available

Manuals:

Machine Description & Operator's Guide - GA24-3638
Installation Manual/Physical Planning - GA24-3643.

Supplies: copy paper and toner cartridges

Power Requirements: Refer to Physical Planning Manual.

Mdl	Monthly Lease Charge (5 yr)	Monthly Use Charge Rate	Purchase*
1	\$1,400	.0106/copy	\$42,500
Mdl	Basic Monthly Maintenance Charge	Additional Monthly Maintenance Charge Rate	
1	\$ 265	.0106/copy	

Plan Offering: Plan C (Monthly Use Plan)
 Maintenance: Available 24 hours/day, 7 days/week
 Metering: Standalone Warranty: B Per Call:1
 Purchase Option: 55% (not applicable to monthly use charges)
 Upper Limit Percent: 5% Useful Life Category: 2
 Termination Charge Months: 6 Termination Charge Percent: 20%

* Pilot Test Plan applies: PTP Option Percent, 65%

**IBM 4331 PROCESSOR**

Purpose: Provides the power, control, logic and memory circuitry necessary for the arithmetic, logic and processor storage functions of the 4331 Processor models.

Models	Processor Storage in bytes (see note below)
I1	524,288
J1	1,048,576

Highlights: Depending on the model, can contain up to 1,048,576 bytes of monolithic processor storage ... storage is high density single bit cell design ... data flow is four bytes parallel ... processor storage fetch cycle is 900 nanoseconds for four bytes ... store cycle is 1300 nanoseconds for four bytes ... processor is microcode controlled.

NOTE: The microcode which controls system operations resides in both processor storage and reloadable control storage reducing the processor storage available for user programming. Processor storage available for the user is reduced from that installed by at least 16,384 bytes (when the optional feature, Control Storage Expansion, is installed) or by at least 53,248 bytes (when the optional feature, Control Storage Expansion, is not installed). Table 1 below lists the storage requirements for system microcode.

Standard Functions are:

- 524,288 bytes or 1,048,576 bytes of processor storage. (4331 Processor configurations require a portion of processor storage to be allocated for system microcode use. See Table 1 below for details.)
- ECPS: VSE mode or System/370 mode. In System/370 mode, both Extended Control (EC) and Basic Control (BC) are available. The 4331 Processor operates in either System/370 mode or in Extended Control Program Support: VSE mode. The system mode is selectable at Initial Program Load (IPL) time and determines the base operating characteristics of the machine. System/370 mode allows operation of certain releases of OS/VS1, VM/370, DOS/VSE, DOS/VS, and DOS. (See Programming Note below for details.) ECPS: VSE mode supports operation of an appropriately generated DOS/VSE, offering enhanced systems performance.
- Display/Printer Adapter allows attachment of:
 - 3278 Display Console mdl 2A, keyboard and control panel.
 - 3262 Line Printer mdl 1.
 - 3289 Line Printer mdl 4.
 - 3278 model 2 display stations and keyboards.
 - 3287 Printers mdls 1 and 2.
- The System Diskette Facility is the microcode loading system for the 4331 Processor. The diskette facility reads and writes from removable magnetic diskettes that provide all of the microcode for the 4331 Processor. The diskettes shipped with the 4331 Processor will supply the required microcode for diagnostics, standard functions, and the special features ordered. The System Diskette Facility also allows storage of failure data from 4331 Processor errors which can subsequently be analyzed by the IBM Customer Engineer for maintenance purposes.
- Each 4331 Processor includes 65,536 bytes of reloadable control storage provided in addition to processor storage. (An additional 65,536 bytes is available as a special feature.) This provides storage space for a portion of system microcode in support of standard functions and special features of the 4331 Processor. The reloadable control storage is not available to the user. Table 1 lists the reloadable control storage requirements for system microcode.
- Remote Support Facility (RSF) is an IBM CE tool permitting the IBM Field Technical Support Center specialists to remotely monitor and/or control problem diagnosis in the 4331 Processor. This includes remotely-initiated execution of diagnostic programs, remote examination of all or selected logout records from the System Diskette Facility, and, (with proper customer authorization), remote exercise of the Customer Manual Operations.
- One level addressing facility for improved virtual storage control by DOS/VSE (ECPS: VSE mode).
- Channels with virtual storage addressing (ECPS: VSE mode).
- S/370 Universal Instruction Set.
- CE maintenance support functions.
- Storage Protection (Store and Fetch).
- Byte Oriented Operands.
- Clock Comparator and CPU Timer.
- Time of Day Clock.
- Interval Timer.
- Conditional Swapping.
- PSW Key Handling.
- Control Registers.
- Extended Precision Floating Point.
- Machine Check Handling.
- Program Event Recording.
- Channel Indirect Data Addressing (in System/370 mode).
- Monitoring.
- Clear I/O

Programming Note: The ECPS: VSE mode may be evoked at IPL time and supports operation of DOS/VSE.

When System/370 mode is IPL'ed, operation of DOS/VSE, VM/370 Release 6 and OS/VS1 Release 7 are supported. DOS/VS Release 34 is supported on the 4331 Processor in System/370 mode until December 31, 1979. VM/370 Release 5 with a PLC available 8/79 runs in System/370 mode and is supported until December 31, 1979. NOTE: VM/370 Release 5 and DOS/VS Release 34 only support I/O machines previously supported on S/370. Although not supported, DOS Release 26 will run on the 4331 Processor when in System/370 mode.

Console Function: An operator's display, keyboard and control panel is a prerequisite for use of the system by the customer ... a 3278 Display Console mdl 2A is required for this purpose ... the display and keyboard function as an operator's I/O console to communicate with the operating system ... the Operator Control Panel allows additional operator communication with the system. Depending on the mode of console operation, a maximum of 20 of the 25 lines on the display may be used for system communication, four are reserved for messages from the 4331 Processor hardware system, and one displays messages unique to the 3278 Display Console mdl 2A. The console address is selected at system installation time from the range 009 through 01F.

The console functions in one of two modes, "Display Mode" or the optional "Printer-Keyboard Mode." In the "Printer-Keyboard Mode", the display console uses the keyboard for input and the display and a 3287 Printer mdl 1 or 2 for output. The CRT, keyboard and printer appear to the system as a 1052 Printer-Keyboard and operate compatibly with S/360 console operations or as a 3210/3215 Console Printer-Keyboard and operate compatibly with S/370 console operations.

In "Display Mode" the keyboard is used for input and the CRT with 20 lines by 80 characters/line is used for output. The 3287 mdl 1 or 2, if attached, has its own address and must be supported by either the 3277 Console Support of DOS/VS Release 34, the 3277 Console Support of DOS/VSE, the Multiple Console Support of OS/VS1, the local-attached 3286/3287 Printer support of VM/370, or the equivalent of any of these.

Byte Multiplexer Channel (optional): Functionally equivalent to the byte multiplexer channel on S/360 and S/370 ... provides 8 control unit positions ... certain control units require an optional feature (Power Interface #5531, #5532) for on-off and Instantaneous Power Off control. See Special Features and Table 3 below for details. The channel permits simultaneous operations of many low speed devices ... operates at 18K bytes per second in single byte mode ... up to 500K bytes per second in burst mode. See IBM 4331 Channel Characteristics, GA33-1527, for devices which may attach and for the data rates achievable for certain configurations. The Byte Multiplexer Channel is always addressed as channel 0.

Block Multiplexer Channel (optional): Provides 8 control unit positions ... certain control units require an optional feature (Power Interface #5531, #5532) for on-off and Instantaneous Power Off control. See Special Features and Table 3 below for details. Data rate is .5 million bytes per second (see IBM 4331 Channel Characteristics, GA33-1527, for details). The Block Multiplexer Channel permits simultaneous operation of high speed devices ... ability to "Block Multiplex" and facility for multiple requesting allows several I/O units to operate concurrently with greater channel efficiency. Devices attached to these channels which cannot utilize block multiplexing will function as if attached to selector channels ... 33xx devices (and the 3830 Storage Control Unit) do not attach ... see DASD Adapter for attachment of 3340 devices. Standard channel address is 1; a different address may be selected at installation time (from the range of 2 to 6).

Native I/O Adapters: The following I/O adapters control the designated I/O devices. Because there is a close relationship between the adapter hardware, the attached I/O device(s) and the required microcode, certain I/O adapters must be installed/removed with the related devices, since the system is

**4331 Processor (cont'd)**

inoperative with only the adapter installed. The adapters affected are:

- DASD Adapter
- 5424 Adapter
- 8809 Magnetic Tape Unit Adapter

The adapters which may be installed without their I/O devices are:

- Display/Printer Adapter Expansion
- Communications Adapter

NOTE: All data passing through the system for any I/O device interferes with the data flow for other devices, producing I/O limitations. The limitations take two forms:

- 1) Hardware exclusivities listed in the sales manual text.
- 2) I/O attachments which individually or in combination can produce frequent overruns. Considerations in this category are:
 - The aggregate data rate on the Block Multiplexer Channel and the DASD Adapter.
 - The number and speed of lines attached to the Communications Adapter.
 - The number and class of overrunnable devices on the Byte Multiplexer Channel.
 - The number and traffic on 3278-2s attached to the Display/Printer Adapter.

It is necessary to consult the IBM 4331 Channel Characteristics Manual, GA33-1527, to properly configure a 4331 with an I/O configuration that has not been previously analyzed.

DASD Adapter (optional): Attaches 3370, 3310 and/or 3340 Direct Access Storage Devices without the necessity of a control unit. Optimum DASD and systems performance is achieved when 3370 Direct Access Storage and/or IBM 3310 Direct Access Storage are attached and operate in fixed block mode. As an aid to easy transition and to facilitate installation with 4341 Processors and S/360 and S/370, emulation of 231X on 3310 and direct attachment of 3340 DASD are available.

3340 devices attaching to the DASD Adapter have logical unit/device addresses of X00 through X07, and X10 through X17.

By installation of a special feature, the DASD Adapter can read data from an IBM 3348 Data Module which was recorded on a 3340 attached to an IBM System/3 mdl 12 or 15 ... this is a read-only mode and is available as a conversion aid for users converting to the 4331 Processor from a System/3. Addresses are X00 through X07 and X10 through X17.

All 3310 devices which attach are addressable in the range of X40 through X43, X50 through X53, X60 through X63, and X70 through X73. The 3370 devices attached to the DASD Adapter are addressable in the range of X20 - X27, and X30 - X37 ... when other addresses or more than two strings of 3370 are required, a utility program included as a part of CE Manual Operations is used to assign up to four control unit addresses in the range of 0 - 7. Standard channel address is 2, but alternatives may be selected at installation time (within the range of 1 to 6) ... unit and device addresses are assigned at system installation time, within the ranges specified above.

Display/Printer Adapter (standard): This adapter allows for attachment of the prerequisite 3278 Display Console mdl 2A and up to seven (or fifteen with optional feature ... see below) additional devices chosen from the list below.

- 3278 Display Station mdl 2s
- 3287 Printers, mdls 1 and 2
- 3262 Line Printer, mdl 1
- 3289 Line Printer, mdl 4

These machines may be installed in any combination, provided that (1) only seven (or fifteen with optional feature) devices are installed and (2) no more than two system printers (3262 mdl 1 and/or 3289 mdl 4) are installed.

The 3262 mdl 1 or the 3289 mdl 4 line printers may be used as system printers for DOS/VSE and VM/370. The 3262 mdl 1 will be supported on the 4331 Processor by the most recently announced release of VM/BSE which is available at the FCS of the 3262. One 3287 Printer may be used as a console hardcopy device; one or more 3287 Printers may be used as hardcopy workstation devices ... the 3278 Display Station mdl 2s may be used as additional operator's consoles (with the presence of OS/VS1 Multiple Console Support or equivalent) or as workstations for user-written applications. Display/Printer Adapter support includes all standard functions of the 3274 mdl 1B with the 3278 mdl 2 attached except for Cursor Select, Device Cancel Key, Print Key, Print Ident Key, Keyboard Numeric Lock, and Click Key. In addition, the following 3278 mdl 2 special features are supported: Audible Alarm, Security Keylock, and Switched Control Unit. When used as workstations, 3278 Display Station keyboard feature

codes #4621, #4622, #4623, #4624 may be selected ... if two different keyboards are required for workstation applications, one must be #4621. Addresses for these devices are selected at installation time from the range 009 through 01F.

Display/Printer Adapter Expansion (optional): Expands the capability of the standard Display/Printer Adapter to permit the 3278 Display Console mdl 2A and up to 15 displays and/or printers to directly attach to the 4331 Processor. All other capabilities and limitations are listed under Display/Printer Adapter (standard) above.

Diskette Drive (optional): A single drive diskette reader/recorder providing the ability to read or write IBM Diskettes Type I on the 4331 Processor. This diskette has a data capacity of 242,944 bytes organized in 1898 sectors of 128 bytes each (for use in exchanging data with the several products listed below) or a data capacity of 246,272 bytes organized in 1924 sectors of 128 bytes each (for use in exchanging data with another 4331 Processor). Each Diskette Drive is supported by the control program as an IBM 3540 Diskette Input/Output Unit as a sequential DASD. Data recorded on an IBM Diskette Type I can be interchanged with IBM devices and systems which have a diskette drive. Examples are the IBM 3740, 3770, 3790, 5230 and 8100; and General Systems Division (GSD) Series/1, and Systems 3, 32, 34 and 38. One diskette is shipped with the feature ... additional diskettes are available. Device address is selected at installation time from the range 009 through 01F.

5424 Adapter (optional): Provides native attachment of 5424 Multifunction Card Unit mdls A1 or A2 for 96 column card operations. Device address is 04C.

8809 Magnetic Tape Unit Adapter (optional): Provides native attachment of 8809 mdl 1A and up to 5 additional 8809 tape units (consisting of a mix of 8809 mdls 2 and 3). Allows the 8809 Magnetic Tape Unit to operate in streaming mode (data rate is up to 160K bytes per second) for loading or offloading DASD devices or in start/stop mode (data rate is up to 20K bytes per second) for other data processing operations. Standard channel address is 3. Channel and device addresses may be assigned at system installation time from the range of X00 to X7F, where X is 1 to 6.

Communications Adapter (optional): The 4331 Communications Adapter can serve up to eight communication lines. Synchronous Data Link Control (SDLC), Binary Synchronous Communications (BSC) and Start/Stop (Asynchronous) transmission modes are provided, and two of the three may be installed on one system. (Start/Stop and BSC operate in 2703 Compatibility Mode.) The Communications Adapter can handle a variety of terminals (Data Terminal Equipments, DTEs), at different speeds.

The Communications Adapter has the following overall structure: The Communications Adapter Base contains common circuits and control. Each of the up to eight telecommunications lines attachable requires one Line Attachment Base (two different types) and one line attachment feature. Another feature serves for autocal unit interface and two may be installed.

The interface with the external communication facilities is through a modem (also called signal converter or Data Circuit-terminating Equipment). It may be a stand-alone unit or a 1200 bps integrated modem. For further details refer to "Special Features."

Attachments to Telecommunications Lines:**IBM Stand Alone Modems****Switched**

3863-2	1200/2400 bps
3872	1200/2400 bps
3864-2	2400/4800 bps
3874	2400/4800 bps

Non-Switched

The following modems are supported with the Switched Network Backup feature ... see 3863, 3864, 3865, 3872, 3874, 3875 for details

3863-1	1200/2400 bps
3872	1200/2400 bps
3864-1	2400/4800 bps
3874	2400/4800 bps
3875	3600/7200 bps
3865	4800/9600 bps

IBM Integrated Modem (V23, 1200 bps)

The following integrated modem configurations are available:

- Switched network with auto answer
- Non-switched line, 2 or 4 wires
- Switched network with manual answer
- Non-switched line with switched network backup and auto answer



4331 Processor (cont'd)

- Non-switched line with switched network backup with manual answer

OEM Modems: OEM modems that comply with EIA RS 232C, CCITT V24/V28, or CCITT V35 recommendations may be connected to the Communications Adapter. Attachment is under the provisions of the Multiple Supplier Systems Policy.

Digital Data Service Adapter: The Digital Data Service Adapter allows attachment to the American Telephone and Telegraph Private Line Dataphone* Digital Service Network by way of an internal Digital Data Service (DDS*) Adapter.

Automatic Calling Equipment: The following Automatic Calling Equipment, maximum two, can be attached to the Communications Adapter:

- 3872 with Automatic Call Originate feature
- 3874 with Automatic Call Originate feature
- Other Automatic Calling Equipment which complies with EIA RS 366 or CCITT V25 may be connected to the Autocall Unit Interface (#1020) under the provisions of the Multiple Supplier Systems Bulletin.

System Subchannels

Byte Multiplexer Channel: The 4331 Processor with a Byte Multiplexer Channel (#5248) provides up to 31 subchannels, 4 of which are shared subchannels supporting from 1 to 16 devices each. The maximum number of subchannels is reduced from 31 with the addition of certain special features:

Feature	Subchannels unavailable
DASD Adapter (#3201)	2
8809 Magnetic Tape Unit Adapter (#4910)	2
Block Multiplexer Channel (#1421)	1
Communications Adapter (#1601)	1
Each telecommunications line on the Communications Adapter	1

Block Multiplexer Channel: Provides up to 40 subchannels where up to 8 may be shared subchannels with 16 devices each.

Allows either:

- 1) 32 subchannels plus 8 shared subchannels with 16 devices each, or
- 2) 32 subchannels plus 4 shared subchannels with 32 devices each.

Prerequisites: Each system requires an operator's display, keyboard and control panel to allow Initial Microcode Load (IML) and interaction with the hardware/software system. A 3278 Display Console mdl 2A with keyboard is required for this purpose.

Bibliography: GCXX-XXXX (to be announced)

SPECIFY:

- [1] Voltage (single phase, 3 wire, 60Hz): #9902 for 208V, or #9914 for 240V.
- [2] Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.
- [3] Minimum Systems: See "Minimum Configurations" in "Systems" for minimum I/O units required for the 4331 Processor.
- [4] Remote Support Facilities (RSF): #9510 if the customer will use RSF. Specifying #9510 means that RSF can be used with the 4331 Processor; however its use in any maintenance situation is not required. Remote Support Facility utilization is always a customer option. When the facility is utilized, the customer must provide the telephone lines required for the Remote Support Facility modem. The customer must also arrange for the connection of the telephone interface cable provided by IBM to the telephone network.

* Dataphone and DDS are registered trademarks of The American Telephone and Telegraph Company. Other usage of Dataphone and DDS in this text also refers to the registered trademarks of American Telephone and Telegraph.

[5] When 3278 mdl 2s are attached to the Display/Printer Adapter or the Display/Printer Adapter Expansion (special feature) select one of three options below:

	For Any or All 3278-2 Displays and 3287 Printers		
	EBCDIC		ASCII**
	Typewriter Keyboard	Data Entry Keyboards	Typewriter Keyboards
Option 1 (EBCDIC typewriter only)	Typewriter is available for any keyboard without further Specify Codes	None Attached	None Attached
Option 2 (EBCDIC typewriter and data entry)	Typewriter is available for any keyboard without further Specify Codes	Specify: (1) #9442' and (2) either #9301' for Data Entry (typewriter layout) or #9302' for Data Entry (keypunch layout)	None Attached
Option 3 (EBCDIC and ASCII typewriter)	Typewriter is available for any keyboard without further Specify Codes	None Attached	Specify: #9441'

** ASCII keyboards are supported as indicated, but the internal binary codes are EBCDIC.

[6] Console Table. A console table is available ... see Accessories pages for details.

[7] See 3278 Display Console mdl 2A for console cabling.

[8] Shipping Instructions: Unless otherwise specified, shipping dimensions of the 4331 Processor are 62-3/4" x 32" x 39-1/2". If a reduction in dimensions is required, specify #9570. Shipping dimensions will then be 60" x 29-1/2" x 38-1/2".

[9] System Environment: For record purposes specify one of the following codes (reference only, no parts required):

- #9701 -- This processor is planned to be host/peer connected to a system within the same branch office territory (at installation or at a future time).
- #9702 -- This processor is planned to be host/peer connected to a system in a different branch office territory (at installation or at a future time).
- #9703 -- This processor is planned to be standalone (no host/peer connect).

Microcode Storage Requirements: The system microcode resides in both the reloadable control storage and the processor storage, and is loaded from the standard system diskette facility at IML time. None of the reloadable control storage is available for user programming and the systems configuration selected will determine the processor storage available for user programming and operating system residence.

To calculate the amount of processor storage which is available for customer purposes and operating system residence, and to determine when Control Storage Expansion (#1901) is required, use the following procedure.

- 1) Consulting Table 1, determine the microcode groups required to support the features and I/O to be installed.
- 2) On the Table 2, place a checkmark in the appropriate rows. Note that each microcode group is required only once, even if it supports multiple functions of the 4331 Processor. The only exception to this is microcode group 2 where 2048 bytes of processor storage are required per megabyte of virtual storage as defined in the notes.
- 3) Find the sum of each of the three columns for the required microcode groups.
- 4) The total from column A must pass three tests.
 - When the total from column A exceeds 65,536 bytes, Control Storage Expansion (#1901) is required.
 - When the total from column A exceeds 131,072 bytes, an invalid configuration has been selected.
 - When the total from column A plus the total from column B exceeds 262,144 bytes, an invalid configuration has been selected.
- 5) Subtract the total of column A from either

' System Diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on the same diskette.



4331 Processor (cont'd)

- 131,072 if #1901 is required, or
- 65,536 if #1901 is not required.

6) Subtract the results of step 5 from the total of column B.

7) Add the results of step 6 to the total from column C and round up to the next multiple of 4096.

The results of step 7 determine the amount of processor storage occupied by microcode and should be subtracted from the processor storage size ordered to determine the amount available for the user. Note that in certain circumstances the user may wish to install Control Storage Expansion (#1901) even though step 4 does not indicate that it is required. Use of #1901 may increase the amount of Processor Storage available for user programs.

TABLE 1

Function/Feature Installed	Microcode Group
- 4331 Processor	1
- Processor Storage -- in S/370 mode, one req'd.	2
in ECPS: VSE mode, one req'd per megabyte of Virtual Storage defined for the IPL (up to 16).	2
- 3310 attached (#3201 and #9202)	3, 4, 5, 6
- 3370 attached (#3201 and #9201)	3, 4, 6, 17
- 8809 Magnetic Tape Unit attached (#4910)	3, 4, 6, 7
- 3340 Direct Attach (#7851 and #3201)	3, 6, 8, 15
- System/3 Data Import (#6305 and #3201)	3, 6, 8, 15
- 2311/2314/2319/3310 Direct Access Storage Compatibility (#7901 and #3201 with #9202)	3, 4, 5, 6, 9, 15
- Communications Adapter Base (#1601)	6, 10
- BSC lines installed (#9671-9678)	6, 10, 11
- S/S lines installed (#9681-9688)	6, 10, 12
- SDLC lines installed (#9691-9698)	6, 10, 13
- ECPS:VM/370 (#8701)	16
- 1401/1440/1460 Compatibility (#3950)	14

TABLE 2

Microcode Group	-A- Control Storage (only)	-B- Control Storage or Processor Storage	-C- Processor Storage (only)	Notes
1	33,792	66,816	12,764	
2	-	-	2,048	Group 2 is required once in System/370 mode, and for each 1MB Virtual Storage in ECPS: VSE mode.
3	6,144	24,320	3,150	
4	5,120	12,288	-	
5	-	4,608	11,250	
6	-	-	10,250	
7	6,144	9,728	3,060	Excl. w Group 14
8	9,216	13,312	11,600 plus 8,800/buffer ... 1,800 for a second string of 3340s attached to the DASD Adapter.	
9	-	26,624	1,300 plus 4,096/2311 buffer 7,680/2314 or 2319 buffer	
10	8,192	9,216	2,150	
11*	6,144	-	-	* Only two of three may be selected
12*	5,120	-	-	
13*	12,288	-	1,024	
14	14,336	-	1,800	Excl. w Group 7 & 16
15	-	5,760	200	
16	6,656	-	-	Excl. w Group 14
17	-	9,316	10,000	
TOTAL				

PRICES:	Mdl	MRC	MLC 2 yr	Purchase	MMMC/AMMCR
4331	I1	\$1,862	\$1,585	\$65,000	\$150
	J1	2,086	1,775	72,500	160

Plan Offering: Plan D Purchase Option: 60% Machine Group: D
Warranty: A Useful Life Category: 2 Per Call: 3
Termination Charge Months: 5 Termination Charge Percent: 25%
Initial Period of Maintenance Service: 3 months
Upper Limit Percent: 5%

Model Changes: 4331 model I1 is field upgradable to 4331 model J1.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From 4331 model I1 to model J1 \$7,500

SPECIAL FEATURES

ADAPTER POWER PREREQUISITE (#1001). Provides power and control circuitry necessary for the Communications Adapter (#1601), when more than 3 line features are attached, and the Adapter Logic Prerequisite (#1002). **Maximum:** One. **Field Installation:** Yes.

ADAPTER LOGIC PREREQUISITE (#1002). Provides logic and control function necessary for the 5424 Adapter (#3901). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Adapter Power Prerequisite (#1001).

BLOCK MULTIPLEXER CHANNEL (#1421). Provides means of attaching I/O devices with data transfer rates up to .5 million bytes per second. Up to 8 control units may be attached ... disconnect during command chaining allows multiple I/O devices to operate concurrently. Devices attachable are shown in "Systems" ... 3330/3333/3350/3340/3344 devices do NOT* attach ... see DASD Adapter (#3201) for attachment of 3340 devices. **Maximum:** One. **Field Installation:** Yes. **Limitations:** 2311/2314/2319 devices may not be installed with any of the following: 3370s on the DASD Adapter (#3201 with #9201), 3340 Direct Attachment (#7851), 8809 Magnetic Tape Unit Adapter (#4910), System/3 Data Import (#6305), any telecommunications line feature on the Communications Adapter which runs at a speed greater than 9600 bps (#4720, #5650 with #9444), or magnetic tape units installed on the Byte Multiplexer Channel (#5248). **Specify:** (1) #9491¹ for 8 shared subchannels with up to 16 devices each ... (2) #9492¹ for 4 shared subchannels with 32 devices each. **Prerequisite:** Certain control units require Power Interface Feature (#5531, #5532). See details below.

CONTROL STORAGE EXPANSION (#1901). Increases the control storage capacity of the 4331 Processor from 65,536 to 131,072 bytes, providing additional storage area for special features and the basic functions of the 4331 Processor. See Table 1 above to determine the requirement for this feature. Note that the user may wish to install this feature even if Table 1 and the associated directions do not indicate that it is required. Under some circumstances, use of #1901 may increase the processor storage available for user programs. **Maximum:** One. **Field Installation:** Yes.

DISPLAY/PRINTER ADAPTER EXPANSION (#2001²). Expands the capability of the standard Display/Printer Adapter to allow the 3278 mdl 2A and up to 15 displays and/or printers to directly attach to the 4331 Processor. The devices attachable are:

- Up to fifteen 3278 Display Station mdl 2s
- Up to fifteen 3287 Printer mdl 1s and 2s
- Up to two 3289 Line Printer mdl 4s.
- Up to two 3262 Line Printer mdl 1s.

Other details are the same as given under the description of the Standard Function: Display/Printer Adapter above. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Only the 3278 mdl 2A and 15 devices (listed above) may attach to the Display/Printer Adapter and the Display/Printer Adapter Expansion. **Specify:** See item [5] in Specify list for character code/keyboard combinations available. **Cable Order:** See M10000 pages for ordering information for the required coaxial cable.

DASD ADAPTER (#3201¹). Allows attachment of certain DASD devices to the 4331 Processor. Up to four strings of devices may be attached to the adapter. The attachable device types may be intermixed on the adapter. The maximum number of strings of each type of device on the DASD Adapter is: (a) up to four 3310 mdl A1 or A2s with mdl B units attached to the A2s ... (b) Up to two 3340 mdl A2s with 3340 B units attached ... (c) Up to four 3370 mdl A1s with mdl B1 units attached. **Maximum:** One. **Field Installation:** Yes. **Limitation:** 3310 and 3370 are not supported

¹ System Diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on the same diskette.

² Feature supplies diskette for System Diskette facility.

**4331 Processor** (cont'd)

by VS1. 3370s may not be attached (#9201) to the DASD Adapter if either of the following are installed: (1) 231X DASD attached to the Block Multiplexer Channel (#1421), (2) any telecommunications line on the Communications Adapter which operates at a speed greater than 9600 bps (#4720, or #5650 with #9444). **Specify:** #9202' if 3310 attaches to the DASD Adapter, and/or #9201' if 3370 attaches to the DASD Adapter. **Prerequisite:** See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901).

DISKETTE DRIVE (#3401). A single drive diskette reader/recorder providing the ability to read or write IBM Diskettes Type 1. The Diskette Drive is supported by the control program as an IBM 3540 Diskette Input/Output Unit. **Maximum:** One. **Field Installation:** Yes. **Limitation:** Not supported by VM/370.

EXTERNAL SIGNALS (#3898). Provides six distinct external interrupt lines to request and identify an external interrupt response from the processing unit. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** External devices must meet the interface specifications outlined in S/360 - Direct Control Feature - OEM I, SRL GA22-6845. **Cable Order:** Required.

5424 ADAPTER (#3901²). Allows attachment of one 5424 Multi-function Card Unit mdl A1 or A2. **Maximum:** One. **Field Installation:** Yes. **Limitation:** The 5424 is supported by DOS/VSE only. **Prerequisites:** Adapter Logic Prerequisite (#1002) and Adapter Power Prerequisite (#1001).

1401/1440/1460 COMPATIBILITY (#3950³). A feature which, in conjunction with special software, permits execution of 1401/1440/1460 instructions. Feature may be used with System/370 mode or with ECPS: VSE mode. See "Programming" section of sales manual for details concerning prerequisites. **Maximum:** One. **Field Installation:** Yes. **Limitation:** May not be installed with 8809 Magnetic Tape Unit Adapter (#4910). May not be installed with ECPS:VM/370 (#8701). Support is available under DOS/VSE/Advanced Function, DOS/VS Release 34, and DOS Release 26. **Prerequisite:** IBM Systems 1401/1440/1460 Emulator Program Product. See "Programming" section of sales manual for details. See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901).

8809 MAGNETIC TAPE UNIT ADAPTER (#4910³). Provides for attachment of the 8809 Magnetic Tape Unit. One 8809 mdl 1A may attach. Up to five 8809 mdl 2s and 3s may attach to the mdl 1A for a total of six 8809 Magnetic Tape Unit drives. **Maximum:** One. **Field Installation:** Yes. **Limitation:** May not be installed with 1401/1440/1460 Compatibility (#3950). May not be installed if 231X devices are attached to the Block Multiplexer Channel (#1421). The 8809 is not supported by VS1. **Prerequisite:** See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901).

BYTE MULTIPLEXER CHANNEL (#5248). The byte multiplexer channel attaches S/370 byte multiplex devices. The data rate of the channel is 18K bytes per second in single byte interleaved mode and up to 500K bytes per second in a burst mode. (For data rates achievable for specific configurations see IBM 4331 Channel Characteristics, GA33-1527.) Up to 8 control units may be attached. On the 4331 Processor, up to 31 subchannels are provided (see System Subchannels above for specifics). On each 4331 Processor model, 4 of the available subchannels are shared subchannels for up to 16 devices each. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Magnetic tape devices may not be attached to the Byte Multiplexer Channel whenever 231X devices are attached to the Block Multiplexer Channel (#1421). **Prerequisite:** Certain control units require Power Interface Feature (#5531, #5532). See details below.

POWER INTERFACE (#5531), ADDITIONAL (#5532). Provides power, power control, and Instantaneous Power Off interfaces to the 4331 Processor for control units attaching to the 4331 Byte Multiplexer Channel and Block Multiplexer Channel. Table 3 below lists the control units requiring this feature. Power Interface (#5531) allows attachment of up to 8 of these control units; Power Interface, Additional (#5532) allows attachment of 8 additional control units for a maximum of 16 per processor. **Maximum:** One #5531; one #5532. **Field Installation:** Yes. **Prerequisite:** #5532 requires #5531.

² Feature supplies diskette for System Diskette facility.

³ System Diskette-only special feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchase machines to include any number of diskette-only changes ordered on the same diskette.

TABLE 3

Control units requiring Power Interface features.

1255 Magnetic Character Reader
1287 Optical Reader
1288 Optical Reader
1419 Magnetic Character Reader
1442 Card Read Punch mdl N1
1442 Card Punch mdl N2
1443 Printer mdl N1
2314 Storage Control* mdl A1, B1
2314 Direct Access Storage Facility* mdl 1
2415 Magnetic Tape Unit and Control
2501 Card Reader mdls B1, B2
2520 Card Read Punch mdl B1, B2, B3
2701 Data Adapter Unit
2702 Transmission Control*
2703 Transmission Control*
2803 Tape Control
2821 Control Unit mdls 1, 2, 3, 5, 6
2822 Paper Tape Reader Control
2840 Display Control
2841 Storage Control
3272 Control Unit
3411 Magnetic Tape Unit and Control
3505 Card Reader
3540 Diskette Input/Output Unit
3704 Communications Controller
3705 Communications Controller
3791 Controller
3800 Printing Subsystem
3803 Tape Control
3811 Printer Control Unit
3881 Optical Mark Reader mdl 1
3886 Optical Character Reader mdl 1
3890 Document Processor
3895 Document Reader/Inscriber

* No longer available.

PRINTER-KEYBOARD MODE (#5550³). Allows the 4331 Processor user to run an operating system which has been generated for use either on (1) an IBM S/360 with a 1052 Printer-Keyboard as operator console, or (2) an IBM S/370 with a 3210/3215 Console Printer-Keyboard used in conjunction with the standard system keyboard, display and 3287 Printer. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** 3287 Printer.

SYSTEM/3 DATA IMPORT (#6305³). A feature which allows attachment of IBM 3340-A2s for the purpose of reading data from a 3348 Data Module which had been written by an IBM System/3 mdl 12 or 15. Up to two 3340-A2s may attach ... up to three 3340 model B units may attach to each 3340-A2. The 3348 Data Module is read on a model A or B drive in a 3340 string attached via the DASD Adapter (#3201). **NOTE:** The 3340 mdl C2 may not attach. However, 3348 Data Modules recorded on the 3340 mdl C2 can be read when the module is installed on a 4331-attached 3340 A or B model. This feature works in conjunction with VSE/IBM System/3-3340 Data Import program ... see Programming section of sales manual for details. **Maximum:** One. **Field Installation:** Yes. **Limitation:** May not be installed if 231X devices attach to the Block Multiplexer Channel (#1421). The utility program supporting this feature operates only under DOS/VSE. **Prerequisites:** 3340-A2 DASD and Feature Code #3201. See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901). **NOTE:** Feature #7851 is NOT required as a prerequisite.

3340 DIRECT ATTACHMENT (#7851³). A feature allowing 3340 mdl A2s to attach to the DASD Adapter (#3201) and operate with DOS/VSE, DOS/VS, OS/VS1 or VM/370 ... may attach up to two 3340 mdl A2s. Up to three 3340 model B units may attach to each 3340 mdl A2. **NOTE:** Use of this feature introduces additional processor and channel demands and may have an effect on systems performance. **Maximum:** One. **Field Installation:** Yes. **Limitations:** (a) May not be installed if 231X devices attach to the Block Multiplexer Channel (#1421)... (b) A maximum of two strings of 3340s may attach ... (c) If one string of 3340s is attached to a DASD Adapter (#3201) then only one string of 3310s can perform DASD emulation (#7901). If two strings of 3340s are attached to a DASD Adapter (#3201) no 3310s can perform DASD emulation (#7901). **Prerequisites:** DASD Adapter (#3201) ... 3340 mdl A2. See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901). (**Note:** that the storage requirements are greater for two strings of 3340 than for one string.)

2311/2314/2319/3310 DIRECT ACCESS STORAGE COMPATIBILITY (#7901³). A feature allowing 2311 and 2314/2319 disk data sets to be emulated for DOS, DOS/VS and DOS/VSE operations, on up to two consecutively addressed strings of natively attached 3310 Direct Access Storage attached to the DASD Adap-

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ter. Emulation is done on a 231X volume basis mapped into pre-defined areas of the 3310 as follows:

- up to 7 x 2311 volumes into one 3310 drive for a maximum of 28 volumes per 3310 string
- up to 2 x 2314/2319 volumes into one 3310 drive for a maximum of 8 volumes per 3310 string.

(It is possible to emulate 231X "Mini Volumes", and each successive 231X Mini Volume emulated on the 3310 begins on a 231X full volume boundary.)

Use of this feature allows programs written for DOS, DOS/VS, or DOS/VSE and 2311/2314/2319 DASD to be executed, with only JCL modifications, using the 3310 Direct Access Storage. Operates when either System/370 mode or ECPS: VSE mode has been IPL'ed. Data sets in fixed block mode may be intermixed on the same 3310 volume with 231X emulated data sets but may be accessed concurrently only when ECPS: VSE mode is active. NOTE: Use of this feature introduces additional processor and channel demands and may have an effect on systems performance. **Maximum:** One. **Field Installation:** Yes. **Limitations:** (a) 2311/2314/2319 emulation only operates on up to two 3310 mdl A2s and the 3310 mdl Bs attached to them ... (b) If one string of 3310s performs emulation of 231X devices using this feature, then the DASD Adapter (#3201) can only support one string of 3340s using feature #7851. If two strings of 3310s perform emulation of 231X devices using this feature, then the DASD Adapter may not support direct attachment of 3340s through feature #7851 ... (c) Does not operate with OS/VS1 or VM/370 ... (d) The feature supports both 2311 and 2314/2319 emulation but either 2311 or 2314/2319 must be selected at each IPL, not both. **Prerequisites:** DASD Adapter (#3201). 3310 Direct Access Storage ... see "Machines." See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901). **Program Order:** Required for 3310 compatibility initialization routines. Order number 5747-SA1.

ECPS:VM/370 (#8701³). The 4331 Processor provides ECPS:VM/370 support at Level 19. This support is compatible with VM/370 Release 6 and corresponding levels of the System Extension program products. This level is also compatible with the PLC that will provide VM/370 Release 5 support for the 4331. The functional areas assisted include: Virtual Machine I/O, SVC Handler, Privileged Instruction Emulation, and Virtual Interval Timer. **Maximum:** One. **Field Installation:** Yes. **Limitation:** May only operate when System/370 mode has been invoked by IPL. May not be installed with 1401/1440/1460 Compatibility (#3950). **Prerequisite:** See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901).

COMMUNICATIONS ADAPTER

Provides the basic control and common circuits for the direct attachment of up to 8 synchronous (BSC), asynchronous (Start/Stop) or Synchronous Data Link Control (SDLC) communication lines in any combination, provided that only two of the three types are installed and that the aggregate data rate capability of up to 64,000 bps is not exceeded. For data rates achievable, see GA33-1527. The maximum speed of each of the 8 lines is 9600 bps except one of the 8 line positions may be a synchronous high speed line (BSC or SDLC) up to 56,000 bps and may operate concurrently with other lines provided that the data rate limitations are not exceeded. The Communications Adapter operates with Start/Stop and BSC in 2703 Compatibility Mode. SDLC is supported only by ACF/VTAME operating under DOS/VSE, or ACF/VTAME operating under VM/370 Release 6 with DOS/VSE running as a guest.

Base characters are:

- Auto Answer
- Autopoll operation
- Multipoint station functions
- EBCDIC transparent mode for BSC only
- EBCDIC and ASCII code for BSC only

The Communications Adapter attaches up to eight lines via the following optional features:

- Up to 8 line features without internal clock for attachment to external modems (Data Circuit-terminating Equipment, DCE) with clock.
- Up to 8 line features with internal clock for attachment to external modems (Data Circuit-terminating Equipment, DCE) without clock.
- Up to 1 synchronous high speed line feature.
- Up to 8 line features with integrated modems.
- Up to 8 line features with local attachments.
- Up to 8 line features with Digital Data Service Adapters.
- Autocall Unit interfaces for up to two of the installed lines.

³ System Diskette-only special feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchase machines to include any number of diskette-only changes ordered on the same diskette.

From the Display Console keyboard the user may specify some configuration parameters for each separate telecommunications line for each individual connection:

- select stand-by
- half speed operation for synchronous lines only (for both clocked and nonclocked modems which have this capability).
- NRZI mode in SDLC mode.
- write interrupt (S/S only).
- read interrupt (S/S only).
- unit exception suppression (S/S only).
- error index byte mode (BSC only).
- ASCII code instead of EBCDIC (BSC only).

Other configuration parameters can be selected at installation time and set by the IBM Customer Engineer.

- duplex instead of half duplex connection (two way alternate data flow transmission).
- switched network facility instead of non-switched lines (for external modems).
- new sync (for BSC or SDLC in multipoint primary station function only).
- high speed operation for one line (BSC or SDLC only).
- connect Data Set to Line or Data Terminal Ready procedure.
- selection of WE202 or V.23 answer tone frequencies for 1200 bps integrated modems with automatic answering.

Customer Responsibilities: See M 2700 pages for customer responsibilities regarding communications facilities and services.

Communication Facilities: See M 2700 pages for communications facility requirements with this feature.

Terminals Supported: The Data Communications Equipment and remotely attachable Data Terminal Equipment (abbreviated "terminals") supported by the Communications Adapter are shown in the table below:

TYPE	SDLC TERMINALS SUPPORTED								
	SPEED IN KBPS								
	1.2/ 0.6	2.4	1.2	4.8	2.4	7.2	3.6	9.6	20.4- 56.0
Terminals:									
3271-11,12 (3)	X	X	X	X	X	X	X	X	X
3274-1C			X	X	X	X	X	X	X
3275-12 (3)	X	X	X	X	X	X	X	X	X
3276-11-14	X	X	X	X	X	X	X	X	X
3601	X	X	X	X	X	X	X	X	X
3602	X	X	X	X	X	X	X	X	X
3614	X	X	X	X	X	X	X	X	X
3624	X	X	X	X	X	X	X	X	X
3631	X	X	X	X	X	X	X	X	X
3632	X	X	X	X	X	X	X	X	X
3651-25, 75	X	X	X	X	X	X	X	X	X
3651-A50/B50	X	X	X	X	X	X	X	X	X
3651-A60/B60	X	X	X	X	X	X	X	X	X
3661	X	X	X	X	X	X	X	X	X
3684-1, 2	X	X	X	X	X	X	X	X	X
3767-1-3	X	X	X	X	X	X	X	X	X
3771-1-3	X	X	X	X	X	X	X	X	X
3774-1,2,P1,P2	X	X	X	X	X	X	X	X	X
3775-1,P1	X	X	X	X	X	X	X	X	X
3776-1,2	X	X	X	X	X	X	X	X	X
3776-3,4	X	X	X	X	X	X	X	X	X
3777-1,2,3	X	X	X	X	X	X	X	X	X
3791	X	X	X	X	X	X	X	X	X
Controllers:									
3705 (1)	X	X	X	X	X	X	X	X	X
Systems:									
4331 (2)	X	X	X	X	X	X	X	X	X
5320 (5)	X	X	X	X	X	X	X	X	X
5340 (5)	X	X	X	X	X	X	X	X	X
5380 (5)	X	X	X	X	X	X	X	X	X
8100	X	X	X	X	X	X	X	X	X

Notes:

- 1) 3705 supported as a primary station in a network using ACF/VTAM Release 1 or ACF/VTAM Release 2.
- 2) Participant as a primary or a secondary station in a network using ACF/VTAM Release 1 or ACF/VTAM Release 2.
- 3) Not supported by ACF/VTAME.
- 5) Supported as a 3770.



4331 Processor (cont'd)

BSC TERMINALS SUPPORTED

TYPE	SPEED IN KBPS									
	1.2/ 0.6	2.4	2.4/ 1.2	4.8	4.8/ 2.4	7.2	7.2/ 3.6	9.6	20.4- 56.0(6)	
Terminals:										
3271-1,2	X	X	X	X	X	X	X			
3274-1C	X	X	X	X	X	X	X			
3275-2	X	X	X	X	X	X	X			
3276-1-4	X	X	X	X	X	X	X			
3631 (7)	X	X	X	X	X	X	X		X	
3632 (7)	X	X	X	X	X	X	X		X	
3651-25, 75		X	X	X	X					
3651-A60,B60		X								
3661		X								
3684-1, 2	X	X	X	X	X					
3735	X	X	X	X	X					
3741-2,4	X	X								
3747	X	X								
3771 (2)	X	X	X	X	X					
3774, 3775 (2)	X	X	X	X	X					
3776-1,2 (3)		X	X	X	X					
3777-1,2 (3)		X	X	X	X	X	X		X (1)	
3780	X	X	X	X	X	X	X			
5231-2 (9)	X	X	X	X	X					
Controllers:										
2701(w360/370)	X	X	X	X	X	X	X			
3704	X	X	X	X	X	X	X		X	
3705	X	X	X	X	X	X	X		X	X
Systems: (5)										
3115	X	X	X	X	X	X	X		X (1)	
3125	X	X	X	X	X	X	X		X (1)	
3135	X	X	X	X	X	X	X			
3138	X	X	X	X	X	X	X			
4331	X	X	X	X	X	X	X		X	X
5010 (8)	X	X	X	X	X	X	X			
5320 (8)	X	X	X	X	X	X	X			
5340 (8)	X	X	X	X	X	X	X		X	
5404	X	X	X	X	X	X	X		X	
5406	X	X	X	X	X	X	X		X	
5408	X	X	X	X	X	X	X		X	
5410	X	X	X	X	X	X	X		X	
5412	X	X	X	X	X	X	X		X	
5415	X	X	X	X	X	X	X		X	
8100 (4)	X	X	X	X	X	X	X		X	
Series 1 (8)	X	X	X	X	X	X	X		X	

Notes:

- 1) By RPQ.
- 2) Equivalent to 2770/2772.
- 3) Equivalent to 2770/3780.
- 4) Supported as a remote 3276.
- 5) With Communications Adapter.
- 6) 19,200 - 56,000 bps in line position 1.
- 7) See 3631 and/or 3632 in Machines for 3631/3632 features required and software requirements for host connection.
- 8) Equivalent to 54XX (System/3) under RPS V3/V4.
- 9) Equivalent to 3741-2, 4.

START/STOP TERMINALS SUPPORTED

Only terminals using IBM Terminal Control - Type 1 are supported.

TYPE	IBM Line Control Speed in BPS				
	75	134.5	300	600	1200
2740-1		X			
2740-2	X	X		X	
2741		X			
3767-1, 2, 3 (1)		X	X	X	X
5100 (2)		X	X		
5110		X	X		
CMC Selectric (1)		X	X		

Notes:

- 1) Equivalent to 2740 and/or 2741. 134.5 bps speed needs 3767 RPQ
- 2) Equivalent to 2741.

AUTOCALL UNIT INTERFACE (#1020²). Provides an interface to customer-supplied Automatic Calling Equipment allowing data links with remote stations to be automatically established on the switched telephone network. Automatic Calling Equipment complying with EIA RS 366 or CCITT V25 procedures may be attached. For the appropriate Automatic Calling Equipment, refer to M 2700 pages. **Maximum:** Two. **Field Installation:** Yes. **Limitations:** Does

not operate with High Speed Modem Adapter (#4720), any features with 1200 bps Integrated Modem or with any non-switched lines. **Specify:** Line position ... see Table 4 below. **Prerequisites:** Communications Adapter, Base (#1601) and one EIA/CCITT Interface (#3701) (in switched operation) for each Autocall Unit Interface installed. **Cable Order:** Required, for attachment to external equipment.

COMMUNICATIONS ADAPTER, BASE (#1601²). Allows attachment of up to eight lines (with up to two transmission modes) plus Autocall Unit Interfaces (#1020) for up to two of the lines. The aggregate data rate capability of the Communications Adapter is 64,000 bps. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Line features for only two transmission mode versions may be installed (SDLC and BSC, SDLC and S/S, or S/S and BSC) ... see Table 4 below. SDLC is supported only by ACF/VTAME operating under DOS/VSE, or ACF/VTAME operating under VM/370 Release 6 with DOS/VSE running as a guest. The aggregate data rate capability of the Communications Adapter is 64,000 bps; line features which exceed this aggregate data rate may be installed but not operated concurrently. For data rates achievable see IBM 4331 Channel Characteristics, GA33-1527. When 231X DASD is attached to the Block Multiplexer Channel (#1421) no line feature may be attached which runs at a speed greater than 9600 bps. See features below for details. Each line attached operates with one subchannel of the Byte Multiplexer Channel (#5248). See "System Subchannels" above for details. **Specify:** See Table 4, "Communications Adapter Configuration Features and Position Codes," for required specify codes for each line feature attached. **Prerequisites:** Adapter Power Prerequisite (#1001) is required when more than three telecommunications line features are attached. See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901).

EIA/CCITT INTERFACE (#3701²). This feature may be intermixed with other line features. Each feature provides for the attachment of one external modem having EIA RS 232-C, CCITT V24/V28 interface for attachment to one switched or one non-switched line. When this feature is installed in conjunction with Line Attachment Base for Clocked Modem (#4695), a BSC or SDLC line is supported. Non-switched lines with switched network backup may be used where maximum line speed on non-switched lines is 9600 bps, the maximum line speed on switched network backup or switched networks is 4800 bps. When this feature is installed in conjunction with Line Attachment Base for Nonclocked Modems (#4696), then a BSC, Start/Stop, or SDLC line is supported. Transmission speeds supported are listed with feature #4696 below. **Maximum:** Eight. **Field Installation:** Yes. **Specify:** Start/Stop, SDLC and/or BSC operations are possible ... see Table 4 for Line Position Code and Transmission Mode Codes. **Prerequisites:** Communications Adapter, Base (#1601). One Line Attachment Base for Clocked Modems (#4695) or Line Attachment Base for Nonclocked Modems (#4696) is required for each feature (#3701) installed. **Cable Order:** Required, for attachment to external equipment.

LINE ATTACHMENT BASE FOR CLOCKED MODEMS (#4695²). This feature is a prerequisite for all line adapters which attach to modems (Data Circuit-terminating Equipment) providing clocking. See the various line features below to determine when it is required. **Maximum:** Eight, one per line installed. **Field Installation:** Yes. **Limitations:** A maximum of eight Line Attachment Bases may be installed on each 4331 Communications Adapter. Each feature (#4695) installed reduces by one the number of features (#4696) allowable. **Prerequisite:** Communications Adapter, Base (#1601).

LINE ATTACHMENT BASE FOR NONCLOCKED MODEMS (#4696²). This feature is a prerequisite for all line adapters which attach to modems (Data Circuit-terminating Equipment) which do not provide clocking. See the various features below to determine when it is required. The clock speed internal to the feature is wired by default to 134.5 bps for Start/Stop operation and 1200 bps for BSC and SDLC operation. Otherwise, the clock speed can be wired at installation to one of the following:

- Start/Stop 75, 300, 600 or 1200 bps
- BSC 600
- SDLC 600

For BSC or SDLC operations, if 1200 bps is wired, then full speed operation (1200 bps) or half-speed operation (600 bps) may be selected from the operator console keyboard. **Maximum:** Eight, one per line installed. **Field Installation:** Yes. **Limitation:** A maximum of eight Line Attachment Bases may be installed on each 4331 Communications Adapter. Each feature (#4696) installed reduces by one the number of features (#1601) allowable. **Prerequisite:** Communications Adapter, Base (#1601).

HIGH SPEED MODEM ADAPTER (#4720²). The feature provides for the attachment of an external modem with clock having a CCITT V35 interface. One non-switched point-to-point BSC or SDLC line may be operated with speeds of 20,400, 40,800,

² Feature supplies diskette for System Diskette facility.

**4331 Processor** (cont'd)

48,000 or 56,000 bps. **Maximum:** One. **Field Installation:** Yes. **Limitations:** Operation is with up to 7 other lines, (speeds not exceeding 9600 bps) for the overall aggregate data rate limitation of 64,000 bps. (For data rates achievable see IBM 4331 Channel Characteristics, GA33-1527.) Cannot be installed with 231X DASD attached to the Block Multiplexer Channel (#1421). Cannot be installed with 3370 DASD attached (#9201) to the DASD Adapter (#3201). Cannot be installed with Digital Data Service Adapter (#5650) if the Digital Data Service Adapter operates at 56,000 bps (#9444). **Specify:** BSC and/or SDLC operations are possible ... see Table 4 for Line Position Code and Transmission Mode Codes. **Prerequisite:** Communications Adapter, Base (#1601), Line Attachment Base for Clocked Modems (#4695). **Cable Order:** Required for attachment to the external modem.

1200 BPS INTEGRATED MODEM, NON-SWITCHED (#4781²). This feature may be intermixed with other line features. Each feature provides for the attachment of one non-switched BSC, Start/Stop or SDLC line via an integrated 1200 bps modem. The transmission speed can be strapped by the customer engineer for Start/Stop operation up to 1200 bps and for BSC or SDLC operation at 600 or 1200 bps. Selection of two or four wire operation is made at installation time. **Maximum:** Eight. **Field Installation:** Yes. **Specify:** SDLC and/or BSC and/or Start/Stop operations are possible ... see Table 4 for Line Position Code and Transmission Mode Codes. **Prerequisite:** Communications Adapter, Base (#1601), and Line Attachment Base for Nonclocked Modems (#4696). **Cable Order:** Required for attachment to external equipment.

1200 BPS INTEGRATED MODEM, SWITCHED WITH AUTO ANSWER (#4782²). This feature may be intermixed with other line features. Each feature provides for the attachment of one switched network Start/Stop line via an integrated modem at speeds up to 300 bps and for BSC or SDLC operation at 600 and 1200 bps. Attachment to the switched network is via an IBM provided cable to a Data Access Arrangement type CBS or FCC registered equivalent. **Maximum:** Eight. **Field Installation:** Yes. **Specify:** SDLC and/or BSC and/or Start/Stop operations are possible ... see Table 4 for Line Position Code and Transmission Mode Codes. **Prerequisite:** Communications Adapter, Base (#1601), and Line Attachment Base for Nonclocked Modems (#4696). **Cable Order:** Required for attachment to external equipment.

1200 BPS INTEGRATED MODEM, NON SWITCHED WITH SWITCHED NETWORK BACKUP AND MANUAL ANSWER (#4787²). This feature may be intermixed with other line features. Each feature provides for the attachment of one non-switched line with Switched Network Backup (SNBU) and manual answer, allowing BSC, Start/Stop or SDLC operations via an integrated 1200 bps modem. The transmission speed can be strapped by the customer engineer for Start/Stop operation up to 1200 bps and for BSC or SDLC operation at 600 or 1200 bps. Attachment to the non-switched line is via an IBM provided cable to the common carrier communication line via appropriate Data Access Arrangement. Selection of two or four wire line operation is made at installation time. The cable group which is ordered also provides for attachment to a Data Access Arrangement type CDT or FCC registered equivalent for manual answer. **Maximum:** Eight. **Field Installation:** Yes. **Specify:** SDLC and/or BSC and/or Start/Stop operations are possible ... see Table 4 for Line Position Code and Transmission Mode Codes. **Prerequisites:** Communications Adapter, Base (#1601), and Line Attachment Base for Nonclocked Modems (#4696). **Cable Order:** Required for one cable group which connects to non-switched line and to the switched network.

1200 BPS INTEGRATED MODEM, NON-SWITCHED WITH SWITCHED NETWORK BACKUP AND AUTO ANSWER (#4788²). This feature may be intermixed with other line features. Each feature provides for the attachment of one non-switched line with Switched Network Backup (SNBU) and auto answer, allowing BSC, Start/Stop or SDLC operations via an integrated 1200 bps modem. The transmission speed can be strapped by the customer engineer for Start/Stop operation up to 1200 bps and for BSC or SDLC operation at 600 or 1200 bps. Attachment to the non-switched line is via an IBM provided cable to the common carrier communication line via an appropriate Data Access Arrangement. The same cable group provides for attachment of the switched network to a Data Access Arrangement type CBS or FCC registered equivalent for auto answer. **Maximum:** Eight. **Field Installation:** Yes. **Specify:** SDLC and/or BSC and/or Start/Stop operations are possible ... see Table 4 for Line Position Code and Transmission Mode Codes. **Prerequisites:** Communications Adapter, Base (#1601), and Line Attachment Base for Nonclocked Modems (#4696). **Cable Order:** Required for one cable group which connects to the non-switched line and to the switched network.

LOCAL ATTACHMENT INTERFACE (#4801²). Provides circuits and controls for the local attachment of one BSC or SDLC remote station to the Communications Adapter without the use of modems

at either device. Transmission speed can be strapped at installation time by the customer engineer at 1200, 2400, 4800 and 9600 bps. The feature provides clocking for both the Communications Adapter and the terminal. The attached terminal must be equipped with an EIA RS 232C or CCITT V24/V28 interface, have no Business Machine Clocking and have an external modem cable. The distance to the terminal may be extended via a customer provided cable to allow a maximum distance between Communications Adapter and terminal of:

- 800 meters at 1200 bps
- 400 meters at 2400 bps
- 200 meters at 4800 bps
- 100 meters at 9600 bps

The feature includes cables to attach the Communications Adapter to a customer-provided terminal plate and from the terminal plate to the DTE external modem cable. **Maximum:** Eight. **Field Installation:** Yes. **Specify:** SDLC and/or BSC operations are possible ... see Table 4 for Transmission Mode and Line Position Codes. **Prerequisite:** Communications Adapter, Base (#1601), and Line Attachment Base for Clocked Modems (#4695). **Cable Order:** Required for attachment to terminal plate.

DIGITAL DATA SERVICE ADAPTER (#5650²). Provides circuits and controls for attachment of one BSC or SDLC line and includes an internal Dataphone Digital Service (DDS) Adapter. The adapter allows interface of American Telephone and Telegraph Private Line DDS Network via the American Telephone and Telegraph Channel Service Unit. The Digital Data Service Adapter will operate at synchronous speeds of 2400, 4800, 9600 and 56,000 bps. The speed must be set to the speed specified in the customer's order for service to the common carrier at installation time. These line features can be associated with each line position if the line speed does not exceed 9600 bps. **Maximum:** Eight. **Field Installation:** Yes. **Limitations:** If feature #5650 is installed with a speed of 56,000 bps (#9444), then: (1) High Speed Modem Adapter (#4720) cannot be installed ... (2) 231X DASD attached to the Block Multiplexer Channel (#1421) cannot be installed ... (3) 3370 DASD attached (#9201) to the DASD Adapter (#3201) cannot be installed. **Specify:** #9444¹ for operation at 56,000 bps ... SDLC and/or BSC operations are possible ... see Table 4 for Line Position Code, Transmission Mode Code, and line speed selection codes. **Prerequisites:** Communications Adapter, Base (#1601), and Line Attachment Base for Clocked Modems (#4695). **Cable Order:** Required for attachment to external equipment.

¹ System Diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on the same diskette.

² Feature supplies diskette for System Diskette facility.



TABLE 4

COMMUNICATIONS ADAPTER CONFIGURATION FEATURE AND POSITION CODES

	Fea- ture # 1	Req'd Line Attach Base # 2	Line Position with Line Position Codes								
			1 ¹	2 ¹	3 ¹	4 ¹	5 ¹	6 ¹	7 ¹	8 ¹	
EIA/CCITT Inter- face (for Clock Mod- ems) (6)	3701	4695	9531	9532	9533	9534	9535	9536	9537	9538	
EIA/CCITT Inter- face (for non- clocked Mo- ems) (6)	3701	4696	9521	9522	9523	9524	9525	9526	9527	9528	
High Speed Mod- em Adapter (7)	4720	4695	9501								
1200 bps Inte- grated Modems:											
Nonswitched with Switched Network Backup and Auto Ans	4788	4696	9641	9642	9643	9644	9645	9646	9647	9648	
Nonswitched with Switched Network Backup and Manual Ans	4787	4696	9631	9632	9633	9634	9635	9636	9637	9638	
Switched with Auto Ans	4782	4696	9651	9652	9653	9654	9655	9656	9657	9658	
Nonswitched	4781	4696	9661	9662	9663	9664	9665	9666	9667	9668	
Digital Data Service Adptr - for 2400, 4800, 9600 bps for 56,000 bps (7) (8)	5650	4695		9471	9472	9473	9474	9475	9476	9477	9478
			9444								
Local Attach Inter- face	4801	4695	9451	9452	9453	9454	9455	9456	9457	9458	
Autocall Unit Interface (3)	1020										
First			9541	9542	9543	9544	9545	9546	9547	9548	
Second			9551	9552	9553	9554	9555	9556	9557	9558	
Transmission Mode (5)											
BSC (1)			9671	9672	9673	9674	9675	9676	9677	9678	
Start/Stop (2)			9681	9682	9683	9684	9685	9686	9687	9688	
SDLC (1)			9691	9692	9693	9694	9695	9696	9697	9698	

NOTES:

- (1) BSC or SDLC transmission mode with any line attachment feature.
- (2) Start/Stop transmission mode only with EIA/CCITT Interface (for nonclocked modem, #3701 and prerequisite #4696) or with any other features offering 1200 bps Integrated Modems (with prerequisite #4696).
- (3) Must be associated with EIA/CCITT Interface (#3701 and prerequisite #4695 or #4696). Maximum of two features (#1020) may be installed.
- (5) Only two Transmission Modes may be installed on a system. The aggregate data rate of the Communications Adapter is 64,000 bps. Line features exceeding this aggregate may be installed, but not operated concurrently. To allow the aggregate of 64,000 bps to be achieved, the highest speed line must be installed in line position one, the next highest in line position two, etc. Each transmission mode installed has different requirements for microcode storage ... see Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901).
- (7) May not be installed when 231X DASD is attached to the Block Multiplexer Channel (#1421), or when 3370 DASD is attached (#9201) to the DASD Adapter (#3201).
- (8) When changing #9444 to/from #9471, no new hardware or diskette is required.

Special Feature Prices:	MRC	MLC 2 yr	Purch	MMMC/ AMMCR	
Adapter Power Prereq	#1001	\$ 71	\$ 60	\$2,400	\$ 7.00
Adapter Logic Prereq	1002	129	110	4,400	12.00
Blk Multiplexer Channel	1421	129	110	4,400	1.50
Control Store Expansion	1901	150	128	5,100	34.50
Display/Printer					
Adapter Expansion	2001 ²	32	27	1,215	1.50
DASD Adapter	3201 ²	106	90	3,600	3.50
Diskette Drive	3401	103	88	3,520	18.50
External Signals	3898	9	8	300	.50
5424 Adapter	3901 ²	194	165	6,600	8.50
1401/1440/1460 Compat	3950 ³	N/C	N/C	N/C	N/C
8809 Mag Tape Unit Adptr	4910 ²	106	90	3,600	3.50
Byte Multiplexer Channel	5248	103	88	3,520	1.50
Power Interface	5531	65	55	2,200	1.00
Power Interface, Add'l	5532	33	28	1,100	1.00
Printer-Keyboard Mode	5550 ³	N/C	N/C	N/C	N/C
System/3 Data Import	6305 ³	N/C	N/C	N/C	N/C
3340 Direct Attachment	7851 ³	N/C	N/C	N/C	N/C
2311/2314/2319/3310 Direct					
Access Storage Compat	7901 ³	N/C	N/C	N/C	N/C
ECPS:VM/370	8701 ³	N/C	N/C	N/C	N/C
Communications					
Autocall Unit Interface	1020 ²	13	11	440	2.00
Comm Adapter, Base	1601 ²	90	77	3,080	1.50
EIA/CCITT Interface	3701 ²	13	11	440	2.00
Line Attach Base					
for Clocked Modems	4695 ²	13	11	440	.50
for Nonclocked Modems	4696 ²	15	13	520	.50
Hi Speed Modem Adapter	4720 ²	35	30	1,320	2.00
1200 bps Integrated Modem					
Non-Switched	4781 ²	19	16	668	3.50
Switched w Auto Ans	4782 ²	25	21	860	3.50
Non-Switch w Switch Network					
Backup and Manual Ans	4787 ²	26	22	910	3.50
Non-Switch w Switch Network					
Backup and Auto Ans	4788 ²	29	25	1,015	4.00
Local Attachment Interface	4801 ²	29	25	1,100	3.00
Dgtl Data Service Adapter	5650 ²	24	20	840	2.50

ACCESSORIES: The following items are available on a purchase only basis. For shipment with the 4331, order the feature number indicated below at the price listed in the M10000 pages. See the M10000 pages for additional information and field installation.

CONSOLE TABLE, 4300 PROCESSORS (#1550). Provides a convenient work station table to support one or two 3278 mdl 2As. Specify: Color -- #9161 for willow green, #9162 for garnet rose, #9163 for sunrise yellow, #9164 for classic blue, #9165 for charcoal brown, or #9166 for pebble gray.

BOOK RACK AND CABLE HOLDER (#1480).

[reverse side is blank]

¹ System Diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchased machines to include any number of diskette-only changes ordered on the same diskette.

² Feature supplies diskette for System Diskette facility.

³ System Diskette-only special feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. \$405 on purchase machines to include any number of diskette-only changes ordered on the same diskette.



IBM 4341 PROCESSOR

Purpose: Provides power, control, logic, and memory circuitry for the arithmetic, logic and processor storage functions of the 4341 Processor.

Model	Bytes of Processor Storage
K1	2,097,152
L1	4,194,304

Note: The microcode which controls system operations resides in Reloadable Control Storage and keeps dynamic tables in Processor Storage, thus reducing the amount of Processor Storage available for user programming. Storage available to the user is reduced by a minimum of 14K bytes up to a maximum of 108K bytes, depending on the processor configuration. See "Microcode Storage Requirements" below for details.

Highlights: Depending upon the model, has 2,097,152 bytes or 4,194,304 bytes of monolithic processor storage ... 150 to 300 nanosecond processor cycle ... eight byte parallel data flow within the processor as well as an eight byte wide data flow between the processor, the storage and the channels ... includes 8,192 bytes of buffer storage which is transparent to the program and significantly reduces the effective access time of storage ... buffer storage does not increase the amount of addressable storage ... balanced performance of decimal, commercial, and scientific instructions ... extensive data checking, error recording by the hardware system itself, and remote maintenance are coupled with increased availability and serviceability.

Standard Features: Include the following: Virtual Storage Capability by Dynamic Address Translation ... one Byte and two Block Multiplexer Channels ... one Level Addressing Facility for improved virtual storage control by DOS/VSE (ECPS:VSE Mode) ... Channels with Virtual Storage Addressing (ECPS:VSE Mode) ... Channel Indirect Addressing in S/370 Mode ... Channel Command Retry ... 128 to 1024 UCWs ... EC and BC Modes ... Byte Oriented Operands ... Clock Comparator and CPU Timer ... Control Registers ... Error Checking and Correction in Processor Storage ... Extended Control-Program Support ... Extended Precision Floating Point ... Interval Timer ... Machine Check Handling ... Support Processor ... Instruction Retry ... Program Event Recording ... Reloadable Control Storage ... Storage Protection (Store and Fetch) ... S/370 Universal Instruction Set ... System Diskette Drive ... Time of Day Clock ... PSW Key Handling ... Compare and Swap and Compare Double and Swap ... Clear I/O ... External Signal ... Unit Power-off ... Move Inverse Instruction (not software supported).

Modes of Operation: Two modes of operation are available. The mode is selected from a common diskette at Initial Microcode Load (IML) time.

ECPS:VSE Mode -- allows operation of an appropriately generated DOS/VSE system, offering enhanced systems performance.

System/370 Mode -- allows operation of any program written for S/370 and S/360 that does not violate the exceptions noted under "Compatibility" below. See the Programming Support Section for those SCPs which contain 4341 support. In this mode, two performance options are available. These options are selected at IML time and are mutually exclusive.

ECPS:VS1 - hardware assist that reduces the CPU time needed to execute certain frequently used supervisor functions in OS/VS1 Release 7. The functional areas assisted include:

- IOS
- SVC FLIH
- System Trace
- Page Management

ECPS:VM/370 - hardware assist that reduces the CPU time needed to execute certain frequently used supervisor functions in VM/370 Release 6. The functional areas assisted include:

- Virtual Machine I/O
- Storage Management
- SVC Handler
- Privileged Instruction Emulation
- Dispatching
- Virtual Interval Timer

The 4341 Processor provides ECPS:VM/370 Support at Level 19. This support is compatible with VM/370 Release 6 and the corresponding levels of the systems extension program products. This level is also compatible with the VM/370 Release 5 PLC that provides 4341 support.

System Diskette Drive: This is the basic microcode loading device for the system. The several removable diskettes that will be supplied with the system will contain all of the required microcode

for FE diagnostics, basic systems features, plus the optional features ordered for the system. The System Diskette File also allows recording of system failure data for later CE diagnostics.

Console Function: A 3278 Display Console model 2A equipped with an operator keyboard with an operator control panel is required. It is the principal device provided for the operator to communicate with the system. The operator may use the keyboard and the display to control the system operation as well as to display the status of the system. The primary operator console keyboard includes the operator control panel. The 3278 model 2A has a screen size of 1920 characters, 24 lines at 80 characters per line. The bottom four lines (lines 21-24) are reserved for system status information and are not accessible to the user. 3278 features other than those basic to the primary console display/keyboard are not supported. Up to three optional (for a total of four) 3278 Display Console mdl 2As or 3287 Printer mdl 1s or 2s for hard copy output are also available in any combination.

Two console modes are available -- Display Mode and Printer-Keyboard Mode.

In *Display Mode*, the keyboard is used for input, the display with 20 lines of 80 characters/line for output, and DOS/VSE, DOS/VS Release 34, OS/VS1 Release 7 or VM/370 Release 6 support is required. The optional 3287 Printer mdl 1 or 2 has a separate address.

In *Printer-Keyboard Mode*, the 3278 Display Console mdl 2A uses the keyboard for input and the display and a recommended 3287 Printer mdl 1 or 2 for output. The display/keyboard and 3287 Printer appear to the system as a Console Printer-Keyboard. This allows the 4341 Processor user to run an operating system which has been generated for use on a S/360 with a 1052 Printer-Keyboard or a S/370 with a 3210 or 3215 Console Printer-Keyboard.

Channels: Six channels in two groups are available. The standard group consists of 1 byte multiplexer channel and 2 block multiplexer channels with a block transfer rate of up to 2.0 million bytes per second for each channel. The second group, available as a special feature, consists of 3 block multiplexer channels. Single channel block transfer rate of up to 2.0 million bytes per second is available on each of two of the three optional channels and 1.0 million bytes per second on the other.

The aggregate data rate of the two standard block multiplexer channels is 4 megabytes/second. The aggregate data rate of the five block multiplexer channels including the optional group is 9 megabytes/second.

The capability for the attachment and automatic I/O power sequencing of up to 24 separate control units is standard. Optionally, 48 control units can be accommodated ... see "Special Features."

An optional channel-to-channel adapter is also available ... see "Special Features."

Compatibility: Any program written for S/370 will operate on the 4341 in S/370 Mode, provided that it (1) is not time-dependent, (2) does not depend on system facilities (storage size, I/O equipment, optional features, etc.) being present when the facilities are not included in the configuration, (3) does not depend on system facilities (interruptions, operation codes, etc.) being absent when the facilities are included in the 4341, and (4) does not depend on results or functions which are defined in the Principles of Operation to be unpredictable or model-dependent.

Any program written for S/360 will operate on the 4341 Processor in S/370 mode, provided that it follows the above rules and does not depend on functions that differ between S/360 and S/370.

Any program written for the 4331 Processor in ECPS:VSE Mode or S/370 Mode will operate on a 4341 Processor, provided that it follows the above rules.

For more details, see *S/370 Principles of Operation, GA22-7000*, or *4300 Processors Principles of Operations for ECPS:VSE Mode, GA22-7070*.

Microcode Storage Requirements: The microcode which controls system operations resides in Reloadable Control Storage and keeps dynamic tables in Processor Storage, thus reducing the amount of Processor Storage available for user programming. The amount required is the sum of Processor Storage required by two user selectable options: 1) The number of Unit Control Words (UCWs) selected, and 2) the mode of operation.

1. 128 UCWs are basic on the 4341 and require 8,192 bytes of Processor Storage. Additional UCWs are allocated as required in groups of 32, each group requiring an additional 2,048 bytes of Processor Storage. The maximum number of UCWs on the 4341 is 1024.

UCW assignment is user dependent. It is the customer's responsibility to designate desired I/O addresses and configurations to service personnel. Channel configurations should be



4341 Processor (cont'd)

reviewed during pre-installation planning for new systems and when additional I/O devices are attached or existing equipment is reconfigured.

For specific device requirements, see 4300 Processors in "Systems."

2. Depending on which mode of operation is selected at IML time, processor storage will be required as follows:

Bytes of Processor Storage Required

Mode of Operation	Model K1	Model L1
ECPS:VSE Mode	43,008	45,056
System/370 Mode	6,144	6,144

Prerequisite: Each 4341 Processor requires one 3278 Display Console model 2A equipped with a keyboard with an operator control panel ... see "Special Features" under 3278 mdl 2A.

Minimum Configuration: See Minimum Configurations under 4300 Processors in "Systems."

Bibliography: To be announced.

SPECIFY

- **Voltage (AC, 3-phase, 4-wire, 60 Hz):** #9903 for 208 V, or #9915 for 240 V.
- **Shipping Instructions:** Unless otherwise specified, shipping dimensions of the 4341 are 62-3/4" x 32" x 39-1/2". If a reduction in dimensions is required, specify #9570. Shipping dimensions will then be 60" x 29-1/2" x 38-1/2".
- **Cabling:** See 3278 mdl 2A for console cabling.
- **Color:** #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray. **Note:** #9061, #9062 and #9063 are slightly different colors from those available on previous machines.
- **Minimum System:** See "Minimum Configurations" under 4341 in "Systems" for minimum I/O units required for the 4341 Processor.
- **Remote Support Facility:** The Remote Support Facility (RSF) is a customer option. It is recommended to enhance the hardware maintenance of the 4341 Processor. It provides service personnel the capability of remotely controlling the 4341 from any RETAIN terminal and allows the IBM CE to access the RETAIN Data Bank for the latest service aids and information from the customer site. When this option is selected, the customer must provide the telephone lines required for the RSF modem. The customer must also arrange for the connection of the telephone interface cable provided by IBM to the telephone network. For details on customer responsibilities, see 4300 Processors *Installation Manual - Physical Planning, GA24-3667*.

If RSF is desired, specify #9510.

- **System Environment:** For record purposes specify one of the following codes (reference only, no parts required):
 - #9701 -- This processor is planned to be host/peer connected to a system within the same branch office territory (at installation or at a future time).
 - #9702 -- This processor is planned to be host/peer connected to a system in a different branch office territory (at installation or at a future time).
 - #9703 -- This processor is planned to be a standalone (no host/peer connect).

Prices:	Mdl	MRC	MLC 2 Yr	Purchase	MMMC/ AMMCR
4341	K1	\$7,021	5,975	\$245,000	\$475
	L1	7,902	6,725	275,000	515

Plan Offering: Plan D Warranty: A Machine Group: D
 Useful Life Category: 2 Per Call: 3
 Purchase Option: 60% Upper Limit Percent: 5%
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Initial Period of Maintenance Service Availability: 3 mos.

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICE (There are no additional installation charges)

Model K1 to Model L1 ... \$30,000

SPECIAL FEATURES

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (4341 Processor, S/360, S/370). Only one of the processors requires this feature. Requires one control unit position on each of the connected channels. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** 75 Key Operator Console Keyboard with Channel-to-Channel (#4631) on the primary 3278 Display Console mdl 2A ... a control unit position on a block multiplexer channel.

BLOCK MULTIPLEXER CHANNELS, ADD'L (#1870). An optional group of three block multiplexer channels ... permits simultaneous operation of high speed devices at a data rate of 2.0 MB/second for two channels and 1.0 MB/second for one channel. **Maximum:** One. **Field Installation:** Yes.

CHANNEL CONTROL UNIT POSITIONS, ADD'L (#1890). This feature is required for the automatic I/O power sequencing of more than 24 control units from the 4341. Standard on the 4341 is the capability to attach and automatically power up 24 control units, not to exceed eight per channel. With this feature, 25 to 48 control units, not to exceed 8 per channel, may be attached and automatically powered up. **Maximum:** One. **Prerequisite:** Block Multiplexer channels, Add'l (#1870). **Field Installation:** Yes.

Special Feature Prices:	MRC	MLC 2 Yr	MMMC/ Purchase AMMCR
Chnl-to-chnl Adapter #1850	\$617	\$525	\$21,000 \$23.50
Block Multiplexer Channels, Add'l	1870	475 404	16,150 5.00
Channel Control Unit Positions, Add'l	1890	74 63	2,500 8.50

ACCESSORIES: The following items are available on a purchase only basis. For shipment with the 4341, order the feature number indicated below at the price listed in M 10000 pages. See the M 10000 pages for additional information and field installation.

Console Table, 4300 Processors (#1550). Provides a convenient work station table to support one or two 3278 mdl 2As. **Specify:** Color ... #9161 for willow green, #9162 for garnet rose, #9163 for sunrise yellow, #9164 for classic blue, #9165 for charcoal brown, or #9166 for pebble gray.

Book Rack and Cable Holder, 4300 Processors (#1480).



IBM 5010 PROCESSOR MODULE

Purpose: Provides the arithmetic, logic and control functions for System/7.

Models:	Storage (words)	Stand-Alone Models	1130 Attach Models
	2,048	A2	B2
	4,096	A4	B4
	6,144	A6	B6
	8,192	A8	B8
	10,240	*A10	*B10
	12,288	*A12	*B12
	14,336	*A14	*B14
	16,384	*A16	*B16
	16,384	E16	
	20,480	E20	
	24,576	E24	
	28,672	E28	
	32,768	E32	
	36,864	E36	
	40,960	E40	
	45,056	E44	
	49,152	E48	
	53,248	E52	
	57,344	E56	
	61,440	E60	
	65,536	E64	

* Requires #7401 in 5026.

Highlights: Uses binary arithmetic, fixed word length of 16 data bits plus 2 parity bits. Storage cycle time is 400 nanoseconds. Instructions are one or two words in length with full storage addressing.

Standard features include 64 priority interrupts, including 4 interrupt levels with 16 sublevels, 7 index registers, one accumulator, and one instruction address register per interrupt level, two interval timers, and an interface for the 5028 Operator Station.

The 5010 Processor Module includes a **READ ONLY** Tape Cassette Recorder attachment and associated connection cable (P/N 2703633). The attachment provides the capability to IPL and program load either FE Diagnostic Programs or the Disk Support System (DSS/7) (5707-SC2) from a tape cassette recorder (Norelco Model 1420 or equivalent). See Customer Responsibilities for System/7 in the "Systems" section.

The A and E models have an Asynchronous or Binary Synchronous Communications Adapter as an optional feature. This circuitry provides the capability for initial program load of the System/7 from a remote system with no resident program in the System/7. The B models have an interface for connection to an 1130 System as a standard feature.

PREREQUISITES: The first module location in the 5026 Enclosure mdl A2, C3 or C6. A and B models with more than 8K of storage require Storage Power Addition (#7401) in the 5026 Enclosure ... see 5026. #7401 is not required for E models. For E models replacing installed A or B models, or vice versa, an MES (lease) or RPQ (purchase) must be ordered for the proper 5026 Power Specify Code ... see 5026. The B models require a Storage Access Channel (#7490) on the 1131 or a Storage Access Channel II (#7492) on an 1133. **Limitation:** Program preparation on configurations with 2K storage are not supported by IBM supplied programming.

Customer Responsibilities: See System/7 in "Systems."

System/7 Summary: GA34-0002

Specify: [1] For the location of the Modules in the system, specify one of the following:

#9141 -- location of all I/O Modules to be determined at the plant. (Specify Code #9143 in I/O Modules cannot be used.)

#9142 -- location of all I/O Modules are specified by the customer. Specify Code #9143 must be used in each I/O Module order.

#9144 -- for shipment without mounting in an enclosure.

[2] System Control Programs must be ordered prior to Order Confirmation (OC) Time.

[3] Cables: Use cable order form number Z120-2368.

[4] For identification of major application, specify #9XXX on all models. See Special Features for identifier code. No charge feature.

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
5010	A2	\$ 237	\$ 5,310	\$ 49.00
	A4	375	7,595	61.00
	A6	511	9,865	73.00
	A8	649	12,190	84.50
	A10	785	14,460	96.50
	A12	920	16,780	108.00
	A14	1,055	19,050	120.00
	A16	1,185	21,370	132.00
	B2	367	7,780	58.00
	B4	504	10,050	70.00
	B6	640	12,380	81.00
	B8	779	14,640	92.50
	B10	914	16,970	104.00
	B12	1,050	19,230	117.00
	B14	1,180	21,560	129.00
	B16	1,310	23,820	140.00
	E16	1,200	22,580	242.00
	E20	1,385	25,710	275.00
	E24	1,550	28,770	306.00
	E28	1,720	31,830	339.00
	E32	1,905	34,890	371.00
	E36	2,080	37,950	404.00
	E40	2,245	41,070	437.00
	E44	2,430	44,130	468.00
	E48	2,605	47,190	501.00
	E52	2,785	50,250	533.00
	E56	2,960	53,310	566.00
	E60	3,130	56,430	599.00
	E64	3,305	59,490	631.00

Plan Offering: Plan B Warranty: A Maintenance: A
Purchase Option: 60% Useful Life Category: 2 Per Call: 2

Model Changes: Changes within A mdls, B mdls or E mdls are field installable. **REPLACEMENT** of A or B mdls with E mdls requires a 5026 to remove code #7401 or #9490 on both and add code #9491 (see 5026). **CHANGE** from A or B mdl to E mdl (and vice versa) within a 5010 cannot be field installed. Changes from A mdl to B mdl (and vice versa) are not recommended for field installation.

STORAGE UPGRADE PURCHASE PRICES: Upgrade price equals the difference in purchase price between the two models. There are no additional installation charges.

SPECIAL FEATURES

CYCLE STEAL BASIC (#2662). Provides a path between 5010 main storage for the 5022 Disk Storage Module, equipped with companion cycle steal attachment, Disk Cycle Steal (#2664). **Maximum:** One per 5010. **Field Installation:** Yes. **Prerequisite:** Model A4 or larger, Model B4 or larger, or Model E16 or larger. Required for 5998-T01, 3340 Attachment.

5024 ATTACHMENT FEATURE (#4115). [Mdl E only] Provides a path between 5010 mdl E main storage for the 5024 I/O Attachment to Enclosure. **Maximum:** One per 5010 mdl E. **Field Installation:** Yes. **Limitation:** Cannot be installed with IBM 1200 bps Integrated Modem (#5500 or #5501) or with System 360/370 Channel Attach (RPQ). Other 5010 mdl E RPQs must be submitted for review.

ASYNCHRONOUS COMMUNICATIONS CONTROL (#1610). [Mdls A and E only] Provides control circuits for one asynchronous communications line adapter. #1610 is used for communications with S/360 and S/370 (via 2701, 2702, 2703, 3704 or 3705), or for communications with 4300 Processors (via a 2701, 3704, or 3705 to all 4300 Processors, or via the Communications Adapter feature on the 4331) ... see 2701, 3704/3705, 4331 and 4341 in "Machines" for details and prerequisites. **Note:** See 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.) S/370 mdl 115, 125, 135, 135-3 and 138 with Integrated Communications Adapter (#4640), and with the 1800 System (via RPQ C08763). Data transmission is serial by bit using start/stop method of character and bit synchronization. The IBM PTTC/EBCD code is used. Point-to-point or multidrop transmission at speeds of 134.5 or 600 bps (14.8 or 66.7 characters per second) are available. Speed changes can be made in the field. Line control characters are identical to 2740 mdl 1. Line control characters are used in a manner similar to 2740 mdl 1, with error checking. See IBM System/7 Functional Characteristics, GA34-0003, for exact description of use. Communication Control provides the capability to load a program from the communication network into System/7 with no resident program in System/7 (remote IPL). For information on communications facilities, see M 2700 pages. **Maximum:** One #1610 per system. **Limitation:** Cannot be installed with Binary Synchronous Communications Adapter (#2074). **Field Installation:** Yes.

COMMON CARRIER ADAPTER (#2165). [Mdls A and E only]



5010 Processor Module (cont'd)

Provides interface to an external modem meeting EIA standard RS-232-C. The interface lines provided are Transmitted Data, Received Data, Request to Send, Clear to Send, Data Set Ready, Data Terminal Ready, Signal Ground and Protective Ground. **Limitation:** Cannot be used with Line Adapter (#4750, 4751 or 4752). **Maximum:** One per #1610. **Field Installation:** Yes. **Prerequisite:** Asynchronous Communications Control (#1610).

LINE ADAPTER, LEASED LINE TYPE 1A (#4751). [Mdl's A and E only] A leased line type 1A modem for 2-wire unlimited distance use at speeds of 134.5 or 600 bps. Only point-to-point communications facilities can be used. See Line Adapter Leased Line Type 1A in SRL GA24-3435 for specifications and requirements. **Limitation:** Cannot be used with Line Adapters (#4750 or #4752) or Common Carrier Adapter (#2165). **Maximum:** One per #1610. **Field Installation:** Yes. **Prerequisite:** Asynchronous Communications Control (#1610).

LINE ADAPTER, LEASED LINE TYPE 1B (#4752). [Mdl's A and E only] A leased line type 1B modem for 4-wire unlimited distance use at speeds of 134.5 or 600 bps. Point-to-point or multipoint communications facilities can be used. See Line Adapter Leased Line Type 1B in SRL GA24-3435 for specifications and requirements. **Limitation:** Cannot be used with Line Adapters (#4750 or #4751) or Common Carrier Adapter (#2165). **Maximum:** One per #1610. **Field Installation:** Yes. **Prerequisite:** Asynchronous Communications Control (#1610).

LINE ADAPTER, LIMITED DISTANCE TYPE 2B (#4750). [Mdl's A and E only] A limited distance type 2B modem for 2-wire use up to 8.25 wire-miles at speeds of 134.5 or 600 bps. Point-to-point or multipoint communications facilities can be used. See Line Adapter Limited Distance Type 2B in SRL GA24-3435 for specifications and requirements. **Limitation:** Cannot be used with Line Adapters (#4751 or #4752) or Common Carrier Adapter (#2165). **Maximum:** One per #1610. **Field Installation:** Yes. **Prerequisite:** Asynchronous Communications Control (#1610).

† **BINARY SYNCHRONOUS COMMUNICATIONS CONTROL (BSCA) (#2074).** [Mdl's A and E only] Provides circuitry for one binary synchronous communications adapter. This feature is used for communications with S/370, a Communications Adapter on a 4331 Processor, another System/7 with BSCA (#2704), a System/3 mdl 6, 8, 10, 12 or 15 with BSCA, a System/32 with BSCA (#2074) (switched or non-switched point-to-point only), a System/34 with Communications Adapter (switched or non-switched point-to-point only), a System/3 mdl 8, 10, 12 or 15 with BSCA and EIA Local Attachment (#3601, 3602), a System/3 mdl 6, 10 or 15 with Local Communications Adapter (LCA) (#4765), a System/3 mdl 8 or 12 with Integrated Communications Adapter (ICA) (#4645) or ICA-Local Interface, or a System/3 mdl 8 with ICA or BSCA. Data transmission is half duplex over 2- or 4-wire circuits using binary synchronous line control. Data transfer on point-to-point (switched or non-switched) and multipoint configurations is supported. In multipoint configurations, System/7 operates as a tributary station. On point-to-point networks System/7 functions as a processor terminal. Transmission codes supported are EBCDIC and ASCII, software controlled. Transparent mode is standard in the BSCA, but allowed only in EBCDIC. Control circuitry provides the capability for IPL of the System/7 from a remote system. IPL can be accomplished on point-to-point switched and multipoint configurations and requires the use of transparent EBCDIC transmission code.

Local Attachment to System/3 -- Point-to-point Non-Switched Communication is also provided with the System/3 BSCA-EIA-LOCAL, LCA, or ICA-LOCAL.

SYSTEM/3 Model	LCA (#4765) Speed (bps)	BSCA-EIA-LOCAL (#3601, 3602) Speed (bps)	ICA (#4645) Speed (bps)
6	2400	N/A	N/A
8	N/A	2400, 4800, 8000	2400, 8000
10	2400	2400, 4800, 8000	N/A
12	N/A	2400, 4800, 8000	2400, 8000
15	2400	2400, 4800, 8000	N/A

For local attachment to a System/3 BSCA-EIA-LOCAL, ICA-LOCAL, or LCA, an appropriate cable order is required. Installation Manual - Physical Planning, GA34-0004, includes cable description and ordering information.

Limitations: Cannot be installed with Asynchronous Communications Control (#1610); support as a multipoint central system is not provided. **Maximum:** One #2074 per system. **Field Installation:** Yes. **Prerequisite:** 5010 mdl A6 or larger or mdl E16 or larger.

INTERNAL CLOCK (#4703). [Mdl's A and E only] Provides BSCA clocking when modems do not provide clock pulses. Speed options are 1200, 2000 and 2400 bps which are hardware selectable. **Maximum:** One per #2074. **Limitation:** Not available with Line Interface Type 1G (#4805). Do not use if System/7 is to interface to a System/3 mdl 8, 10, 12 or 15 BSCA-EIA-LOCAL Attachment (#3601, 3602) or a System/3 mdl 6, 10 or 15 Local

Communications Adapter (LCA) (#4765), or a System/3 mdl 8 or 12 Integrated Communications Adapter (ICA) (#4645). **Field Installation:** Yes. **Prerequisite:** BSCA (#2074).

LINE INTERFACE TYPE 1D (#4800). [Mdl's A and E only] Provides a low and medium speed interface to permit operation with external modems that comply with the EIA RS-232-C standard and with System/3 mdl 8, 10, 12, 15 with BSCA and EIA Local Attachment (#3601, 3602), or a System/3 mdl 6, 10 or 15 with Local Communications Adapter (LCA) (#4765), or System/3 mdl 8 or 12 with Integrated Communications Adapter (ICA) (#4645). Modems of this type operate on switched or non-switched facilities up to 2400 bps and over non-switched facilities at up to 7200 bps. Auto-answer capability is supported. **Maximum:** One per #2074. **Limitations:** Cannot be installed with Line Interface Type 1G (#4805) or IBM 1200 BPS Integrated Modem (#5500, 5501). **Field Installation:** Yes. **Prerequisite:** BSCA (#2074).

LINE INTERFACE TYPE 1G (#4805). [Mdl's A and E operating up to 50.0K bps max.] Provides a high speed interface for stand-alone modems operating on a wide band interface. Modems of this type operate at speeds of 10,000 bps and higher only on non-switched lines. **Maximum:** One per #2074. **Limitations:** Cannot be installed with #4800, #5500, #5501; Internal Clock (#4703) is not available with this feature; Will not interface to S/370 mdl 135, 135-3 or 138 Integrated Communications Adapter (#4640), or Communications Adapter feature on a 4331. **Field Installation:** Yes. **Prerequisite:** BSCA (#2074).

IBM 1200 BPS INTEGRATED MODEM, LEASED (#5500). [Mdl's A and E only] Provides one IBM 1200 bps Integrated Modem which is suitable for communications over facility D3 with another IBM 1200 bps Integrated Modem. **Maximum:** One per #2074. **Limitations:** Cannot be installed with #4115, #4800, #4805 or #5501; Will not interface to S/370 mdl 135 Integrated Communications Adapter (#4640). **Field Installation:** Yes. **Prerequisites:** BSCA (#2074); Internal Clock (#4703). For local attachment to System/3-BSCA-EIA-Local, ICA-Local, or LCA, an appropriate cable order is required. Installation Manual - Physical Planning, GA34-0004, will be updated to include cable description and order information.

IBM 1200 BPS INTEGRATED MODEM, SWITCHED (#5501). [Mdl's A and E only] Provides one IBM 1200 bps Integrated Modem which is suitable for communications over facility C4 with another IBM 1200 bps Integrated Modem. This adapter includes the automatic answer capability. **Maximum:** One per #2074. **Limitations:** Cannot be installed with #4115, #4800, #4805 or #5500; Will not interface to S/370 mdl 135 Integrated Communications Adapter (#4640). **Field Installation:** Yes. **Prerequisites:** BSCA (#2074); Internal Clock (#4703).

BSCA COMMUNICATIONS FACILITIES

Speed (bps)	Facilities	BSCA Features
1200	C4, D5	4800, 5500, 5501, 4703
2000	C5, D6	4800, 4703
2400	C5, D7	4800, 4703
4800	C8, D8	4800
7200	D9	4800
19.2K	E1	4805
40.8K	E2	4805
50.0K	E3	4805

IBM modems which may be attached to the BSCA are the 3872, 3874, 3875. The IBM 1200 bps Integrated Modem is available as feature #5500 or #5501.

Special Feature Prices:	MAC/MRC	Purchase	MMMC
Cycle Steal Basic	#2662	\$ 55	\$1,170 \$ 3.00
5024 Attach Feature	4115	34	844 4.50
Async Commn Control	1610	96	1,955 13.50
Common Carrier Adapter	2165	10	261 2.50
Line Adapter,			
Leased Line Type 1A	4751	31	651 14.50
Leased Line Type 1B	4752	31	651 14.50
Limited Dist Type 2B	4750	31	651 14.50
Binary Sync Comm Adapter	2074†	232	4,685 58.00
Internal Clock	4703	24	522 2.50
Line Interface Type 1D	4800	31	651 2.50
Line Interface Type 1G	4805	63	1,305 .50
IBM 1200 bps Integrated Modem,			
Leased	5500	16	456 2.50
Switched	5501	24	608 3.00

† No Educational Allowance.



DP Machines

M 5010.3
May 79

5010 Processor Module (cont'd)
SYSTEM/7 APPLICATION IDENTIFIER CODES

Specify Feature Codes have been added to the 5010 Processor Unit. These are no-charge features which identify the major application on the system.

SPECIAL FEATURE ...

Processing Unit -- major applications on order in the account. Identifier (#9XXX) (All models).

Code#	Feature (Application)	Code#	Feature (Application)
9001	Data Collection	9009	Lab. Applications
9002	Telephone Data Entry	9010	Stand-alone Scientific
9003	Power Management	9011	Maritime
9004	Message Switching	9012	TTS/TB
9005	Other TP Applications	9013	CAMA
9006	CAS	9014	ACLR
9007	Testing/Monitoring	9015	ACDMS
9008	Process Control		

Limitations: Only one feature code per 5010 can be specified.

5012 MULTIFUNCTION MODULE

Purpose: To provide digital input/output, analog input/output, and 2790 control on System/7.

Highlights: Provides capability for:

- Attachment of a 2790 Control.
- Up to 128 digital input points.
- Up to 32 isolated process interrupt points.
- Up to 64 digital output points.
- Up to 32 differential analog input points.
- Up to 2 isolated analog output points.

2790 Control: Provides the required logical interface for attachment of 2790 Data Communication devices to System/7. This allows System/7 to act as the "system controller" for 2791/2793 Area Stations or 2792 Remote Communication Controller. The 2790 Control allows transmission of data between System/7 and the 2791/2793 Area Stations (and 2795/2796/2797 Data Entry Units, and 2798 Guidance Display Units). Transmission rate is approximately 500,000 bits per second (900 characters per second). See 2790 in "Systems." The combined number of 2791/2793s and 2792 mdl 1s on each 5012 or 5013 may not exceed 16. **Maximum:** Four 2790 Controls per system, one per 5012 Multifunction Module.

Digital Input -- provides up to 8 groups of 16 digital input points. Either isolated or non-isolated Digital Input groups are available. Each digital input point is a voltage or contact sense, 2-terminal circuit. Each group can be program controlled for latching or non-latching operation. Any one of the eight groups may be read under direct program control. The first two groups of digital inputs may be converted to process interrupt points through the addition of the Process Interrupt feature.

Process Interrupt -- an "interrupt on change" feature is offered on the first two groups of digital inputs. This feature provides the capability to compare the input of 16 bit groups against a program loadable 16 bit register and initiate an interrupt on either an equal or unequal comparison.

Digital Output -- provides up to four groups of 16 digital output points. Each digital output point may be set or reset under program control. Each Digital Output group may be one of the following circuit types: Low Power, Medium Power, Medium Power Non-Isolated, or Contact Output. Low Power output provides switching with a maximum rating of 6 volts at 4 milliamps. Medium Power and Medium Power Non-Isolated operate up to 48 volts at 450 milliamps. Contact Output provides a Form A mercury wetted relay contact rated at 125 V dc max or 88 V ac RMS max, 2A ac RMS max; the product of peak voltage and peak current must not exceed 100 (100 VA max). Digital outputs operate under direct program control. Medium Power and Contact Output points are isolated and may be directly connected to the standard Digital Input points. This provides the capability for wrap-around testing and multiplexing of digital and analog inputs with digital output points.

Analog Input -- provides up to eight groups of 8 differential analog input points. A multiplexer connects each point to an analog-to-digital converter which is capable of converting voltage signals, in the range of ± 10 millivolts to ± 5.12 volts full scale, into binary values of 14 bits plus sign. Either an amplifier with a unit gain or an automatic multirange amplifier must be selected. The unity gain or high level amplifier provides a full scale range of ± 5.12 volts. The multirange amplifier provides full scale ranges of ± 10 mv, ± 20 mv, ± 40 mv, ± 80 mv, ± 160 mv, ± 640 mv, and ± 5.12 volts. Analog input is under direct program control. Immediate and External Synchronization operations are both available. Two analog scan rates are provided: #5246 uses a mercury wetted relay multiplexer operating at a scanning rate of up to 200 points per second. #5248 uses a solid state multiplexer operating at scanning rates up to 20K points per second, depending on the level of the input signal and mode of operation. For thermocouple operations, resistance bulb thermometer (RBT) termination cards are available to be used for measurement of the reference junction temperature. **Limitations:** All of the 32 analog input points must use the same type of multiplexer in each Multifunction Module. The RBT capability is available only on the multirange amplifier.

Analog Output -- provides one or two isolated analog output voltages. The output signal has a polarized full scale range from 0 to 10.24 volts, with a resolution of 10 bits and an accuracy of $\pm 0.15\%$ of full scale. Polarity of the output signal depends on which side of the isolated output is grounded. Analog Output operates under direct program control at a rate of 25KC (including amplifier settling time).

Attachment Accessories -- a customer access area is provided in the back of every I/O Module. Termination cards and connectors can be installed in this area to provide for connecting customer signals to the System/7 I/O interface. For detailed information, see "Attachment Accessories for System/7" under 5029.

Maximum: The total number of Input/Output Modules (5012,

5013, 5014 and 5022 in any combination) per system cannot exceed 11.

PREREQUISITE: One module location in a 5026 Enclosure mdl A2, C3, C6, D3 or D6.

System/7 Summary: GA34-0002

SPECIFY: [1] For location of the 5012 I/O Module, specify:

#9143 -- also enter the desired module location number, as shown in the chart on the 5026 page, in the quantity column of the order form. Specify #9142 in 5010 Processor Module.

#9144 -- for shipment without mounting in an enclosure (spare).

[2] Customer's signal wires enter through the rear side panels of the module. Three types of side panels are available: Type 1 provides a slot for cables ... Type 2 has individual holes for each pair of wires ... Type 3 is a blank panel that can be customized by the customer. Separate side panels are used for digital and analog input signal wires. For details, refer to System/7 Installation Manual - Physical Planning, GA34-0004.

For Digital Input/Output specify one:

#9501 -- Side Panel Digital Type 1

#9502 -- Side Panel Digital Type 2

#9503 -- Side Panel Digital Type 3

For Analog Input specify one:

#9511 -- Side Panel Analog Type 1

#9512 -- Side Panel Analog Type 2

#9513 -- Side Panel Analog Type 3

[3] When 2790 Control (#8195) is ordered on 5012 specify: #9444 (Multiloop Device) for each new 5012 in a multipoint system.

Note: When upgrading from a single loop system, #9444 must be ordered for the installed 5012 which contains #8195. (It must also be ordered on MES for any 5013 which has #8195.)

PRICES:	MDL	MAC/ MRC	Purchase	MMMC
5012	A1	\$ 49	\$1,170	\$11.50

Plan Offering: Plan B Warranty: A Maintenance: A
Purchase Option: 60% Useful Life Category: 2 Per Call: 2

SPECIAL FEATURES

2790 CONTROL (#8195). Interface for 2790 Data Communication devices. For 2790 devices supported by programming, see MSP/7 in "Programming." **Limitation:** Online diagnostics are available for maintenance of the 2790 - System/7 and must be implemented on all systems which include a 2792 or have more than sixteen area stations ... see page P7.3, System/7 Macro Library/Relocatable. All 5012 and 5013 modules with 2790 Control (#8195) must reside within the same 5026 Enclosure. See 2791/2793 Limitations, Loop Delay (2793 "Machines" page) for special configuring considerations. **Maximum:** One per 5012, four per System/7. MSP/7 provides support for a maximum of four 2792 mdl 1s (up to two per 2790 Control) or a maximum of sixty-four 2791/2792 mdl 1/2793s (16 per 2790 Control). **Prerequisite:** Customer signal connection required ... see 5029. **Field Installation:** Yes. **Market Support:** All bids of System/7 with three or four 2790 controls must be reviewed by the Boca Raton Sensor Based Market Support Center. This applies to upgraded systems as well as initial orders.

• ANALOG INPUT/OUTPUT

ANALOG BASIC (#1221). Provides the basic analog capability within the 5012. **Maximum:** One per 5012. **Field Installation:** Yes.

ANALOG OUTPUT CONTROL (#1245). Provides control for one or two Analog Output Points (#1246). **Maximum:** One per #1221. **Field Installation:** Yes. **Prerequisite:** Analog Basic (#1221).

ANALOG OUTPUT POINT (#1246). Provides a 0 to 10.24 volts isolated output signal. Polarity of the signal depends on the side of the signal that is grounded. **Maximum:** Two per #1245. **Prerequisites:** Analog Output Control (#1245) and its prerequisite ... customer signal connection required, see 5029. **Field Installation:** yes.

ANALOG INPUT CONTROL MOD B (#1232). Provides control and analog-to-digital conversion for an amplifier and 8 groups of mercury-wetted relay multiplexers. Multiplexing is at a maximum scanning rate of 200 points per second. **Limitation:** Cannot be ordered with Analog Input Control Mod C (#1213). **Maximum:** One per #1221. **Field Installation:** Yes. **Prerequisite:** Analog Basic (#1221).

AMPLIFIER HIGH LEVEL B (#1210). Provides a unity gain amplifier for high level analog input with a full scale range of ± 5.12 volts. **Limitation:** Cannot be ordered with Amplifier Multirange B (#1215). **Maximum:** One per #1232. **Field Installation:** Yes. **Prerequisite:** Analog Input Control Mod B (#1232).

AMPLIFIER MULTIRANGE B (#1215). Provides a multirange

5012 Multifunction Module (cont'd)

amplifier for analog input signals. Full scale ranges of ± 10 mv, ± 20 mv, ± 40 mv, ± 80 mv, ± 160 mv, ± 640 mv, and ± 5.12 volts can either be preset under program control or automatically selected during the conversion process. With preset gains, a resolution of 14 bits plus sign is obtained. With auto ranging, a resolution of 12 bits plus sign and 3 bits for gain indication is obtained. **Limitation:** Cannot be ordered with Amplifier High Level B (#1210). **Maximum:** One per #1232. **Field Installation:** Yes. **Prerequisite:** Analog Input Control Mod B (#1232).

MULTIPLEXER/MR4 (#5246). Provides a group of 4 mercury wetted relay multiplexer points for analog input signals. Multiplexing is at a maximum rate of 200 points per second. Signals may be in the range of 0 to ± 5.12 volts. **Maximum:** 8 per #1210 or #1215. **Field Installation:** Yes. **Prerequisites:** Amplifier High Level B (#1215) ... customer signal connection required, see 5029.

ANALOG INPUT CONTROL MOD C (#1213). Provides control and analog-to-digital conversion for an amplifier and 8 groups of solid state multiplexers. Multiplexer scanning rate is up to 14K points per second for low level signals, and up to 20K points per second for high level inputs. For auto ranging mode, maximum scanning rate is 7K points per second. **Limitation:** Cannot be ordered with Analog Input Control Mod B (#1232). **Maximum:** One per #1221. **Field Installation:** Yes. **Prerequisite:** Analog Basic (#1221).

AMPLIFIER HIGH LEVEL C (#1211). Provides a unity gain amplifier for high level analog input with a full scale range of ± 5.12 volts. **Limitation:** Cannot be ordered with Amplifier Multirange C (#1216). **Maximum:** One per #1213. **Field Installation:** Yes. **Prerequisite:** Analog Input Control Mod C (#1213).

AMPLIFIER MULTIRANGE C (#1216). Provides a multirange amplifier for analog input signals. Full scale ranges of ± 10 mv, ± 20 mv, ± 40 mv, ± 80 mv, ± 160 mv, ± 640 mv, and ± 5.12 volts can either be preset under program control or automatically selected during the conversion process. With preset gains, a resolution of 14 bits plus sign is obtained, while auto ranging provides a resolution of 12 bits plus sign and 3 bits gain indication. **Limitation:** Cannot be ordered with Amplifier High Level C (#1211). **Maximum:** One per #1213. **Field Installation:** Yes. **Prerequisite:** Analog Input Control Mod C (#1213).

MULTIPLEXER/MS4 (#5248). Provides a group of 4 solid state multiplexer points for analog input signals. Multiplexing is at a maximum scanning rate of 20,000 points per second. Signals may be in the range of 0 to ± 5.12 volts. **Maximum:** 8 per #1211 or #1216. **Field Installation:** Yes. **Prerequisites:** One Amplifier High Level C (#1211), or Amplifier Multirange C (#1216) ... customer signal connection required, see 5029.

TEMPERATURE REFERENCE ATTACH (#7830). Provides the capability to attach Termination Cards containing resistance bulb thermometers for determining the reference junction temperatures in thermocouple applications. See 5029. **Maximum:** one per #1221. **Field Installation:** Yes. **Prerequisites:** Amplifier Multirange B (#1215), or Amplifier Multirange C (#1216) ... customer signal connection required, see 5029.

• **DIGITAL INPUT/OUTPUT**

DIGITAL INPUT CONTROL (#3284). Provides control for up to 4 Digital Input (#3289 or #3292). **Maximum:** Two per 5012. **Field Installation:** Yes.

DIGITAL INPUT GROUP (#3289). Provides 16 latching on non-latching digital input voltage or contact points. The voltage or contact and the isolation capability of each point is determined by the Termination Card used. **Maximum:** Four #3289 or #3292 in any combination per #3284. **Field Installation:** Yes. **Prerequisites:** Digital Input Control (#3284) ... customer signal connection required, see 5029.

PROCESS INTERRUPT (#5710). Converts a Digital Input Group (#3289) to a process interrupt group. **Limitation:** #5710 cannot be installed on Digital Input Non-Isolated (#3292). **Maximum:** Two per 5012 ... can only be used with the first two groups of Digital Input Group (#3289) in a 5012. **Field Installation:** Yes. **Prerequisite:** Digital Input Group (#3289).

DIGITAL INPUT NON-ISOLATED (#3292). Provides 16 latching or non-latching points of contact sense capability. Input signals are referenced to frame ground. **Limitation:** Cannot be modified by Process Interrupt (#5710). **Maximum:** Four #3289 or #3292 in any combination per #3284. **Field Installation:** Yes. **Prerequisites:** Digital Input Control (#3284) ... customer signal connection required, see 5029.

FUNCTION max., one per group	1st Digital Input Control (#3284)				2nd Digital Input Control (#3284)			
	1st Group	2nd Group	3rd Group	4th Group	5th Group	6th Group	7th Group	8th Group
DIGITAL INPUT ISOLATED	3289	3289	3289	3289	3289	3289	3289	3289
PROCESS INTERRUPT ISOLATED	3289 plus 5710	3289 plus 5710	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
DIGITAL INPUT NON-ISOLATED	3292	3292	3292	3292	3292	3292	3292	3292
PROCESS INTERRUPT NON-ISOLATED	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available

DIGITAL OUTPUT CONTROL (#3296). Provides control for up to four groups of Digital Outputs (#3420, 3421, 3422, 3424) in any combination. **Maximum:** One per 5012. **Field Installation:** Yes.

DO CONTACT GROUP (#3420). Provides 16 isolated single pole Form A mercury wetted relay contacts rated at 125 V dc max or 88 V ac RMS, 2A ac RMS max; the product of peak voltage and peak current must not exceed 100 (100 VA max.). **Maximum:** Four #3420, 3421, 3422, 3424 in any combination per #3296. **Field Installation:** Yes. **Prerequisites:** Digital Output Control (#3296) ... customer signal connection required, see 5029.

DO LOW POWER GROUP (#3421). Provides 16 low power (4 ma, 6 V) digital output points. No user power is required. **Maximum:** Four #3420, 3421, 3422, 3424 in any combination per #3296. **Field Installation:** Yes. **Prerequisites:** Digital Output Control (#3296) ... customer signal connection required, see 5029.

DO MEDIUM POWER GROUP (#3422). Provides 16 isolated medium power solid state digital output switches. Power, up to 48 V dc, and 450 ma, must be provided by the user. **Maximum:** Four #3420, 3421, 3422, 3424 in any combination per #3296. **Field Installation:** Yes. **Prerequisites:** Digital Input Control (#3296) ... customer signal connection required, see 5029.

DO MEDIUM POWER NON-ISOLATED (#3424). Provides 16 non-isolated medium power (0 ma at 5.5 V to 12 ma at 2.4 V supplied by IBM) solid state digital output switches. Output signals are referenced to frame ground. Customer provided loads up to 450 ma at 52.8 V dc can be switched. **Maximum:** Four #3420, 3421, 3422, 3424 in any combination per #3296. **Field Installation:** Yes. **Prerequisites:** Digital Output Control (#3296) ... customer signal connection required, see 5029.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC
2790 Control	#8195	\$128	\$2,610 \$11.50
Analog Input/Output			
Amplifier High Level B	1210	10	327 1.00
Amplifier High Level C	1211	63	1,305 7.00
Amplifier Multirange B	1215	49	1,045 2.50
Amplifier Multirange C	1216	101	2,085 2.50
Analog Basic	1221	36	78 2.00
Analog Input Control MOD B	1232	128	3,185 40.50
Analog Input Control MOD C	1213	218	4,425 54.00
Analog Output Control	1245	36	780 12.50
Analog Output Point	1246	49	1,305 7.50
Multiplexer/MR4	5246	11	287 2.50
Multiplexer/MS4	5248	10	261 1.50
Temp. Ref. Attachment	7830	10	261 1.50

Digital Input/Output			
Digital Input Control	3284	13	352 2.50
Digital Input Group	3289	16	391 5.00
Digital Input Non-Isolated	3292	8	196 1.50
Digital Output Control	3296	24	522 2.00
DO Contact Group	3420	49	1,045 6.50
DO Low Power Group	3421	24	522 3.50
DO Medium Power Group	3422	36	780 7.00
DO Med Power Non-Isolated	3424	16	391 2.00
Process Interrupt	5710	10	261 1.50

ATTACHMENT ACCESSORIES -- Termination Cards and connectors for customer signal wires are provided as accessories in the 5029. For details, see 5029.

Note: Specifications stated in the sales manual are a generalized description of the system features. Detail specifications for System/7 Sensor I/O features must be quoted or proposed from the latest revision of the IBM System/7 Installation Manual - Physical Planning, GA34-0004.

5013 DIGITAL INPUT/OUTPUT MODULE

Purpose: To provide digital input/output, expansion capability for custom products, and 2790 control on a System/7.

Highlights: Designed specifically to provide expansion capability for applications that require custom products along with digital input/output and 2790 control.

Provides capability for:

- Expansion for Custom Products
- Attachment of a 2790 Control
- Up to 128 digital input points
- Up to 32 isolated process interrupt points
- Up to 64 digital output points

Expansion Capability -- provides the space, power, and logical interface to attach various Custom Products to the System/7.

2790 Control: Provides the required logical interface for attachment of 2790 Data Communication devices to System/7. This allows System/7 to act as the "System Controller" for 2791/2793 Area Stations or 2792 Remote Communication Controller. The 2790 Control allows transmission of data between System/7 and the 2791/2793 Area Stations (and 2795/2796/2797 Data Entry Units, and 2798 Guidance Display Units). Transmission rate is approximately 500,000 bits per second (900 characters per second). See 2790 in "Systems". The combined number of 2791/2793s and 2792 mdl 1s on each 5012 or 5013 may not exceed 16. **Maximum:** Four 2790 Controls per system, one per 5013 Digital Input/Output Module.

Digital Input -- provides up to 8 groups of 16 digital input points. Either isolated or non-isolated Digital Input groups are available. Each digital input point is a voltage or contact sense, 2-terminal circuit. Each group can be program controlled for latching or non-latching operation. Any one of the 8 groups may be read under direct program control. The first two groups of digital inputs may be converted to process interrupt points through the addition of the Process Interrupt feature.

Process Interrupt -- an "interrupt on change" feature is offered on the first two groups of digital inputs. This feature provides the capability to compare the input of the 16-bit groups against a program loadable 16-bit register and initiate an interrupt on either an equal or unequal comparison.

Digital Output -- provides up to 4 groups of 16 digital output points. Each digital output point may be set or reset under program control. Each Digital Output group may be one of the following circuit types: Low Power, Medium Power, Medium Power Non-Isolated, or Contact output. Low Power output provides switching with a maximum rating of 6 volts at 4 milliamps. Medium Power and Medium Power Non-Isolated operate up to 48 volts at 450 milliamps. Contact Output provides a Form A mercury wetted relay contact rated at 125 V dc max or 88 V ac RMS max, 2 A ac RMS max; the product of peak voltage and peak current must not exceed 100 (100 VA max). Digital outputs operate under direct program control. Medium Power and Contact Output points are isolated and may be directly connected to the standard Digital Input points. This provides the capability for wrap-around testing and multiplexing of digital and analog inputs with digital output points.

Maximum: The total number of Input/Output Modules (5012, 5013, 5014 and 5022 in any combination) per system may not exceed 11.

Prerequisite: One module location in a 5026 Enclosure mdl A2, C3, C6, D3 or D6.

System/7 Summary: GA34-0002

Specify: [1] For location of the 5013 I/O Module, specify:

#9143 -- also enter the desired module location number, as shown in the chart on page M 5026, in the quantity column of the order form. Specify #9142 in the 5010 Processor Module.

#9144 -- for shipment without mounting in an enclosure (spare).

[2] Customer's signal wires enter through the rear side panels of the module. Three types of side panels are available: Type 1 provides a slot for cables; Type 2 has individual holes for each pair of wires; Type 3 is a blank panel that can be customized by the customer. Separate side panels are used for digital and analog input signals. For details, refer to IBM System/7 Installation Manual - Physical Planning, GA34-0004.

For Digital Input/Output specify one:

- #9501** -- Side Panel Digital Type 1
- #9502** -- Side Panel Digital Type 2
- #9503** -- Side Panel Digital Type 3

[3] When 2790 Control (#8195) is ordered on 5013 specify: **#9444**

(Multiloop Device) for each new 5013 in a multiloop system. **Note:** When upgrading from a single loop system, #9444 must be ordered for the installed 5013 which contains #8195. (It must also be ordered for any 5012 which has #8195.)

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	5013 A1	\$ 49	\$1,170	\$ 9.50
	Plan Offering: Plan B	Warranty: A	Maintenance: A	
	Purchase Option: 60%	Useful Life Category: 2	Per Call: 2	

SPECIAL FEATURES

2790 CONTROL (#8195). Interface for 2790 Data Communication devices. For 2790 devices supported by programming, see MSP/7 in "Programming." **Limitation:** Online diagnostics are available for maintenance of the 2790 - System/7 and must be implemented on all systems which include a 2792 or have more than 16 area stations ... see page P7.3 Macro Library/Relocatable. All 5012 and 5013 modules with 2790 Control (#8195) must reside within the same 5026 Enclosure. See 2791/2793 Limitations, Loop Delay (2793 "Machines" page) for special configuring considerations. **Maximum:** One per 5013, four per System/7. MSP/7 provides support for a maximum of four 2792 mdl 1s (up to two per 2790 control) or a maximum of sixty-four 2791/2792 mdl 1/2793s (16 per 2790 control). **Field Installation:** Yes. **Prerequisite:** Customer signal connection required, see 5029.

• DIGITAL INPUT/OUTPUT FEATURES

DIGITAL INPUT CONTROL (#3284). Provides control of up to 4 Digital Input (#3289 or #3292) groups. **Maximum:** Two per 5013. **Field Installation:** Yes.

DIGITAL INPUT GROUP (#3289). Provides 16 latching or non-latching digital input voltage or contact points. The voltage or contact and the isolation capability of each point is determined by the Termination Card used. **Maximum:** Four #3289 or #3292 in any combination per #3284. **Field Installation:** Yes. **Prerequisites:** Digital Input Control (#3284) ... customer signal connection required, see 5029.

PROCESS INTERRUPT (#5710). Converts a Digital Input Group (#3289) to a process interrupt group. **Limitation:** #5710 cannot be installed on Digital Input Non-Isolated (#3292). **Maximum:** Two per 5013 ... can only be used with the first two groups of Digital Input Group (#3289) in a 5013. **Field Installation:** Yes. **Prerequisite:** Digital Input Group (#3289) and its prerequisite.

DIGITAL INPUT NON-ISOLATED (#3292). Provides 16 latching or non-latching points of contact sense capability. Input signals are referenced to frame ground. **Limitation:** Cannot be modified by Process Interrupt (#5710). **Maximum:** Four #3289 or #3292 in any combination per #3284. **Field Installation:** Yes. **Prerequisite:** Digital Input Control (#3284) ... customer signal connection required, see 5029.

FUNCTION max., one per group	1st Digital Input Control # (3284)				2nd Digital Input Control # (3284)			
	1st Group	2nd Group	3rd Group	4th Group	5th Group	6th Group	7th Group	8th Group
DIGITAL IN- PUT ISOLAT- ED	3289	3289	3289	3289	3289	3289	3289	3289
PROCESS IN- TERRUPT ISO- LATED	3289 plus 5710	3289 plus 5710	Not Available	Not Available	Not Available	Not Available	Not Available	Not Avail- able
DIGITAL IN- PUT NON- ISOLATED	3292	3292	3292	3292	3292	3292	3292	3292
PROCESS IN- TERRUPT NON- ISOLATED	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Avail- able

DIGITAL OUTPUT CONTROL (#3296). Provides control for up to four groups of Digital Outputs (#3420, 3421, 3422, 3424) in any combination. **Maximum:** One per 5013. **Field Installation:** Yes.

DO CONTACT GROUP (#3420). Provides 16 isolated single pole Form A mercury wetted relay contacts rated at 125 V dc max or 88 V ac RMS max, 2A ac RMS max; the product of peak voltage and peak current not to exceed 100 (100 VA max). **Maximum:** Four #3420, 3421, 3422, 3424 in any combination per #3296. **Field Installation:** Yes. **Prerequisites:** Digital Output Control (#3296) ... customer signal connection required, see 5029.

DO LOW POWER GROUP (#3421). Provides 16 low power (4 ma, 6 V) digital output points. No user power supply is required.

5013 Digital Input/Output Module (cont'd)

Maximum: Four #3420, 3421, 3422, 3424 in any combination per #3296. **Field Installation:** Yes. **Prerequisites:** Digital Output Control (#3296) ... customer signal connection required, see 5029.

DO MEDIUM POWER GROUP (#3422). Provides 16 isolated medium power solid state digital output switches. Power, up to 48 V dc, and 450 ma, must be provided by the user. **Maximum:** Four #3420, 3421, 3422, 3424 in any combination per #3296. **Field Installation:** Yes. **Prerequisites:** Digital Output Control (#3296) ... customer signal connection required, see 5029.

DO MEDIUM POWER NON-ISOLATED (#3424). Provides 16 non-isolated medium power (0 ma at 5.5 V to 12 ma at 2.4 V supplied by IBM) solid state digital output switches. Output signals are referenced to frame ground. Customer powered loads up to 450 ma at 52.8 V dc can be switched. **Maximum:** Four #3420, 3421, 3422, 3424 in any combination per #2396. **Field Installation:** Yes. **Prerequisites:** Digital Output Control (#3296) ... customer signal connection required, see 5029.

Special Feature Prices:		MAC/ MRC	Purchase, MMMC	
2790 Control	#8195	\$128	\$2,610	\$ 9.50
Digital Input/Output Features				
Digital Input Control	3284	13	352	2.50
Digital Input Group	3289	16	391	4.50
Digital Input Non-Isolated	3292	8	196	1.50
Digital Output Control	3296	24	522	2.00
DO Contact Group	3420	49	1,045	5.50
DO Low Power Group	3421	24	522	3.00
DO Medium Power Group	3422	36	780	6.00
DO Med Power Non-Isolated	3424	16	391	2.00
Process Interrupt	5710	10	261	1.50

ATTACHMENT ACCESSORIES: Termination Cards and connectors for customer signal wires are provided as accessories in the 5029 mdl 1. For details, see M 5029.

Note: Specifications stated in the sales manual are a generalized description of the system features. Detail specifications for System/7 Sensor I/O features must be quoted or proposed from the latest version of the IBM System/7 Installation Manual - Physical Planning, GA34-0004.

5014 ANALOG INPUT MODULE

Purpose: To provide System/7 with the capability to use voltage signals as input data. The 5014 Analog Input Module provides capability for up to 128 analog input points.

- Model B1** -- Scanning rate up to 200 points per second.
- Model C1** -- Scanning rate up to 20,000 points per second.
- Model D1** -- Scanning rate up to 100 points per second.
- Model E1** -- Expander for 5014 model D1.
- Model E2** -- Expander for 5014 model B1.

Model Changes: Changes between model E1 and model E2 are field installable. Model changes from B to C to D and vice versa are not recommended for field installation.

Highlights: Provides analog input capability including multiplexing, amplification, and analog-to-digital conversion. Five models are available: Model B1 uses mercury wetted relay multiplexers with a maximum scanning rate of 200 points per second; Model C1 uses a solid state multiplexer with a maximum scanning rate of 7,000 to 20,000 points per second; Model D1, with a maximum scanning rate of 100 points per second, uses either mercury wetted or dry contact relay multiplexers; Model E1 is an expander module connected to model D1 sharing the amplifier and analog-to-digital converter of the model D1 and using either type of multiplexer; Model E2 is an expander module connected to model B1 sharing the amplifier and analog-to-digital converter of the model B1 and using mercury wetted relay multiplexers. Input signals may range from 0 to ±5.12 volts full scale with mercury wetted relay multiplexers and solid state multiplexers. Input signals may range from -640 mv to +5.12 volts full scale with dry contact relay multiplexers.

The analog-to-digital converter has a resolution of 14 bits plus sign. Analog conversion and point addressing of the multiplexers are under program control. Immediate and External synchronization operations are both available. A special feature provides for attachment of resistance bulb thermometer (RBT) termination cards for determining the reference junction temperature in thermocouple applications. Connection of customer signals and signal conditioning is achieved by termination cards in the customer access area at the back of the Analog Input Module. **LIMITATIONS:** The first model E1 must be located directly under its associated model D1. The second model E1 must be located directly under the first model E1. The first model E2 must be located directly under its

associated model B1. The second model E2 must be located directly under the first model E2.

Maximum: Total number of Input/Output Modules (5012, 5013, 5014, 5022, and Customer Product Modules in any combination) per system cannot exceed 11.

PREREQUISITE: One module location in 5026 Enclosure mdls A2, C3, C6, D3 or D6.

System/7 Summary: GA34-0002

Specify: [1] For location of the 5014 I/O Module, specify:

- #9143 -- also enter the desired module location number, as shown in the chart on page M 5026, in the quantity column of the order form. Specify #9142 in the 5010 Processor Module.
- #9144 -- for shipment without mounting in an enclosure (spare).

[2] Customer's signal wires enter through the rear side panels of the module. Three types of panels are available; Type 1 provides a slot for cables; Type 2 has individual holes for each pair of wires; Type 3 is a blank panel that can be customized by the customer. For details refer to IBM System/7 Installation Manual - Physical Planning, GA34-0002. Specify One;

- #9511 -- Side Panel Analog Type 1
- #9512 -- Side Panel Analog Type 2
- #9513 -- Side Panel Analog Type 3

[3] On each 5014 mdl 3 specify one of the following: #9185 -- for expansion from 128 to 256 points. (First 5014 mdl E is connected to a single 5014 mdl B or D). #9186 -- for expansion from 256 to 384 points. (Second 5014 mdl E is connected to a single 5014 mdl B or D.)

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
5014	B1	\$ 193	\$3,905	\$40.50
	C1	283	5,725	59.50
	D1	193	3,905	39.00
	E1	48	1,020	1.00
	E2	48	1,020	1.00

Plan Offering: Plan B Warranty: A Maintenance: B
Purchase Option: 60% Useful Life Category: 2 Per Call: 2

MODEL DESCRIPTIONS

Model B1 -- provides amplification, analog-to-digital conversion, and addressing of 128 analog input points at a scanning rate up to 200 points per second using mercury wetted relay multiplexers. A special feature provides addressing for an additional 256 points in two attached model E2s (total 384 points).

Model C1 -- provides amplification, analog-to-digital conversion, and addressing of 128 analog input points at a scanning rate up to 20,000 points per second using solid state multiplexers. The maximum scanning rate is dependent upon the input signal level and mode of operation. Low level signals may be scanned at a maximum rate of 14,000 points per second. High level signals may be scanned at a maximum rate of 20,000 points per second. Maximum scanning rate with auto ranging is 7,000 points per second.

Model D1 -- provides amplification, analog-to-digital conversion, and addressing of 384 analog input points at a scanning rate up to 100 points per second using mercury wetted relay or dry contact relay multiplexers. The first 128 points of relay multiplexers are installed in the model D1. The second 128 points of relay multiplexers are installed in a model E1 attached to the model D1. The third 128 points of relay multiplexers are installed in a model E1 attached to the first model E1.

Model E1 -- expansion model for model D1. Provides for 128 analog input points selected by mercury wetted relay or dry contact relay multiplexers. It is connected to and uses the amplification, analog-to-digital conversion, and addressing circuits of a model D1. The maximum scanning speed is the same as the model D1 (100 points per second). **LIMITATION:** The first model E1 must be located directly under the model D1 to which it is attached. The second model E1 must be located directly under the first model E1. **MAXIMUM:** Two per 5014 mdl D1. **PREREQUISITE:** 5014 mdl D1.

Model E2 -- expansion module for model B1. Provides for 128 analog input points selected by mercury wetted relay multiplexers. It is connected to and uses the amplification, analog-to-digital conversion, and addressing circuits of a model B1. The maximum scanning speed is the same as the model B1 (200 points per second). **LIMITATION:** The first model E2 must be located directly under the model B1 to which it is attached. The second model E2 must be located directly under the first model E2. **MAXIMUM:** Two per 5014 mdl B1. **PREREQUISITE:** Analog Input Expander (#1250) on the 5014 mdl B1.

SPECIAL FEATURES

AMPLIFIER HIGH LEVEL B (#1210). [mdl B1 only] Provides a

5014 Analog Input Module (cont'd)

unity gain amplifier for high level analog input signals with a full scale range of ± 5.12 volts. **Limitation:** Cannot be ordered with Amplifier Multirange B (#1215). **Maximum:** One per 5014 mdl B1. **Field Installation:** Yes.

AMPLIFIER HIGH LEVEL C (#1211). [mdl C1 only] Provides a unity gain amplifier for high level analog input signals with a full scale range of ± 5.12 volts. **Limitation:** Cannot be ordered with Amplifier Multirange C (#1216). **Maximum:** One per 5014 mdl C1. **Field Installation:** Yes.

AMPLIFIER HIGH LEVEL D (#1212). [mdl D1 only] Provides a unity gain amplifier for high level analog input signals with a full scale range of ± 5.12 volts with Multiplexer/MR16 (#5247) or -640 mv to +5.12 volts with Multiplexer/MD16 (#5245). **Limitation:** Cannot be ordered with Amplifier Multirange D (#1217). **Maximum:** One per 5014 mdl D1. **Field Installation:** Yes.

AMPLIFIER MULTIRANGE B (#1215). [mdl B1 only] Provides a multirange amplifier for analog input signals. The amplifier gains can be set by the program or determined automatically by the amplifier. Amplifier ranges are ± 10 mv, ± 20 mv, ± 40 mv, ± 80 mv, ± 160 mv, ± 640 mv, and ± 5.12 volts full scale. In program selected gain mode of operation, 14 bits of data plus sign are generated. In auto ranging mode of operation, 12 bits of data plus sign are generated. The remaining 3 bits are used to indicate the range. **Limitation:** Cannot be ordered with Amplifier High Level B (#1210). **Maximum:** One per 5014 mdl B1. **Field Installation:** Yes.

AMPLIFIER MULTIRANGE C (#1216). [mdl C1 only] Provides a multirange amplifier for analog input signals. The amplifier gains can be set by the program or determined automatically by the amplifier. Amplifier ranges are ± 10 mv, ± 20 mv, ± 40 mv, ± 80 mv, ± 160 mv, ± 640 mv, and ± 5.12 volts. In program selected gain mode of operation, 14 bits of data plus sign are generated. In auto ranging mode of operation, 12 bits of data plus sign are generated. The remaining 3 bits are used to indicate the range. **Limitation:** Cannot be ordered with Amplifier High Level C (#1211). **Maximum:** One per 5014 mdl C1. **Field Installation:** Yes.

AMPLIFIER MULTIRANGE D (#1217). [mdl D1 only] Provides a multirange amplifier for analog input signals. The amplifier gain is set by the program. When used with Multiplexer/MR16 (#5247), the full scale ranges are ± 10 mv, ± 20 mv, ± 40 mv, ± 80 mv, ± 160 mv, ± 640 mv, and ± 5.12 volts. When used with Multiplexer/MD16 (#5245), all of the above ranges are available with the exception that the ± 5.12 volt range is modified to the range of -640mv to +5.12 volts. 14 bits of data plus sign are generated. **Limitation:** Cannot be ordered with Amplifier High Level D (#1212). **Maximum:** One per 5014 mdl D1. **Field Installation:** Yes.

ANALOG INPUT ADAPTER B (#1230). [mdl B1 only] Provides capability for two Multiplexer/MR16 (#5247) groups. **Maximum:** Four per 5014 mdl B1. **Field Installation:** Yes. **Prerequisite:** Amplifier High Level B (#1210) or Amplifier Multirange B (#1215).

ANALOG INPUT ADAPTER C (#1231). [mdl C1 only] Provides capability for two Multiplexer/MS16 (#5249) groups. **Maximum:** Four per 5014 mdl C1. **Field Installation:** Yes. **Prerequisite:** Amplifier High Level C (#1211) or Amplifier Multirange C (#1216).

ANALOG INPUT ADAPTER D/E (#1233). [mdl D1, E1 and E2 only] Provides capability for two Multiplexer/MR16 (#5247) groups on mdls D1, E1, E2, or two Multiplexer/MD16 (#5245) groups on mdls D1, E1. **Maximum:** Four per 5014 mdls D1, E1 or E2. **Field Installation:** Yes. **Prerequisite:** Amplifier High Level D (#1212) or Amplifier Multirange D (#1217) on 5014 mdl D1.

ANALOG INPUT EXPANDER B (#1250). [mdl B1 only] Provides the capability to attach one or two 5014 mdl E2s to a 5014 mdl B1. This provides up to 384 analog input point addresses on a 5014 mdl B1. **Maximum:** One per 5014 mdl B1. **Field Installation:** Yes. **Prerequisite:** Amplifier High Level B (#1210) or Amplifier Multirange B (#1215).

MULTIPLEXER/MD16 (#5245). [mdl D1 and E1 only] Provides a group of 16 analog input points. Input points are multiplexed by dry contact relays. Input signals can be in the range of -640mv to +5.12 volts. **Limitation:** The combined quantity of Multiplexer/MD16 (#5245) and Multiplexer/MR16 (#5247) must not exceed two per Analog Input Adapter D/E (#1233). Common mode voltage must not exceed 100 volts and the average sampling rate per point must not exceed 20 samples per minute when averaged over at least 24 hours. This means that a single input point must not be addressed more than 28,800 times in 24 hours. **Maximum:** Two per Analog Input Adapter D/E (#1233). **Field Installation:** Yes. **Prerequisites:** Analog Input Adapter D/E (#1233). Customer signal connection required, see 5029.

MULTIPLEXER/MR16 (#5247). [mdl B1, D1, E1 or E2 only] Provides a group of 16 analog input points. Input points are multiplexed by mercury wetted relays. Input signals can be in the range of ± 5.12 volts. **Limitation:** The combined quantity of Multiplexer/MR16 (#5247) and Multiplexer/MD16 (#5245) must not exceed two per Analog Input Adapter B (#1230) or Analog Input Adapter D/E (#1233). Common mode voltage must not exceed 250 volts and the average sampling rate is not limited.

Maximum: Two per Analog Input Adapter B (#1230) or Analog Input Adapter D/E (#1233). **Field Installation:** Yes. **Prerequisites:** Analog Input Adapter B (#1230) on 5014 mdl B1 or Analog Input Adapter D/E (#1233) on mdls D1, E1 or E2. Customer signal connection required, see 5029.

MULTIPLEXER/MS16 (#5249). [mdl C1 only] Provides a group of 16 analog input points. Input points are multiplexed by solid state switches. Input signals can be in the range of ± 5.12 volts. **Limitation:** Common mode voltage must not exceed 10 volts and the average sampling rate is not limited. **Maximum:** Two per Analog Input Adapter C (#1231). **Field Installation:** Yes. **Prerequisites:** Analog Input Adapter C (#1231). Customer signal connection required, see 5029.

TEMPERATURE REFERENCE ATTACH (#7830). [mdl B1, C1, or D1 only] Provides the capability to attach termination cards containing resistance bulb thermometers (RBT) ... see M 5029. When this feature is installed in a 5014 mdl B1 or D1 the capability is extended to 5014 mdl E1 or E2 associated with it. **Limitation:** A maximum of 32 RBT termination cards can be attached to one Temperature Reference Attach (#7830). **Maximum:** One per 5014 mdls B1, C1 and D1. **Field Installation:** Yes. **Prerequisite:** Amplifier Multirange B (#1215), Amplifier Multirange C (#1216) or Amplifier Multirange D (#1217).

Special Feature Prices:		MAC/ MRC	Purchase	MMMC
Amplifier High Level B	#1210	\$ 10	\$ 327	\$ 1.00
Amplifier High Level C	1211	63	1,305	7.00
Amplifier High Level D	1212	10	327	1.00
Amplifier Multirange B	1215	49	1,045	2.50
Amplifier Multirange C	1216	101	2,085	2.50
Amplifier Multirange D	1217	49	1,045	2.50
Analog Input Adapter B	1230	13	391	1.50
Analog Input Adapter C	1231	13	391	1.50
Analog Input Adapter D/E	1233	13	391	1.50
Analog Input Expander B	1250	31	651	7.00
Multiplexer/MD16	5245	35	758	14.50
Multiplexer/MR16	5247	54	1,145	11.00
Multiplexer/MS16	5249	49	1,045	3.50
Temperature Ref Attach	7830	10	261	1.50

Maximum Feature Quantity Per Model

FEATURE	Mdl B1 200 pt per sec	Mdl C1 20K pt per sec	Mdl D1 100 pt per sec	Mdl E1 100 pt per sec	Mdl E2 200 pt per sec
Amplifier High Level B (1210)	1	0	0	0	0
Amplifier High Level C (1211)	0	1	0	0	0
Amplifier High Level D (1212)	0	0	1	0	0
Amplifier Multirange B (1215)	1	0	0	0	0
Amplifier Multirange C (1216)	0	1	0	0	0
Amplifier Multirange D (1217)	0	0	1	0	0
Analog Input Adapter B (1230)	4	0	0	0	0
Analog Input Adapter C (1231)	0	4	0	0	0
Analog Input Adapter D/E (1233)	0	0	4	4	4
Analog Input Expander B (1250)	1	0	0	0	0
Multiplexer/MD16 (5245)	0	0	8	8	0
Multiplexer/MR16 (5247)	8	0	8	8	8
Multiplexer/MS16 (5249)	0	8	0	0	0
Temperature Ref Attach (7830)	1	1	1	0	0

5022 DISK STORAGE MODULE

Purpose: Disk Storage Unit for System/7.

Model 1 Single Drive -- 2.457 million 16-bit words ... access 200 cylinders on removable cartridge and 200 cylinders on its non-removable disk ... 269 millisecond average access time.

Model 2 Single Drive -- same as Model 1 except 126 millisecond average access time.

Model 3 Single Drive -- 1.228 million 16-bit words ... access 200 cylinders on one non-removable disk ... average access time 269 milliseconds.

Model 4 Single Drive -- same as Model 3 except 126 millisecond average access time.

Model Changes: Field Installable.

Highlights:

Removable Disk Cartridges -- each 5022 mdl 1 or 2 uses a removable 5440 Disk Cartridge that provides virtually unlimited offline disk storage. 5440s must be ordered separately.

Cylinder Concept -- the access mechanism with four vertically aligned heads gives access to the top and bottom tracks of both the removable 5440 and the 5022's non-removable disk for model 1 or model 2. With one positioning of the access mechanism, 12,288 sixteen-bit words are available.

The access mechanism on model 3 or model 4 with two vertically aligned heads gives access to the top and bottom tracks of the non-removable disk, providing 6,144 sixteen-bit words with one positioning of the access mechanism.

Formats -- each of the 200 customer usable cylinders, three alternate cylinders and one CE cylinder on each disk is composed of two tracks of 24 sectors each. Each sector provides a fixed length 128 word data field.

Housing -- the 5022 can reside in an I/O module location in any of the 5026 enclosures. However, it is recommended that it be installed in the bottom module location for user accessibility ... see "Specify" [1] below.

Access Times -- minimum access time is 39 milliseconds, average is 269 milliseconds and maximum is 750 milliseconds for model 1 or model 3.

Minimum access time is 28 milliseconds, average is 126 milliseconds and maximum is 255 milliseconds for model 2 or model 4.

Data Transfer Rate -- the disk rotates at 1500 rpm, yielding a data rate of 99,500 words per second and a rotational period of 40 milliseconds.

PREREQUISITES:

- (1) An available I/O module location in the 5026 Enclosure.
- (2) Each 5022 mdl 1 or 2 requires a 5440 Disk Cartridge.
- (3) Integral Power Supply (#4650) is required for:
 - a) Each additional 5022 after the first 5022 within a single 5026 Enclosure.
 - b) A 5022 installed in a 5026 mdl A2.

Configuration: Multiple 5022s may be installed on a single System/7. IBM supplied programming support for the Disk Cycle Steal (#2664) feature is mutually exclusive with Direct Program Control Disk support. Drives of both types are not supported on the same system. Multiple drives of either type are supported.

System/7 Summary: GA34-0002

Specify: [1] For location of the 5022 Disk Storage Module, specify: #9143 - also enter the desired module location number, as shown under the 5026, in the quantity column of the order form. #9144 - for shipment without mounting in an enclosure (spare). **LIMITATIONS:** the following limitations apply to the location where a 5022 module can be installed in a 5026 Enclosure.

- (a) A 5022 cannot be located in a top position of a 5026 (module locations 0, 3, 6 or 9).
- (b) It is recommended that 5022s be located in the bottom position of a 5026 enclosure (module locations 2, 5, 8 or 11). Only when absolutely necessary should a 5022 be located in the middle position of a 5026 enclosure (module locations 1, 4, 7 or 10).
- (c) Locating a 5022 mdl 3 or 4 in the bottom position of a 5026 enclosure in systems without Internal Air Isolation (#4621 or #4622) will increase its maximum allowable operating temperature from 90°F to 105°F.
- (d) Housing a 5022 in a 5026 mdl D3 or D6 is not recommended due to the increased processor loading during data transfer.

[2] Each 5022 mdl 1 or mdl 2 requires a 5440 Disk Cartridge which must be ordered separately

[3] Integral Power Supply (#4650) is required for: (1) Installation of each additional 5022 after the first 5022 within a single 5026 Enclosure, or (2) a 5022 installed in a 5026 mdl A2 ... see "Special Features" below.

[4] Power: Must be consistent with that of the 5026 Enclosure ... see voltage feature #s under "Specify" for the 5026.

PRICES:	Mdl	MAC/MRC	Purchase	MMMC
5022	1	\$ 504	\$9,640	\$88.50
	2	590	10,530	97.00
	3	387	8,620	84.50
	4	472	9,445	92.50

Plan Offering: Plan B Warranty: B Maintenance: C
Purchase Option: 45% Useful Life Category: 2 Per Call: 2

SPECIAL FEATURES

DISK CYCLE STEAL (#2664). Provides data transfers between the 5022 and main storage of a 5010 equipped with companion Cycle Steal Basic (#2662) feature. **Limitation:** One per 5022. **Field Installation:** Yes. **Prerequisite:** Cycle Steal Basic (#2662) on the 5010.

INTEGRAL POWER SUPPLY (#4650). Provides 24 volts power supply which is required for: (1) Installation of each additional 5022 after the first 5022 within a single 5026 Enclosure, and (2) Installation of 5022 on a 5026 Enclosure mdl A2. **Field Installation:** Yes.

Special Feature Prices:	MAC/MRC	Purchase	MMMC
Disk Cycle Steal	#2664	\$ 16	\$ 391
Integral Power Supply	4650	42	908
			1.00

Environment: The 5022 operates within the following temperature and humidity range.

Temperature **	60-90°F
Relative Humidity	8-95%
Max. Wet Bulb Temperature	85°F
Non-operating Temperature	50-110°F
Non-operating Humidity	8-95%

** In systems without Air Isolation (#4621 or #4622 on 5026), the maximum operating temperature for a 5022 mdl 3 or 4 (fixed pack) is 105°F if the disk is located in the bottom position of a 5026 Enclosure (module locations 2, 5, 8 or 11).

5024 I/O ATTACHMENT ENCLOSURE

[Be sure to specify a print belt language code except for #5550 ... see Specify.]

Purpose: To provide line printing and/or card reading capability for System/7.

- Model 1** Basic Enclosure with Line Printer.
- Model 2** Basic Enclosure with 2502 Attachment.
- Model 3** Expanded Enclosure with Line Printer and 2502 Attachment.

Highlights:

Enclosure -- the 5024 I/O Attachment Enclosure is a data processing oriented addition to the System/7. The enclosure provides basic space, power and logic to attach a printer, a card reader, or both. If both a printer and a card reader are utilized, an enclosure expansion is provided. The 5024 attaches to any 5010 Processor Module Model E equipped with 5024 Attachment Feature (#4115). A fixed length cable is supplied with the 5024 (see Physical Planning Manual for further details).

5024 Attachment Feature (#4115) on 5010 -- provides the interface between the 5010 mdl E and the 5024 and handles data transfers between 5010 mdl E storage and the 5024 on a cycle steal basis. Cycle Steal Basic (#2662) is required on the 5010 mdl E. If both a card reader and a printer are attached, operations may be interleaved but not overlapped. In the interleave mode of operation, performance of the devices will be less than the individual unit's rated speed of 300 cpm reading and 155 lpm printing. For more details see SRL GA34-0002. Only one 5024 may be attached per 5010 mdl E. The 5024 attachment is mutually exclusive with 1200 bps Integrated Modems (#5500, 5501) and S/360/370 Channel Attachment (RPQ). All systems planning to use any 5010 RPQ together with Feature Code #4115 must re-submit the RPQ for evaluation

PREREQUISITES: Cycle Steal Basic (#2662) and 5024 Attachment Feature (#4115) on a 5010 mdl E Processor. For 5024 mdl 2 or 3, a 2502 mdl A2 with specify feature #9901 for 115 V AC, and #9046 for white color.

System/7 Summary: GA34-0002

Input Power: 115 V AC, 1-phase, 60 Hz.

Specify: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9901.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Print Belt: Specify one -- #9490 for 96-character belt, #9491 for 64-character belt, or #9492 for 48-character belt. [Not on model 2]

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
5024	1	\$ 578	\$ 492	\$18,040	\$107.00
	2	330	281	10,340	20.00
	3	768	654	22,500	114.00

Plan Offering: Plan B Warranty: B Maintenance: D
Purchase Option: 55% Useful Life Category: 2 Per Call: 2
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Changes from Model 1 or Model 2 to Model 3 are field installable. No other model changes can be made.

5024 Model 1 to Model 3 \$ 4,460
5024 Model 2 to Model 3 \$12,160

ACCESSORIES

FORMS STAND (#4450). Permits placement of continuous forms (out of carton) on the stand above floor level and provides for forms stacking after printing. This stand or equivalent is required for proper operation of the 5024 mdl 1 or 3. **Field Installation:** Yes.

ADDITIONAL PRINT BELT (#5550, 5551, 5552). Permits the customer to obtain more than one character set print belt for various applications. Order #5550 for 96-character belt, #5551 for 64-character print belt, #5552 for 48-character print belt. 48 character belt utilizes a character set with =, (and) rather than €, % and , respectively. **Field Installation:** Yes.

Special Feature Prices:	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
Forms Stand #4450		Purchase Only	\$ 51	NC
Additional Print Belt,				
96-character	5550	Purchase Only	170	---
64-character	5551	Purchase Only	170	---
48-character	5552	Purchase Only	170	---

5026 ENCLOSURE

Purpose: To provide housing and power for System/7 Processor and Input/Output Modules.

- Model A2** 2 Position ... for a Processor Module and one I/O Module.
- Model C3** 3 Position ... for a Processor Module and two I/O Modules.
- Model C6** 6 Position ... for a Processor Module and five I/O Modules.
- Model D3** 3 Position Extension ... 3 additional I/O Module locations with C3 or C6.
- Model D6** 6 Position Extension ... 6 additional I/O Module locations with C3 or C6.

Model D3 or D6 is cable attached to model C3 or C6 and may be located up to 200 feet from the model C3 or C6.

Highlights: Provides housing for the Processor Module and all Input/Output Modules. Also included are the necessary power supplies (see RPQ for power restrictions on 3340 Attachment) and interface connections for all modules. The Processor Module must be located in the first module location of A2, C3 or C6 models. I/O Modules may be housed in any of the remaining module locations, except Module 5998-TO 1 must be located in module position 2 and if it is installed a 5022 module may not be located in module position 1. The D3 or D6 model may be located up to 200 feet from the C3 or C6 model. An Internal Air Isolation feature (not available on model A2) seals the enclosure and prevents the outside air from entering into the enclosure. Internal air is filtered through an activated carbon filtration system. Heat within the enclosure is dissipated through an air-to-air heat exchanger. This feature allows the System/7 to be used in environments where airborne elements might harm the electronic circuitry. Since this feature is not available on model A2 enclosures, in environments where there is a possibility of existence of contaminants, a C3 or C6 model must be used.

An "Early Warning" corrosion detector card is installed as a standard item in every System/7 enclosure. This card is specifically designed to be sensitive to airborne contaminants. Inspection of this card gives an early warning so that appropriate action for protection of the system may be taken.

A Power Failure Detect feature (#5731) provides an early indication of imminent power failure so that the program can bring the system to an orderly halt. When power is restored, the auto restart function of the system can provide automatic program load from either the Operator Station or host teleprocessing link. The processor console switch must be appropriately set.

A thermal detector in the enclosure generates a warning interrupt if the internal temperature of the enclosure rises above a specified operating level. The thermal detector causes a power shutdown after the warning signal is generated. The time between the thermal interrupt and the power shutdown could be used by the program to cause an orderly halt of the operation.

PREREQUISITE: Models D3 and D6 require a Dx Enclosure Attachment (#3715) feature in models C3 and C6 enclosures.

Module Locations:

C3	C6		D3	D6	
0	0	3	6	6	9
1	1	4	7	7	10
2	2	5	8	8	11

Front view

System/7 Summary: GA34-0002

Specify: [1] Voltage (AC, 60 Hz):
 #9902 for 208 V, 1-phase (mdls A2, C3, D3 only),
 #9903 for 208 V, 3-phase (mdls C3, C6, D3, D6 only),
 #9904 for 230 V, 1-phase (mdls A2, C3, D3 only),
 #9905 for 230 V, 3-phase (mdls C3, C6, D3, D6 only).
 NOTE: When options are available, use of 3-phase power is recommended. This would eliminate the need for rewiring for system expansion to models C6 or D6.

- [2] Power: Specify one -- #9490 for 5010 A and B models ... #9491 for 5010 E models.
- [3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- [4] Storage Power Addition (#7401) required for systems with more than 8K of storage (5010 A and B models only) ... see "Special Features."

- [5] Proposal of all 5026 Enclosures must be in accordance with procedures outlined at the end of this section.
- [6] Kickstrips: #9431, if needed. When kickstrips are installed, the open area underneath the machine is enclosed. This may be inconvenient for the operator or for signal wiring. Use of kickstrips is recommended only when the physical appearance of the system is of prime importance.
- [7] Cables: For System/7 external cables for 5026 mdl D3 and D6, supplied by IBM, use cable order form number Z120-2368.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
5026	A2	\$ 128	\$ 3,010	\$35.00
	C3	296	6,510	41.50
	C6	441	9,190	67.50
	D3	296	6,510	54.00
	D6	441	9,190	80.50

Plan Offering: Plan B Warranty: B Maintenance: B
 Purchase Option: 45% Useful Life Category: 2 Per Call: 2

Model Changes: Changes from C3 to C6 and from D3 to D6 are field installable. No other model changes can be made.

MODEL UPGRADE PURCHASE PRICES (There are no additional installation charges)

- From Model C3 to Model C6 \$4,200
- From Model D3 to Model D6 \$4,200

SPECIAL FEATURES

Dx ENCLOSURE ATTACHMENT (#3715). [mdls C3 and C6 only] This feature provides for the connection of the Enclosure models D3 or D6 to Enclosure models C3 or C6. **Maximum:** One #3715 per system. **Field Installation:** Yes.

INTERNAL AIR ISOLATION 3 (#4621). (not with 5998-TO 1) [mdls C3 and D3 only] This feature seals the model C3 or D3 enclosure and provides an air-to-air heat exchanger for dissipation of the internal heat. An activated carbon filtration system filters the internal air. The feature isolates the inside air from the outside and is used in severe industrial environments where gaseous contaminants harmful to electronic circuitry exist. **Limitations:** Proposals are not to recommend the IA feature unless the FE Installation Planning Representative has determined that the feature is required, or the internal system detector indicates measures are necessary to protect an installed system. **Maximum:** One per C3 or D3 enclosure. **Field Installation:** Yes.

INTERNAL AIR ISOLATION 6 (#4622). (not with 5998-TO 1) [mdls C6 and D6 only] This feature is identical to #4621 and is provided for model C6 or D6 enclosures. **Maximum:** One per C6 or D6 enclosure. **Field Installation:** Yes.

POWER FAILURE DETECT (#5731). Provides a signal to the system when the input AC voltage falls below a safe level. This signal is used by the program to bring the system to an orderly halt. This feature also provides auto restart which can automatically restart system power when input AC power is restored. **Maximum:** One per enclosure. **Field Installation:** Yes.

STORAGE POWER ADDITION (#7401). [mdls A2, C3 and C6 only] Provides a power supply for the 5010 Processor Module models A and B only, with storage in excess of 8K words. **Maximum:** One per system. **Field Installation:** Yes.

Special Feature Prices:		MAC/ MRC	Purchase	MMMC
Dx Enclosure Attachment	#3715	\$ 42	\$ 908	\$ 5.50
Internal Air Isolation 3	4621	55	1,465	15.50
Internal Air Isolation 6	4622	76	1,955	32.50
Power Failure Detect	5731	63	1,305	1.00
Storage Power Addition	7401	17	417	1.50

5028 OPERATOR STATION

Purpose: To provide an operator and computer input/output device for System/7.

Highlights: The 5028 Operator Station provides a keyboard, printer, paper tape punch, and paper tape reader. It is attached via a multi-wire cable to a System/7 Processor Module. The printer, paper tape reader, and paper tape punch operate at a speed of 10 characters per second. Transmission code is 7 level ASCII, with the 8th level for "even parity." The paper tape reader and punch can also read and punch 8-bit binary code without parity. The recording tape is one inch wide and may be paper (Part No.s 304469 or 426362), or lubricated, non-metallic plastic. A printing line is 72 characters with 6 lines per inch. Only single part paper may be used for printing.

LOCAL REMOTE switches provide for offline and online operations. The 5028 is used for program loading, data input/output, and paper tape preparation.

The 5028 Operator Station must be available for system maintenance in all configurations. An Operator Station may be shared among several System/7s, except those with 5998-TO 1. The customer must attach the Operator Station to the system requiring maintenance prior to the arrival of a customer engineer. Delays due to the relocation of an Operator Station from one system to another may result in extended down time. Before ordering a system without an Operator Station, the customer must realize the above condition as well as the procedure for disconnecting an Operator Station which requires these steps: stop system; power off Operator Station; disconnect Operator Station; start system.

PREREQUISITE: 5010 Processor Module.

System/7 Summary: GA34-0002

Input Power: 115 V AC, 1-phase, 60 Hz.

Specify: Cables. Use cable order form Z120-2368.

Supplies: A black ribbon, IBM Part No. 1136260 or equivalent, is required.

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yr	Purchase	MMMC
5028	1	\$ 179	\$ 152	\$1,940	\$69.00

Plan Offering: Plan B Warranty: B Maintenance: C
 Purchase Option: 50% Useful Life Category: 2 Per Call: 2
 Termination Charge Months: 5 Termination Charge Percent: 25%
 Upper Limit Percent: 0%

**5029 MDL 1 ATTACHMENT ACCESSORIES
FOR SYSTEM/7 [Purchase only]**

Purpose: 5029 mdl 1 is an accessory control number used for ordering components and Termination Cards for connection of customer signal wires to the System/7 interface. 5029 is not a machine in itself.

Specify 5029 in the machine field only once per system for all Termination Cards and components. Features on 5029 cannot be ordered. Accessories in the 5029 are for purchase only and no maintenance service is available. Normal parts warranty of 3 months applies to the accessories.

Highlights: 5029 Attachment Accessories provide a number of cards and components used for connection of customer signals to the System/7 as well as conditioning and filtering of signals. Standard circuits are offered for each type of sensor I/O point. Special circuits can be constructed by the customer on the Custom Cards. Termination Cards provides a screw-down terminal for connection of customer wires. This feature offers several advantages, such as (a) the customer can wire his signals to the cards prior to system arrival at the site, thereby reducing the installation time ... (b) when a system is upgraded, rewiring is merely a matter of unplugging the cards from the old module and plugging them into the new module ... (c) sensor-based points may be quickly disconnected for trouble shooting.

System/7 Summary: GA34-0002.

ACCESSORIES

Table 1, below, shows a summary of the requirements for the Attachment Accessories.

AI CUSTOM (#1110). This card contains screw terminals for customer connection of four analog input signals to Multiplexer/MR16 (#5247 in 5014), Multiplexer/MD16 (#5245 in 5014), Multiplexer/MR4 (#5246 in 5012), Multiplexer/MS16 (#5249 in 5014), or Multiplexer/MS4 (#5248 in 5012). Solder terminals are provided for the customer addition of networks to each point to complete the connection. This card should be used where the customer desires to construct analog input networks of his own design. **Limitations:** Use of this card can affect accuracy and repeatability of the analog to digital conversion of analog signals connected to it.

AI/MR FILTER (#1113). This card contains filter circuits and screw terminals for customer connection of four analog input signals to Multiplexer/MR16 (#5247 in 5014), Multiplexer/MD16 (#5245 in 5014), or Multiplexer/MR4 (#5246 in 5012). Current resistors can be added to the terminals. No provision is made to add other components.

AI/MR RBT/FILTER (#1114). This card contains one resistance bulb thermometer circuit plus three filter circuits for customer connection of three analog input signals to Multiplexer/MR16 (#5247 in 5014), Multiplexer/MD16 (#5245 in 5014), or Multiplexer/MR4 (#5246 in 5012). The resistance bulb circuit output can be used to calculate a reference junction temperature. Current resistors cannot be added to the terminals. No provision is made to add components. **Maximum:** 32 per Temperature Reference Attach. **Prerequisite:** Temperature Reference Attach (#7830) in 5012 or 5014.

AI/MS CONNECTOR (#1122). This card contains circuits and screw terminals for customer connection of four analog input signals to Multiplexer/MS16 (#5249 in 5014), or Multiplexer/MS4 (#5248 in 5012). No filter circuits are provided. Current resistors can be added to the terminals. No provision is made to add other components. **Limitation:** Use of this card can affect accuracy and repeatability of the analog to digital conversion of analog signals connected to it.

AI/MS NON-POLARIZED FILTER (#1121). This card contains filter circuits and screw terminals for customer connection of four analog input signals to Multiplexer/MS16 (#5249 in 5014), or Multiplexer/MS4 (#5248 in 5012). The filter circuit is a non-polarized network ... can accept both positive and negative signals. Current resistors can be added to the terminals. No provision is made to add other components.

AI/MS POLARIZED FILTER (#1124). This card is identical to the AI/MS Non-Polarized Filter (#1121), except the filter circuit is polarized ... accepts only a single polarized signal.

AI/MS RBT/NON-POLARIZED FILTER (#1123). This card contains one resistance bulb thermometer circuit plus three filter circuits for customer connection of three analog input signals to Multiplexer/MS16 (#5249 in 5014) or Multiplexer/MS4 (#5248 in 5012). The resistance bulb thermometer circuit output can be used to calculate a reference junction temperature. The filter circuit is a non-polarized network ... can accept both positive and negative signals. Current resistors cannot be added to the terminals. No provision is made to add other components. **Maximum:** 32 per Temperature Reference Attach. **Prerequisite:** Temperature Refer-

ence Attach (#7830) in 5012 or 5014.

CAPACITOR NON-POLARIZED 10UF (#1570). A special capacitor used to construct the network on the AI/MS Non-Polarized Filter (#1121) termination card. This 10 microfarad, 35 volt, non-polarized capacitor has very low dielectric absorption, low leakage and small physical size.

CONNECTOR, 3-PIN (#1240). This cable plug is used to connect the customer analog output signal wires to the analog output points on the 5012. One is required for each Analog Output Point (#1246 in 5012). Installation of wires on the connector is the customer's responsibility.

CONNECTOR, 4-PIN (#8185). This plug is used to connect the 2790 loop transmission lines to the 2790 Control (#8195) in the 5012. One is required for the 2790 Control (#8195) in 5012. This plug is also used to connect to the external synchronization control on the 5012 and 5014. One is required for each 5014 and one for each 5012 with Analog Input Control Mod B (#1232) or Analog Input Control Mod C (#1213). Installation of wires on the connector is a customer responsibility.

CURRENT RESISTOR 4-20 MA (#1670). This precision resistor can be connected across analog input terminals to act as a current shunt. It converts 4 to 20 milliamperes to 128 to 640 millivolts. **Limitation:** Cannot be used on analog input termination cards AI/MR RBT/Filter (#1114) or AI/MS RBT/Non-Polarized Filter (#1123).

CURRENT RESISTOR 10-50 MA (#1671). This precision resistor can be connected across analog input terminals to act as a current shunt. It converts 10 to 50 milliamperes to 128 to 640 millivolts. **Limitation:** Cannot be used on analog input termination cards AI/MR RBT/Filter (#1114) or AI/MS RBT/Non-Polarized Filter (#1123).

DI CONTACT SENSE (#3281). This card contains contact sensing circuits and screw terminals for customer connection of eight digital input signals to Digital Input Group (#3289 in 5012 and 5013) or Process Interrupt (#5710 in 5012 or 5013). One side of each contact sense point is connected to a common 48 volts DC to provide contact sensing capability. No provision is made to add components.

DI CONTACT SENSE NON-ISOLATED (#3280). This card contains contact sensing circuits and screw terminals for customer connection of eight digital input signals to Digital Input Non-Isolated (#3292) in the 5012 or 5013. One side of each contact sense point is connected to a common 48 volt DC to provide contact sensing capability. No provision is made to add components.

DI CUSTOM (#3282). This card contains screw terminals for customer connection of eight digital input signals to Digital Input Group (#3289 in 5012 or 5013), Digital Input Non-Isolated (#3292 in 5012 or 5013), or Process Interrupt (#5710 in 5012 or 5013). Solder terminals are provided for customer addition of networks to each point to complete the connection. This card should be used where the customer desires to use digital input networks of his own design.

DI VOLTAGE SENSE (#3283). This card contains circuits and screw terminals for customer connection of eight digital input signals to Digital Input Group (#3289 in 5012 or 5013) or Process Interrupt (#5710 in 5012 or 5013). No provision is made to add components on this card.

DO CONNECTOR (#3410). This card contains screw terminals for direct customer connection of eight digital output signals to DO Low Power Group (#3421 in 5012 or 5013), DO Medium Power Group (#3422 in 5012 or 5013), DO Medium Power Non-Isolated (#3424 in 5012 or 5013), or DO Contact Group (#3420 in 5012 or 5013). No provision is made to add components.

DO CUSTOM (#3430). This card contains screw terminals for customer connection of eight digital output signals to DO Low Power Group (#3421 in 5012 or 5013), DO Medium Power Group (#3422 in 5012 or 5013), DO Medium Power Non-Isolated (#3424 in 5012 or 5013), or DO Contact Group (#3420 in 5012 or 5013). Solder terminals are provided for the customer addition of networks to each point.

VOLTAGE CHECK (#1184). This card provides seven voltage outputs of either polarity suitable for use as an analog input checking source. The card can be plugged into a specific socket and wired to one analog input point at a time to be used as a program addressable voltage check source. The following voltage are provided: 4 volts, 512 millivolts, 128 millivolts, 64 millivolts, 32 millivolts, 15 millivolts, and 5 millivolts.

5029 Mdl 1 Attachment Accessories for System/7 (cont'd)

Accessories Prices:	Feature	Purchase
AI Custom	#1110	\$ 30.00
AI/MR Filter	1113	28.00
AI/MR RBT/Filter	1114	144.00
AI/MS Connector	1122	35.00
AI/MS Non-Polarized Filter	1121	71.00
AI/MS Polarized Filter	1124	52.00
AI/MS RBT/Non-Polarized Filter	1123	217.00
Capacitor Non-Polarized 10UF	1570	7.00
Connector, 3-Pin	1240	3.50
Connector, 4-Pin	8185	4.00
Current Resistor 4-20 MA	1670	4.00
Current Resistor 10-50 MA	1671	2.50
DI Contact Sense	3281	39.00
DI Contact Sense Non-Isolated	3280	68.00
DI Custom	3282	39.00
DI Voltage Sense	3283	37.00
DO Connector	3410	28.00
DO Custom	3430	36.00
Voltage Check Card	1184	70.00

Note: Specifications stated in the sales manual are a generalized description of the system features. Detail specifications for System/7 Sensor I/O features must be quoted or proposed from the latest revision of the IBM System/7 Installation Manual - Physical Planning, GA34-0004.

TABLE 1

5029 ATTACHMENT ACCESSORIES FOR SYSTEM/7

Components Required to Connect to each Sensor Input/Output Feature

		Sensor Input/Output Features															
		Analog Input (AI)				External Sync	Analog Output (AO)	Digital Input (DI)		Digital Output (DO)		2790 Control					
		Multiplexer/MR 4 Group Relay 4 Points per Group # 5246 in 5012 mdl A1	Multiplexer/MD16 Group Relay 16 Points per Group # 5245 in 5014 mdl D1, E1	Multiplexer/MR16 Group Relay 16 Points per Group # 5247 in 5014 mdl B1, D1, E1, E2	Multiplexer/MS4 Group Solid State 4 Points per Group # 5248 in 5012 mdl A1	Multiplexer/MS16 Group Solid State 16 Points per Group # 5249 in 5014 mdl C1	External Synchronization Control for AI Standard on: 5014 all Models 5012 with Analog Input	Analog Output Point 1 Point per Group # 1246 in 5012 mdl A1	Digital Input Group (Isolated) 16 Points per Group # 3289 in 5012 or 5013, mdl A1	Digital Input Group (Non-Isolated) 16 Points per Group # 3292 in 5012 or 5013 mdl A1	Contact Output Group 16 Points per Group # 3420 in 5012 or 5013, mdl A1	Medium Power Group (Isolated) 16 Points per Group # 3422 in 5012 or 5013, mdl A1	Medium Power Group (Non-Isolated) 16 Points per Group # 3424 in 5012 or 5013, mdl A1	Low Power Group 16 Points per Group # 3421 in 5012 or 5013, mdl A1	2790 Control 4 Loops per System # 8195 in 5012 or 5013, mdl A1		
Components	Analog Input (AI) Termination Cards	AI/MR Filter (#1113)	1	4	4												
		AI/MR RBT/Filter (#1114)	1	4	4												
		AI Custom (#1110)	1	4	4	1	4										
		AI/MS Connector (#1122)				1	4										
		AI/MS Non-Polarized Filter (#1121)				1	4										
		AI/MS Polarized (#1124)				1	4										
		AI/MS RBT/Non-Polarized Filter (#1123)				1	4										
		Total - Maximum Cards per AI Group	1	4	4	1	4										
	AI Current Resistors	Current Resistor 4 - 20 MA (#1670)	4	16	16	4	16										
		Current Resistor 10 - 50 MA (#1671)	4	16	16	4	16										
		Total Maximum Resistors per AI Group	4	16	16	4	16										
	DI Termination Cards	DI Contact Sense (#3281)							2								
		DI Contact Sense Non-Isolated (#3280)								2							
		DI Voltage Sense (#3283)							2								
		DI Custom (#3282)							2	2							
		Total Maximum Cards per DI Group							2	2							
	DO Termination Cards	DO Connector (#3410)									2	2	2	2	2		
		DO Custom (#3430)									2	2	2	2	2		
		Total Maximum Cards per DO Group									2	2	2	2	2		
	Connectors	Connector, 3 Pin (#1240)							1 per Point								
Connector, 4 Pin (#8185)								1 per I/O Module								1 per Loop	
		AI Voltage Check Card (#1184) is available to check AI - maximum, one per 5012 with #1213 or #1232; four per 5014. Capacitor Non-Polarized 10 UF (#1570) is available to construct custom networks.															



IBM 5203 PRINTER

Purpose: The 5203 Printer mdl 3 is used for printed output for a S/370 mdl 115.

For description and use of the 5203 mdls 1, 2 and 3 with S/3, see GSD manual.

Model 3 300 lpm rated speed with a 48 character set.

Model Changes: Field Installable.

Highlights: The standard unit has 96 print positions ... can be expanded to 120 or 132 positions. See "Special Features." Vertical spacing is 6 or 8 lines/inch, under operator control. Horizontal spacing is 10 characters to the inch.

One interchangeable train cartridge is supplied with the 5203 mdl 3 ... see "Specify." Additional interchangeable train cartridges are available ... see "Special Features."

When Universal Character Set Control (#9848) is installed on the 3115, and the 5203 is equipped with Universal Character Set Attachment (#8639), interchangeable train cartridges containing character sets from 49 to 120 characters can be used. Use of such character sets may result in reduced throughput, depending upon the character set being used and the text being printed. See 5203 Printer in "Type Catalog" for details.

Printed format is controlled by the stored program. Continuous marginally punched forms are fed by a forms tractor. Maximum forms dimensions are 16-3/4" wide and 14" long (edge-to-edge). Minimum forms dimensions are 3-7/8" wide and 3" long (edge-to-edge). Paper eject speed is 16.67"/second at 6 lines/inch ... 12"/second at 8 lines/inch.

Limitations: [1] Only marginally punched, pin fed, continuous forms can be used on the 5203. No staples are permitted in the print train area.

[2] No representations or commitments as to readability of 5203 printing by optical character recognition equipment shall be made.

[3] Print quality and forms feeding varies with paper specifications, ribbon and number of copies. Multiple copy forms of more than four parts and forms with a first part heavier than 13-pounds should be tested under operating conditions to determine that results are satisfactory for the user's application.

[4] Forms sets which gave satisfactory results on 5203 mdls 1 and 2 may show a decrease in print quality when used on a 5203 mdl 3.

[5] For S/370 mdl 115, the 5203 Printer mdl 3 requires 120 print positions if this is the only printer on the system.

Maximum: Only one 5203 mdl 3 can be attached to a S/370 mdl 115.

Supplies: ribbons

Prerequisites: For S/370 mdl 115 -- an Integrated 3203/5203 Printer Prerequisite (#4653) and Integrated 5203 Printer Mdl 3 Attachment (#4690) on the 3115.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 60 Hz): #9903 for 208 V or #9905 for 230 V. Must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Print Train Arrangement: See 5203 Printer in "Type Catalog" for arrangements and required feature #s.

[4] System Attachment Adapter: #9223 for attachment to S/370 mdl 115. Field Installable.

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC
	5203	3	\$ 488	\$10,880 \$158

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: I/O Unit (Online) Warranty: B Maintenance: C
Purchase Option: 40% Useful Life Category: 2 Per Call: 2

SPECIAL FEATURES

INTERCHANGEABLE TRAIN CARTRIDGE, ADD'L (#4740). An additional operator changeable train cartridge containing from 48 to 120 different characters. See "Type Catalog" for feature numbers of available arrangements. **Prerequisites:** If any character set containing more than 48 different characters is to be used, Universal Character Set Attachment (#8639) is required on the 5203. In addition, Universal Character Set Control (#9848) is required on the 3115 Processing Unit.

PRINT POSITIONS, 24 ADDITIONAL (#5558). Increases the number of print positions from 96 to 120.

PRINT POSITIONS, 12 ADDITIONAL (#5559). [For field installation only ... for plant installation of 132 print positions, order #5560 below] Increases the number of print positions from 120 to 132. **Prerequisite:** Print Positions, 24 Add'l (#5558) on the 5203.

PRINT POSITIONS, 36 ADDITIONAL (#5560). Increases the number of print positions from 96 to 132.

UNIVERSAL CHARACTER SET ATTACHMENT (#8639). Required if any Interchangeable Train Cartridge with more than 48 different characters is to be used. See 5203 Printer in "Type Catalog" for details. **Prerequisite:** Universal Character Set Control (#9848) on the 3115.

Special Feature Prices:	MAC/ MRC	Purchase	MMMC	FIC
Interchangeable Train Cartridge, Add'l	#4740	\$123	\$2,145	\$40.50 **
Print Positions, 24 Add'l	5558	59	1,180	2.50 \$205
Print Positions, 12 Add'l	5559	29	587	NC 189
Print Positions, 36 Add'l	5560	88	1,750	2.50 205
Universal Char Set Attach	8639	10	236	1.50 162

** Installation by IBM is not normally required. However, if assistance is required, charges will be made on a Time and Material basis.



IBM 5213 PRINTER

Purpose: Optional console printer for the S/370 mdl 115 (5213 mdl 1 only) or S/370 mdl 125 (5213 mdl 1 only).

For description and use of the 5213 mdl 1, 2 or 3 with the System/3, see GSD manual.

Model 1 Has a pin feed platen.

Model Changes: Model 1 to Model 2 -- requires a capacity replacement of machine.

Highlights: Prints serially at a rate of 85 cps. The maximum print line is 132 positions at 10 characters/inch spacing. Line spacing is 6 lines/inch. Electronic tab is provided under program control. EBCDIC coded matrix characters are formed by 7 vertical wires, each printing a dot in up to 4 of 7 possible positions. The 26 letters and 10 digits can be printed; the following special characters can also be printed:

& @ # ? * \$ % . ; : ' () _ + - * / † = ≠ < > | ~

Use of the "underscore" in conjunction with another character will overprint the lowest matrix dot forming that character and is not recommended. Refer to SRL GA24-3488 for form design considerations and limitations.

Model 1 -- has a pin feed platen, which feeds marginally punched continuous forms 13-7/8" wide (hole-to-hole), provides single space forms indexing under program control, and has high speed tab left. Up to 6-part forms can be printed, with a maximum thickness of .018" (for optimum feeding and stacking, no more than 3 parts are recommended). Forms length can be 3" to 14" in increments of 1/6". Card stock continuous forms are not recommended. An optional forms stand stacker is available ... see "Accessories" below.

Performance Considerations -- an analysis of each document type to be printed is necessary to find actual throughput of a serial printer. When used with dedicated printing jobs, throughput depends upon the ratio (R) of lines printed per page to the maximum number of lines available per page and upon the number of character positions (C) in the printed line. Lines printed per minute (LPM) can be approximated using formulas:

$$\text{For Model 1 ... LPM} = \frac{2700 R}{RC + 5} \text{ where C is average number of character positions.}$$

EXAMPLE: For Model 1. If 22 of 66 lines on a page are printed, R = 1/3. Assume a maximum line length of 75 character positions.

$$\text{Then: LPM} = \frac{2700 (1/3)}{1/3(75) + 5} = 30 \text{ (approximate throughput)}$$

Prerequisites: An integrated 5213 Printer mdl 1 Attachment (#4692) on the 3115 or 3125 Processing Unit.

Limitations: Only one printer can be attached to a 3115 or 3125 Processing Unit.

Supplies: Serial #12000 and below (mdl 1) -- a black ribbon, IBM Part No. 1136906 or equivalent, is recommended. Serial #12001 and above (mdl 1) -- a black ribbon, IBM Part No. 1136970 or equivalent, is recommended

Bibliography: GC20-8080

Specify: Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

PRICES:	Mdl	MAC/MRC	Purchase	MMMC	
	5213	1	\$ 179	\$4,115	\$ 66

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Base Unit (meter on 3115 or 3125) Maintenance: B
Purchase Option: 40% Useful Life Category: 2 Per Call: 2
Warranty: B

Accessories: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND STACKER (#4450). [Mdl 1 only] Permits placement of continuous forms (out of carton) on the stand above floor level and provides for continuous forms stacking after printing.

IBM 5424 MULTI-FUNCTION CARD UNIT

Purpose: A multi-function card input/output unit for attachment to a 4331 Processor. Uses the 96-column card.

Model	Speed (Read/Punch/Print)
A1	250/60/60* cpm
A2	500/120/120* cpm

* **Print Speed:** Is at the maximum rate of 60 or 120 cards per minute on any or all of the first three lines. Printing on the fourth (lower) line will cause reduction in throughput regardless of whether or not printing occurs on any or all of the first three lines. Resultant throughput is 48 cpm for a model A1 and 96 cpm for a model A2.

Highlights: Provides the combined functions of a card reader, punch, collator and interpreter in one unit. Permits collating, gangpunching, reproducing, summary punching, punching of calculated results, printing, and classifying of cards in a single pass of the cards. Card sorting is also possible using a multiple pass method under program control.

Input Section: Separate primary and secondary card hoppers, each with a 2,000 card capacity, feed cards independently to a common read station and on into separate wait stations. Depending upon the model, rated serial reading is at 250 or 500 cards per minute from either hopper. The common reading unit is checked for proper functioning on each read cycle. The card code read is 6 rows consisting of B, A, 8, 4, 2, 1 punches representing a 64-character set.

Output Section: From separate wait stations, cards are fed to a common punch station, through the punch and cornering stations to the print station, where up to 4 lines with up to 32 characters per line can be printed on the card. Line designation is determined by the stored program. Characters represented are the standard 64 character set corresponding to the 96-column card code. Printing is by engraved typewheel. Cards are then selected into any of the 4 stackers, each with a 600-card capacity. Depending upon the model, rated serial punching is at 60 or 120 cards/minute.

Multi-function: With the ability to move cards from either hopper under independent control to the punching station and with complete stacker selection flexibility, the common card functions of collating, reproducing, gangpunching, summary punching, and selective stacking can be accomplished.

Maximum: One 5424 mdl A1 or A2 can be attached to an 4331 Processor.

Prerequisites: A 5424 Attachment (#3901) on the 4331 ... 4331 Attachment (#6510) on the 5424 itself. See "Special Features" below.

Limitations:

- Detailed disclosure specifications describing the 96-column card are available from the IBM Corp., Commercial Development Office, Armonk, New York. Card configurations or card stocks which do not conform to these specifications may result in unsatisfactory machine performance. The configurations available from IBM
- OCR type font for use with current line IBM Optical Character Reading Equipment is not available.

Supplies: The 5424 uses a cassette ribbon replaceable by the customer

Bibliography: Reference Manual, GA21-9167 (Available 3/79)

SPECIFY

- Voltage** (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V. Must be consistent with system voltage.
- Color:** #9066 for pearl white ... must be specified.

PRICES:	Mdl	MAC/MRC	Purchase	MMMC	
	5424	A1	\$376	\$7,810	\$185
		A2	565	10,340	266

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: C Per Call: 2 Warranty: B
Purchase Option: 35% Useful Life Category: 2

Model Changes: Field installable.

† No Educational Allowance:



5424 Multi-Function Card Unit (cont'd)
SPECIAL FEATURES

4331 ATTACHMENT (#6510). To attach a 5424 mdl A1 or A2 to an 4331 Processor. **Prerequisite:** 5424 Attachment (#3901) on the 4331. **Maximum;** One. **Field Installation:** Not recommended.

Special Feature Prices		MAC/ MRC	Purchase	MMMC
4331 Attachment	#6510	\$60	\$2,670	\$6

PRICES:	Mdl	MAC/ MRC	ETP/ MLC 2 yrs	Purchase	MMMC
5425	A1	\$748	\$637	\$15,560	\$215
	A2	974	829	18,980	424

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: 1/O Unit (Online) Warranty: B Maintenance: C
Purchase Option: 35% Useful Life Category: 2 Per Call: 2
Model/Feature Additional Charge in lieu of AU Charge: 10%
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

IBM 5425 MULTI-FUNCTION CARD UNIT

Purpose: A multi-function card input/output unit for a S/370 mdl 115, 125 ... uses the 96-column card.

Model Speed (Read/Punch/Print)

A1	250/60/60* cpm
A2	500/120/120* cpm

Model Changes: Field installable.

Highlights: Provides the combined functions of a card reader, punch, collator and interpreter in one unit. Permits collating, gang-punching, reproducing, summary punching, punching of calculated results, printing, and classifying of cards in a single pass of the cards. Card sorting is also possible using a multiple pass method under program control.

Input Section -- separate primary and secondary card hoppers, each with a 2000-card capacity, feed cards independently to a common read station and on into separate wait stations. Depending upon the model, rated serial reading is at 250 or 500 cards/minute from either hopper. The common reading unit is checked for proper functioning on each read cycle. The card code read on both models is 8 rows of D, C, B, A, 8, 4, 2, 1 punches representing a 256-character set.

Output Section -- from separate wait stations, cards are fed to a common punch station, through the punch and cornering stations, to the print station, where up to 4 lines with up to 32 characters per line can be printed on the card. Line designation is determined by the stored program. Characters represented are the standard 64-character set corresponding to the 6-bit subset of the 96-column card code. Printing is by engraved typewheel. Cards are then selected into any one of 4 stackers, each with a 600-card capacity. Depending upon the model, rated serial punching is at 60 or 120 cards/minute.

Note: Punching is eight rows representing a 256-character set. Eight-row punching in columns 33-96 can overpunch print positions 65-128.

Multi-function -- with the ability to move cards from either hopper under independent control to the punching stations and with complete stacker selection flexibility, the common card functions of collating, reproducing, gangpunching, summary punching, and selective stacking can be accomplished.

* **Print Speed** -- is at the maximum rate of 60 or 120 cards/minute when printing on any or all of the first three lines. Printing on the fourth (lower) line will cause some reduction in throughput regardless of whether or not printing occurs on any or all of the first three lines. Resultant throughput is 48 cpm for mdl A1 and 96 cpm for mdl A2. Uses a cassette ribbon replaceable by the customer

Maximum: One 5425 mdl A1 or A2 can be attached to a S/370 mdl 115 or 125.

Prerequisites: An Integrated 5425 Attachment (#4695) with #9183 specified for mdl A1 or #9184 for mdl A2 on the 3115 or 3125.

Limitations: [1] Detailed disclosure specifications describing the 96-column card are available from the IBM Corp., Commercial Development Office, Armonk, New York. Card configurations or card stocks which do not conform to these specifications may result in unsatisfactory machine performance. The configurations available from IBM

[2] OCR type font for use with current line IBM optical character reading equipment is not available.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white ... must be consistent with 3115 or 3125.

[reverse side is blank]



5496 DATA RECORDER

Purpose: An operator oriented key entry unit used to create the 96-column card as well as verify data which has been previously recorded.

For use with System/3, 3740 System or 5320, see GSD manual.

Model 1 Rated card read speed 20 columns per second.

Model 2 Rated card speed 60 columns per second. Minus right adjust standard.

When equipped with a 2772/3741/5320 Attachment (#7850), the model 1 can be attached to a 2770 Data Communication System for transmission and punching of 96 column card data or can be attached to a 3741 Data Station/Programmable Work Station as an auxiliary card reader.

When equipped with a 3735 Attachment (#7801), the model 1 can be attached to a 3735 Programmable Buffered Terminal for transmissions, reading, and punching of 96-column card data.

Highlights: Buffered, key entry, punch and print areas ... 64-character keyboard ... auto skipping ... automatic duplicating at electronic speeds ... four program levels ... right adjust, size of field can be 96 columns ... field erase ... word erase ... record erase ... upper, lower and numeric shift control ... punches and prints at 20 columns per tier per second, equivalent to 60 characters per second ... engraved printing ... reading via photosensors ... backlighted, easy-to-read column indicator ... hopper and stacker capacity of 350 cards ... 410 square inch reading board work area ... rotational keyboard mobility ... auxiliary duplication is a standard operation ... feed check light indicates card misfeed or card jam ... stacker-full light.

Alphabetic, numeric and special character recording in cards can be key verified on the same machine.

Notches verified correct cards on trailing edge of card ... manually skipped columns verified as blanks ... programmed or manually keyed auto verified fields will be verified ... programmed skipped fields will not be verified for content ... right adjust fields are programmable for testing proper number of blanks inserted ... when an error is detected, keyboard locks and error light is lit ... depressing error reset unlocks keyboard ... after third try on column in error, memory is changed to reflect corrected data ... at end of corrected field, control reverts to first manual column of corrected field for reverification ... completion of proper verify routine allows blank cards to be manually inserted in hopper and repunch operation provides a corrected card with verify notch. Incorrect card will be stacked without notching. Proper card formatting will enhance throughput when verifying ... see Operator's Guide for details.

A cassette ribbon provides for rapid and easy operator installation

A card gauge is provided without additional charge with each Data Recorder.

Limitation: Detailed disclosure specifications describing the 96-column card are available from the IBM Corp., Commercial Development Office, Armonk, New York. Card configurations or card stocks which do not conform to these specifications may result in unsatisfactory machine performance. The configurations available from IBM

Manual: GA21-9086

Specify: [1] Voltage (115 V AC, 1-phase, 60 Hz, non-lock plug): #9881.

[2] When ordered as a component of a 2770 system, 2772/3741/5320 Attachment (#7850) is required ... see "Special Features."

[3] When ordered for attachment to a 3735 Programmable Buffered Terminal, 3735 Attachment (#7801) is required ... see "Special Features."

[4] When ordered for attachment to a 3741 Data Station/Programmable Work Station, 2772/3741/5320 Attachment (#7850) is required ... see "Special Features."

[5] Print Wheel Arrangement: Slash-zero is the standard numeric character. If a non-slash zero (0) is desired, specify #9490. See Type Catalog TC 1 for field installation charge.

PRICES	Mdl	MAC/ MRC	Purchase	MMMC
5496	1	\$203	\$4,005	\$59.50
	2	210	4,135	61.50

Plan Offering: Plan B Purchase Option: 40% Maintenance: C
Warranty: B Useful Life Category: 2 Per Call: 1

Model Changes: Model 1, with serial number 51221 or above, can be field upgraded to a Model 2.

SPECIAL FEATURES

8-BIT READ/PUNCH (#3666). [Model 1 only] Provides offline capability to punch special 8-bit coded characters in 96-column cards. Dependent on C/D-Bit switch setting, 5496 operates in either conventional System/3 6-bit mode or Special 8-bit mode. C/D switch ON permits 96-column cards punched with 256-character set to be read into storage for subsequent punchout (duplication) or manual keyboard entry of combined bit structures to generate special 8-bit coded characters. Keyboard generated characters utilize the multi-punch key method. 8-bit characters are not printable regardless of print switch setting.

In verify, the 8-bit mode of operation is inhibited regardless of the C/D-Bit switch setting, thereby preventing the verification of 8-bit coded characters.

Limitation: Cannot be installed on machines equipped with System/3 Model 6 Attachment (#7501), 3735 Attachment (#7801), or 2772/3741/5320 Attachment (#7850). **Field Installation:** Not recommended.

SELF-CHECKING NUMBER (#7061, 7062). Provides a means of verifying precoded alphanumeric information at the same time it is punched. Use of the feature requires that a check digit be added to the basic code number to produce a self-check number. The check digit is always placed in the units position of a self-checking number. More than one self-checking field can be checked per card. Correctly keyed cards are identified by "B" bit punch in the space adjacent to column 32 of tier 1. Self-checked fields bypassed via skip key depression will not carry the "B" bit punch in the specified location. One of two versions of the feature can be installed:

#7061 -- Modulus 10 ... factors (X2, X1 applied to alternate positions) are the arithmetic weighting factors used to arrive at the Modulus 10 check digit.

#7062 -- Modulus 11 ... factors (X7, X6, X5, X4, X3, X2 applied in that order) are the arithmetic weighting factors used to arrive at the Modulus 11 check digit.

Limitations: Neither version will operate on a left-based number ... Self-check numbers of Modulus 10 are not compatible with those of Modulus 11.

SYSTEM/3 MODEL 6/5230 ATTACHMENT (#7501). (Model 1 only) See GSD manual for details and prices.

3735 ATTACHMENT (#7801). [Model 1 only] To attach the 5496 to the 3735 Programmable Buffered Terminal. Operation is under switch control on the 5496. When in "Terminal" position, the 5496 may be used as either a card reader or a card punch for punching of 96-column card data at 20 columns per tier per second, equivalent to 60 characters per second ... when in manual position, the 5496 operates as a standard machine. **Maximum:** One. **Limitation:** Cannot be installed with 8-Bit Read/Punch (#3666). **Specify:** If desired, #9674 for ASCII print wheel and keytops ... otherwise standard print wheel and keytops will be supplied. [Available at time of manufacture only] **Prerequisite:** 5496 Attachment (#3950) on the 3735. **Note:** Signal cable and connector required to attach a 5496 to a 3735 are included with #3950 on the 3735.

2772/3741/5320 ATTACHMENT (#7850). [Model 1 only] Provides the ability to attach the 5496 Data Recorder mdl 1 to the 2772 Multi-Purpose Control Unit or the 3741 Data Station/Programmable Work Station or to any model 5320. Operation is under switch control on the 5496. When in manual position, the 5496 operates as a standard machine. When in "Terminal" position, the 5496 may be used either as a card reader or as a card punch for punching of 96-column card data. Attached online to the 2772, the 5496 reads, punches, or punch/prints card data at 20 columns per tier per second, equivalent to 60 characters per second. Attached online to the 3741, the 5496 reads, punches or punch/prints cards under control of the 3741 at the following rated speeds: Card reading - 21 cards per minute ... punch/print - 17 cards per minute. **Maximum:** One. **Limitation:** Cannot be installed with 8-Bit Read/Punch (#3666). [Available at time of manufacture only] **Specify:** When ordered as a component of a 2770 system, if desired, specify #9674 for ASCII print wheel and keytops ... otherwise standard print wheel and keytops will be supplied. **Prerequisite:** 5496 Attachment (#3970) on the 2772 or Data Recorder Attachment (#3200) on the 3741. **Note:** A signal cable and connector required to attach a 5496 to a 2772 is included in #3970 on the 2772. A 25 foot cable and connector required to attach a 5496 to a 3741 is included in #3200 on the 3741.



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5496 Data Recorder (cont'd)

Special Feature Prices	MAC/ MRC	Purchase	MMMC	FIC
8-Bit Read/Punch #3666	\$36	\$ 763	\$ 1.50	*
Self-Checking Number				
Modulus 10	7061	36	474	1.00 62
Modulus 11	7062	36	474	1.00 62
3735 Attachment	7801	55	1,160	4.50 PO
2772/3741/5320 Attach	7850	55	1,160	16.50 PO

SPECIAL FEATURE COMBINATIONS -- maximum combinations, indicated by "X", are shown in vertical columns.

	Model				
					2
8-Bit Read Punch #3666	X				
Self-Check Number Modulus 10 or 11 #7061/7062	X	X	X	X	X
System/3 Model 6 Attachment #7501		X			
3735 Attachment #7801			X		
2772/3741/5320 Attachment #7850				X	

* Not recommended for field installation.

7330 MAGNETIC TAPE UNIT

* The following specifications can be changed in the field.

- [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.
- [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

7770 AUDIO RESPONSE UNIT

Purpose: Provides a composed audio response to a digital inquiry from a 1001 Data Transmission Terminal, a telephone set, or other inquiry type terminal to a field-oriented S/360 mdl 22, 25, 30, 40, 50, 65, 75, 85, 195 or any S/370 Processor, or any 4300 Processor.

Highlights: Connects a data processing system with telephone and other inquiry type terminals through common carrier data sets over appropriate communication services. The 7770 receives an inquiry consisting of a series of coded characters from the inquiry terminal.

The inquiry message and the response message are transmitted between the 7770 and the processing unit character-by-character under program control. There is no limitation on the length of the inquiry or response message. Other major characteristics are:

Conversational Mode Operation under program control -- inquiry-answer sequence may be repeated any number of times within the same call without re-dialing the 7770 for each inquiry.

End of Inquiry (EOI) Character Recognition -- terminals such as the 1001 and 2730, and some push-button† dialing devices are capable of sending an EOI code which over-rides the 5-second inter-digital timeout used in the 7770. EOI Disable (#3540) can be ordered if the customer prefers that the EOI character on the push-button dialing device not be used for this function ... see "Special Features."

Primary Character Timeout Disconnect -- the 7770 answers an incoming call and waits 32 seconds for the first inquiry character to appear ... if it does not appear within this time, the call is abandoned, releasing the line for other service.

Inquiry characters are sent to the processor for translation and 99 codes are recognizable. For valid codes, see SRL GA27-2712.

Vocabulary -- a 32-word American English vocabulary is provided with the basic 7770. This can be expanded, in 16-word increments, to up to 128 words ... see "Special Features." One word of the vocabulary must be silence. Words may be specified by the customer according to message requirements. However, lengthy words must be split and will count as two words. See SRL GA27-2712 for guidance in word selection. For field vocabulary modifications, a replacement rotor will be shipped from the plant.

Input/Output Lines -- the basic unit handles up to four lines. The number of lines can be expanded in 4-line increments to 48 lines ... see "Special Features." Random inquiries on all input/output lines can be responded to simultaneously.

Configurations -- see the chart following "Special Features" for various combinations and number of input/output lines possible, and the special features required for them.

Communications -- the 7770 will operate with:

- (a) 1001 Data Transmission Terminal
- (b) Rotary dial telephone with associated push-button† manual dialing device for inquiry
- (c) Rotary dial telephone with associated push-button† type card dialer device for inquiry
- (d) Push-button† manual dial telephone††
- (e) Push-button† type card dialer telephone††
- (f) Rotary dial telephone†††
- (g) Rotary dial card dialer telephone†††

Communication Facilities -- operates in half-duplex mode over common carrier switched telephone network ... common carrier leased private line switched telephone service ... privately owned communication networks of voice bandwidth. When operating over a switched telephone network, telephone lines should be ordered for receive-only service, with make-busy capability in the data set.

Customer Responsibilities -- the customer must be advised that:

- [1] He is responsible for price quotations, installation and cost (initial and recurring) of common carrier equipment and services ...
- [2] Toll charges, if required for installation and maintenance of

the 7770, are to be paid by the customer ... [3] DP Marketing Representative must have customer obtain firm installation date for transmission service before processing the OC card ... [4] 7770 Vocabulary Specification Sheet must be completed and submitted at least 90 days prior to installation.

Programming Support -- programming systems support is covered under DOS and OS TCAM ... see "Programming."

Prerequisites: A control unit position on a system multiplexer channel ... one subchannel per input/output line.

S/360 mdl 25 -- Multiplexer Channel (#5248) ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 65, 75, 85, 195, or S/370 mdl 165, 168, 195 -- basic multiplexer channel of 2870 ... see 2870.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135, 135-3, 138, 145, 145-3, 148 -- multiplexer channel (standard) ... see 3135, 3135-3, 3138, 3145, 3145-3, 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature) ... see 3155, 3158.

3031, 3032 Processor -- byte multiplexer channel (one is standard) ... see 3031, 3032.

3033 Processor -- byte multiplexer channel (two are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (special feature) ... see 4331.

4341 Processor -- byte multiplexer channel (standard) ... see 4341.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Vocabulary Words: Submit completed Vocabulary Specification Sheet at least 90 days prior to installation ... for guidance in word selection, see SRLGA-27-2712.

[4] Isolation, Control Unit: May be required on units shipped prior to December 29, 1967 ... see "Special Features."

PRICES:	Mdl	MAC/ MRC	Purchase	MMMC	
	7770	3	\$1,295	\$48,370	\$52.50

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Metering: Assignable Unit Warranty: B Maintenance: B
Purchase Option: 55% Per Call: 3

SPECIAL FEATURES

EOI DISABLE (#3540). Allows EOI character of some push-button† dialer devices to be used as a data character instead of an EOI character. **Maximum:** One.

I/O LINE FRAME (#4668). Required if more than sixteen input/output lines are to be attached. **Maximum:** One.

I/O LINE EXPANDED (#4677). Provides for four additional input/output lines. **Maximum:** Eleven.

I/O LINE PANEL (#4679). An additional panel for eight input/output lines or portion thereof. One is required for each increment of eight lines, or portion thereof, added beyond the first eight lines. **Maximum:** Five.

ISOLATION, CONTROL UNIT (#4700). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that.] To turn power on or off on the 7770 without generating spurious signals. Thus a CPU, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements,

† For example: TOUCH-TONE, trademark of Bell System, or Touch-Calling, term used by General Telephone System.

†† Limited to areas served by telephone company central offices equipped for push-button dialing.

††† This is not a standard telephone company offering. If technically feasible for local conditions, it may be offered on a special assembly basis at discretion of a local telephone company using a telephone dictation trunk device suitably modified for this purpose.



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7770 Audio Response Unit (cont'd)

VOCABULARY WORDS, ADD'L (#8721). Each adds 16 vocabulary words. See SRL GA27-2712 for vocabulary word selection. When ordered for field installation, a replacement rotor is shipped from the plant. **Maximum:** Six #8721s, for a maximum of 128 words on a 7770.

Special Feature Prices:		MAC/ MRC	Purchase	MMMC	FIC
EOI Disable	#3540	NC	NC	NC	\$ 11
I/O Line Frame	4668	\$217	\$8,065	\$ 3.00	137
I/O Line Expanded	4677	190	7,065	16.50	344
I/O Line Panel	4679	81	3,020	2.50	119
Isolation, Control Unit	4700	NC	NC	NC	NC
Vocabulary Words, Add'l	8721	108	4,030	3.00	166

7770 CONFIGURATION CHART ... Maximum Feature Configuration Table.

Features Re- quired	Line Group Assignment											Max. No. Fea- tures Allowed	
	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	41-44		45-48
#4677		1	2	3	4	5	6	7	8	9	10	11	11
#4679			1		2		3		4		5		5
#4668					1								1



IBM 8101 STORAGE AND INPUT/OUTPUT UNIT

Purpose: Provides additional disk storage and device attachment capability for the 8100 Information System.

- Model A10** Device attachment capability
- Model A11** 29MB (29,327,360 bytes) - movable heads only and device attachments
- Model A13** 64MB (64,520,192 bytes) - movable heads only and device attachments

Maximum: Two per 8100 Information System with a 8130 Processor. One of the 8101s may be configured with Communication or Display/Printer features Type I or Type II. Four with an 8140 Processor. Two of the 8101s may be configured with Communication or Display/Printer features Type I or Type II. The maximum is one if the 8809 Magnetic Tape Unit mdl 1B is attached to the 8130 Processor or three if the 8809 Magnetic Tape Unit mdl 1B is attached to the 8140 Processor. See Table 2 for 8100 System maximums.

Highlights: The 8101 Storage and Input/Output Unit provides additional disk storage and device attachment capabilities for the 8100 Information System. The 8101 attaches to the I/O bus of the 8130 or 8140 Processor.

Disk storage for the 8101 mdls A11 and A13 is provided by a non-removable high speed direct access storage. Depending on the model selected, disk storage of up to 64 million bytes with movable heads is available. The disk storage operates at a data rate of 1,031,000 bytes per second. The average access time is 27 milliseconds with an average rotational delay of 9.6 milliseconds. Removable diskette storage of 1MB (985,088) is available and operates at up to 62K bytes per second data rate. The diskette drive can read/write in basic data exchange format on either the IBM Diskette 2D or the IBM Diskette Type 1.

The 8100 System can attach to any S/370 or 4300 Processor via the 3704/3705 for SNA/SDLC or BSC line control. The 8100 System can attach to the ICA of the S/370 mdl 115, 125, 135 or 138 processors for BSC line control. The IBM 8100 System can attach to the Communications Adapter of the 4331 Processor for BSC and/or SDLC line control.

The 8101 extends the capability of the 8100 Information System by providing for the attachment of a variety of input/output devices. These devices consist of displays, printers, magnetic tape, controllers and data collection units. The devices may be attached to the 8101 loops, data link attached loops, communication ports or direct attachment to the 8101.

Communication Attached devices -- Devices that can be attached to the communication ports of the 8101 are the -- 3276 Control Unit Display Station mdls 1, 2, 3, 4, 11, 12, 13, 14 with 3278 Display Station mdls 1, 2, 3, 4, 3287 Printer mdls 1, 2 and 3289 Line Printer mdls 1, 2 -- 3631 Plant Communication Controller mdls 1A, 1B -- 3632 Plant Communication Controller mdl 1A, 1B -- 8775 Display Terminal mdls 11 and 12 -- 3767 Communication Terminal mdls 1, 2, 3 -- 3842 Loop Control Unit -- 2741 Communications Terminal -- TTY 33/35 or equivalent -- non-IBM terminals conforming to 2780/3780 protocol -- 8130 Processor -- 8140 Processor -- 8101 Storage and Input/Output Unit.

Loop Attached Devices at 2400 or 9600 bps -- Devices that can be attached to a direct attached loop at 9600 bps or data link attached loop at 2400 bps are the -- 3287 Printer mdls 11, 12 -- 3289 Printer mdl 3 with 3501 Card Reader and via the 3782 Card Attachment Unit the 3521 Card Punch and 2502 Card Reader mdl A1 (see Note 1) -- 3276 Control Unit Display Station mdls 11, 12, 13, 14 with 3278 Display Station mdls 1, 2, 3, 4, 3287 Printer mdls 1, 2, 3289 Line Printer mdls 1, 2 -- 8775 Display Terminal mdls 11 and 12 -- 3641 Reporting Terminal mdls 1, 2 -- 3642 Encoder Printer mdls 1, 2 -- 3643 Keyboard Display mdls 2, 3, 4 -- 3644 Automatic Data Unit -- 3645 Printer -- 3646 Scanner Control Unit -- 3647 Time and Attendance Terminal.

Loop Attached Devices at 38,400 bps -- Devices that can be attached to a direct attached loop at 38,400 bps are the -- 3287 mdls 11 and 12, 8775 Display Station mdls 11 and 12.

Direct Attached Devices -- Devices that can be attached directly to the 8101 Storage and Input/Output Unit are the -- 3277 Display mdls 1, 2 -- 3284 Printer mdls 1, 2 -- 3286 Printer mdls 1, 2 -- 3287 Printer mdls 1, 2 -- 3288 Line Printer -- 8809 Magnetic Tape Unit mdl 1A.

NOTE 1: Dedication of a 9600 bps single lobe loop to the attachment of the 3289 mdl 3 printer should be considered in cases where the printer will be heavily utilized.

Loop Accessories and Wire: See M10000 pages for pricing and ordering instructions.

Customer Set-up (CSU): The 8101 Storage and Input/Output Unit is designated as customer set-up thereby offering the customer early availability and relocation flexibility. Aids and configurators are provided to enable the 8101 to be properly ordered and configured. Set-up procedures for the customer will be shipped with each machine. An 8101 installation verification program will be shipped with each machine on a diskette. A clear indication that the machine is operational will be given.

If the user relocates and/or interchanges attaching units from one system to another, the user must consider priority and address compatibility of the processor and its attachments.

Prerequisites: 8130 or 8140 Processor for mdls A10, A11 or A13. The 8101 model A10 requires one Display and Printer Attachment Type I (#9941) or Communication Attachment Type I (#9943).

Bibliography: Available at a later date.

Color: Pebble gray is the only color available.

Specify: [1] Voltage (120 VAC, 1-phase, 3-wire, 60Hz): Specify #9891 for non-lock plug or #9890 for locking plug. If 4.3 meter (14 ft) cable is not desired, specify #9986 for 1.8 meter (6 ft) cable.

[2] Cabling: For cabling information see Accessories pages (M10000), appropriate 8100 System installation manuals and Processor Site Preparation Guides.

[3] Processor Attachment: Specify #9931 for 8130 Processor or #9932 for 8140 Processor.

[4] System Attachment: Each 8101 requires a specify code to identify one of the four sets of I/O addresses. Specify one of the following codes for each 8101 attaching to the same processor: #9921, #9922, #9923, or #9924. These specify codes may be selected in any sequence. Duplicate codes are not permitted within a system. Relocation and/or interchange of 8101 units from one system to another system requires checking of the specify codes to avoid duplication.

[5] Device or Communication Attachment: One must be specified for the 8101 mdl A10. The mdl A10 provides as part of the basic machine, the capabilities to attach Display/Printer or Communication facilities. On initial orders for the mdl A10, one of these capabilities must be specified. Further expansion of the mdl A10 is provided by special features. These same capabilities are provided by special features for the mdls A11 and A13. See Table 1 for additional configuration information.

#9941 -- Display and Printer Attachment Type 1: Provides, in conjunction with feature #1505 and #1506, the capability for the attachment of 3277 Display, 3287 Printer and 3284, 3286 or 3288 Printers in any combination up to a maximum of twenty-four.

#9943 -- Communication Attachment Type 1: Provides the capability for the attachment of loops and communication facilities in any combination up to a maximum of four. Additional special features for line control communication interface and modems are required to complete each communication facility selected.

[6] Terminal Requirements: For attachment of 3640 family of terminals see terminal requirements on the 8130 and/or 8140 Machine pages.

PRICES:	Mdl	MRC	MLC 2 yr	Purchase	MMMC/ AMMCR
	8101				
	A10	\$201	\$171	\$ 6,500	\$17.00
	A11	477	406	14,970	55.50
	A13	524	446	16,410	63.50

Rental Plan: Plan D Machine Group: A
Useful Life Category: 2 Purchase Option: 55% Per Call: 1
Warranty: B Initial Period of Maintenance Service: 3 mos.
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Model upgrade requires replacement of the disk storage unit. Adequate provisions must be made for retaining data contained on the disk storage unit and elimination of user-proprietary information.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

Field conversion charge for Model A10 to A11 is \$ 9,570*
Field conversion charge for Model A10 to A13 is \$11,010*
Field conversion charge for Model A11 to A13 is \$ 2,500**

* For mdl A10 w/o #1507 and no change in the Type 1 (see Table 1) feature requirement. Submit an RPQ for all other conversions.

8101 Storage and Input/Output Unit (cont'd)

** Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model change involves the removal of parts which become the property of IBM."

SPECIAL FEATURES

Performance: The maximum number of Features for Attaching Communications (FAC) capable of concurrent operation is a function of the speed of the line, the communication facility, the operating system installed and the application work load. The maximum number of communication features which can be physically installed can exceed the operational capability. Increased processor utilization will result from sustained operation of BSC at the maximum aggregate data rate and may cause degradation of activity operating at lower priority levels. Analysis should be performed to determine the impact.

Diagnostics: The 8100 System hardware and feature operation, diagnostic support and maintenance support described in 8100 System publications are dependent on the presence of functional support modules provided by Distributed Processing Programming Executive (DPPX) or Distributed Processing Control Executive (DPCX). Operational and maintenance conditions for the 8100 System are predicated on the presence of these functional support modules. Customers ordering 8100 System hardware without DPPX or DPCX should provide the functional support as contained and described in the Functional Definition Manual 8100 which will be available at FCS.

DISPLAY AND PRINTER ATTACHMENT TYPE I (#1501). [Mdl's A11, A13 only] Provides in conjunction with feature #1505 and #1506 the capability for the attachment of 3277 Display, 3287 Printer and 3284, 3286 or 3288 Printers in any combination up to a maximum of twenty-four. **Limitations:** Not available with 8101 mdl A10. Not available with Communication Attachment Type I (#1503), Communication Attachment Type II (#1504) or Display and Printer Attachment Type II (#1502). See Table 1 for additional information. **Maximum:** One. See Table 2 for 8100 System maximums. **Field installation:** Yes.

DISPLAY AND PRINTER ATTACHMENT TYPE II (#1502). Provides in conjunction with feature #1505 and #1506 the capability for the attachment of 3277 Display, 3287 Printer and 3284, 3286 or 3288 Printers in any combination up to a maximum of twenty-four. **Limitation:** Not available with Display and Printer Attachment Type I (#1501 or #9941) or Communication Attachment Type II (#1504). See Table 1 for additional information. **Maximum:** One. See Table 2 for 8100 System maximums. **Field installation:** Yes. For field installation by purchase customer, see Note 2 under Table 1. **Prerequisite:** Communication Attachment Type I (#1503 or #9943).

COMMUNICATION ATTACHMENT TYPE I (#1503). [Mdl's A11, A13 only] Provides the capability for the attachment of loops and communication ports in any combination up to a maximum of four. Additional special features for line control, communication interface and modems are required to complete each communication facility selected. **Limitations:** Not available with 8101 mdl A10. Not available with Display And Printer Attachment Type I (#1501). See Table 1 for additional information. Only available with port positions one thru four. **Maximum:** One. See Table 2 for 8100 System maximums. **Field installation:** Yes. For field installation by purchase customer, see Note 2 under Table 1.

COMMUNICATION ATTACHMENT TYPE II (#1504). Provides the capability for the attachment of loops and communication ports in any combination up to a maximum of four. Additional special features for line control, communication interface and modems are required to complete each communication facility selected. **Limitation:** Not available with Display and Printer Attachment Type II (#1502) or Display and Printer Attachment Type I (#1501 or #9941). See Table 1 for additional information. Only available with port position five thru eight. **Maximum:** One. See Table 2 for 8100 System maximums. **Field installation:** Yes. **Prerequisite:** Communication Attachment Type I (#1503 or #9943).

DISPLAY AND PRINTER ADAPTER (#1505). Provides for the attachment of the first four 3277 Display, 3287 Printer and 3284, 3286, 3288 Printers. **Maximum:** One. See Table 2 for 8100 System maximums. **Field installation:** Yes. **Prerequisite:** Display And Printer Attachment Type I or II (#1501, #1502 or #9941).

DISPLAY AND PRINTER, ADDITIONAL (#1506). Provides for the attachment of additional 3277 Display, 3287 Printer and 3284, 3286 or 3288 Printers in any combination up to a maximum of four. **Maximum:** Five. See Table 2 for 8100 System maximums. **Field installation:** Yes. **Prerequisite:** Display And Printer Adapter (#1505).

TABLE 1

When configuring the 8101 for Display/Printer and Communication features, the Type I feature requirement should be determined first. The Type II should then be configured if so required. The table below shows the combinations of these features that may be configured.

8101 Mdl A10	
Type I	Type II
#9941	
OR	
#9943 with	#1502 or #1504
8101 Mdl A11 or A13	
Type I	Type II
#1501	
OR	
#1503 with	#1502 or #1504

NOTE: Purchase customers must submit an RPQ for field installation of #9943 with #1502 concurrent with removal of #9941 or field installation of #1503 with #1502 concurrent with removal of #1501.

DISKETTE DRIVE AND MAGNETIC TAPE ATTACHMENT (#1507). [Mdl A10 only] Provides the capability for the attachment of one Diskette 2D Drive (#4520) and one Magnetic Tape Attachment (#4521). **Limitations:** Only available with 8101 mdl A10. See special features #4520 and #4521 for Diskette Drive and Tape Attachment for the mdl A11 and A13. **Maximum:** One. See Table 2 for 8100 System maximums. **Field installation:** Yes.

CCITT V.35 INTERFACE (#1550). Provides interface to external modems/data communication equipment at 56,000 bps or direct connection at speeds of up to 9600 bps. **Maximum:** For speeds up to 9600 bps one per selected communications feature (#1601 or #1602). For operation at 56,000 bps one per 8101 unit, one per 8100 System. Operation at 56,000 bps is mutually exclusive with FAC codes 08, 09, and 21 and is not available when the 8101 is attached to the 8130 Processor. **Field installation:** Yes. **Prerequisites:** SDLC Communications with Clock (#1601) or SDLC Communications without Clock (#1602) and Multi-speed Clock (#5200). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

SDLC COMMUNICATIONS WITH BUSINESS MACHINE CLOCK (#1601). Provides control for EIA RS-232-C interface, integrated modems, direct connection and CCITT V.35 interface. **Limitation:** In an 8100 System only ten of these features (#1601 or #1602) may be active at one time. **Maximum:** Eight. See Table 2 for 8100 System maximums. The maximum is reduced by one for each communications feature (#1602, 1603 or 1604) selected. **Field installation:** Yes. **Prerequisite:** Communication Attachment Type I or II (#1503, #1504 or #9943). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

SDLC COMMUNICATIONS WITHOUT BUSINESS MACHINE CLOCK (#1602). Provides control for EIA RS-232-C or Digital Data Service Adapter (DDSA) interface, CCITT V.35 interface and Loop Adapter. **Limitation:** In an 8100 System only ten of these features (#1601 or #1602) may be active at one time. **Maximum:** Eight. See Table 2 for 8100 System maximums. The maximum is reduced by one for each communications feature (#1601, 1603 or 1604) selected. **Field installation:** Yes. **Prerequisite:** Communication Attachment Type I or II (#1503, #1504 or #9943). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

BSC/SS COMMUNICATIONS WITH BUSINESS MACHINE CLOCK (#1603). Provides control for EIA RS-232-C interface, integrated modems or direct connection. **Limitations:** Start/Stop communications are not available with integrated modems. In an 8100 System with a 8130 Processor attached, the maximum aggregate BSC data rate is 9600 bps and 330 bps for Start/Stop. With an 8140 Processor attached, the maximum aggregate data rate is 19,200 and 660 for Start/Stop. **Maximum:** Eight. See Table 2 for 8100 System maximums. The maximum is reduced by one for each communications feature (#1601, 1602 or 1604) selected. **Field installation:** Yes. **Prerequisite:** Communication Attachment Type I or II (#1503, #1504 or #9943). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

BSC COMMUNICATIONS WITHOUT BUSINESS MACHINE CLOCK (#1604). Provides control for EIA RS-232-C or Digital Data Service Adapter (DDSA) interface and direct connection. **Limitation:** In an 8100 System with a 8130 Processor attached, the maximum aggregate BSC data rate is 9600 bps. With a 8140 Processor attached, the maximum aggregate BSC data rate is 19,200 bps. **Maximum:** Eight. See Table 2 for 8100 System maximums. The maximum is reduced by one for each communications feature (#1601, 1602 or 1603) selected. **Field installation:** Yes. **Prerequisite:** Communication Attachment Type I or II (#1503, #1504 or #9943). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.



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EIA RS-232-C INTERFACE (#3701). Provides interface to external modems/data communication equipment or direct connection at speeds of up to 9600 bps. **Maximum:** One per selected communications feature (#1601, 1602, 1603 or 1604). **Field installation:** Yes. **Prerequisites:** SDLC Communications with Business Machine Clock (#1601), SDLC Communications without Clock (#1602), BSC/SS Communications with Business Machine Clock (#1603), BSC Communications without Clock (#1604), SDLC Communications without Business Machine Clock (#1602) and Multi-speed Clock (#5200), BSC Communications without Business Machines Clock (#1604) and Multi-speed Clock (#5200). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

DISKETTE 2D DRIVE (#4520). Provides 1MB (985,088) of removable diskette storage for the 8101 mdl A10, A11 or A13 operating at a data rate of up to 62KB per second. **Maximum:** One. See Table 2 for 8100 System maximums. **Field installation:** Yes. **Prerequisite:** Diskette Drive and Magnetic Tape Attachment (#1507) for the mdl A10.

MAGNETIC TAPE ATTACHMENT (#4521). Provides for the attachment to the 8101 mdl A10, A11 or A13 of up to four 8809 Magnetic Tape Units, consisting of one 8809 mdl 1A plus two mdl 2s and one mdl 3. **Limitation:** Not available if the 8130 or 8140 Processor has the 8809 Magnetic Tape Unit mdl 1B attached. **Maximum:** One. See Table 2 for 8100 System maximums. **Field installation:** Yes. **Prerequisite:** Diskette Drive and Magnetic Tape Attachment (#1507) for the mdl A10.

LOOP ADAPTER (#4830). Provides for the direct attachment of a single lobe loop at 9600 or 38,400 bps. **Maximum:** One per selected communications feature (#1602). Only one of these features may operate at 38,400 bps in an 8100 System. See Table 2 for 8100 System maximums. The maximum is reduced by one for each selected communications facility attached to the 8101. **Field installation:** Yes. **Prerequisite:** SDLC Communications without Clock (#1602). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

LOOP ADAPTER SECOND LOBE (#4835). Provides for the attachment of a separate physical loop cable to extend the coverage and availability of the directly attached loop. **Maximum:** One per Communication Attachment Type I or II (#1503, #1504 or #9943). See Table 2 for 8100 System maximums. **Field installation:** Yes. **Prerequisite:** Loop Adapter (#4830). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

MULTI-SPEED CLOCK (#5200). Provides business machine clocking at 4800 bps and 9600 bps for direct connection. Can provide multiple speeds simultaneously. **Maximum:** One with Communication Attachment Type I (#1503 or #9943) for port positions one thru four and one with Communication Attachment Type II (#1504) for port positions five thru eight. See Table 2 for 8100 System maximums. **Field installation:** Yes. **Prerequisite:** Communication Attachment Type I or II (#1503, #1504 or #9943) and either SDLC Communications Feature without Business Machine Clock (#1602) or BSC Communications Feature without Business Machine Clock (#1604). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

MODEM, INTEGRATED, NON-SWITCHED (#5500). Provides interface to common carrier leased facilities at 600 or 1200 bps. **Limitation:** Not available for Start/Stop communication facilities. **Maximum:** One per selected communications feature (#1601 or #1603). **Field installation:** Yes. **Prerequisite:** SDLC Communications with Business Machine Clock (#1601), or BSC/SS Communications with Business Machine Clock (#1603). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

MODEM, INTEGRATED, SWITCHED (#5501). Provides interface to common carrier switched facilities with auto answer at 600 or 1200 bps. **Limitation:** Not available with BSC or Start/Stop communication facilities. **Maximum:** One per selected communications feature (#1601). **Field installation:** Yes. **Prerequisite:** SDLC Communications with Business Machine Clock (#1601). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

DIGITAL DATA SERVICE ADAPTER (DDSA) (#5660). Provides interface to AT&T Dataphone* Digital Service Network for transfer of digital data at speeds of 2400, 4800, 9600 bps in point-to-point or multipoint configurations or 56,000 bps in point-to-point configurations. **Maximum:** For speeds up to 9600 bps one per selected communication feature (#1602 or #1604). For operation at 56,000 bps one per 8101 unit, one per 8100 System. Operation at 56,000 bps is mutually exclusive with FAC codes 08, 09 or 29 and is not available when the 8101 is attached to the 8130 Processor. **Field installation:** Yes. **Prerequisites:** SDLC Communications with Clock (#1602) for operation to 56,000 bps or BSC Communications without Clock (#1604) for operation to 9600 bps. **Specify:** Code as provided in FAC description in "Communication

Capabilities" section.

SECURITY COVER LOCKS (#6555). This feature provides key operated security locks for the machine covers, restricting access to the machine interior and external cable connector area. See Security Lock Diskette (#6566) if diskette security is required. Additional or replacement keys are not available from IBM. **Maximum:** One. **Field installation:** Yes.

SECURITY LOCK, DISKETTE (#6566). This feature provides a key operated security lock to restrict access to the diskette magnetic media. It is accessible only by opening the front cover. For maximum security, the Security Cover Lock (#6555) must be used in addition to the diskette security lock. Additional or replacement keys are not available from IBM. **Maximum:** One. **Field installation:** Yes.

8100 System Maximums

The following table lists the system maximums common to the 8130, 8140 and 8101. Depending on the processor and special features selected, these maximums may not be possible. See the appropriate Machines pages for additional feature information.

TABLE 2

Machine/ Feature/Function	System Processor			
	8130 All	8140 A31-A34	8140 A41-A44	8140 A51-A54
8101 See Note 3	2	4	4	4
Disp./Prt. Attach Fea #1501, #1502, #9941	1	1	1	1
Display/Printer Adapter #1505	1	1	1	1
Add'l #1506	5	5	5	5
Communications Attach #1503, 9943	1	2	2	2
Communications Attach #1504	1	2	2	2
Diskette Drive *	1	1	1	1
Tape Attachment	1	1	1	1
Communication Ports	14	19	18	16
SDLC, BSC/SS Loop at 38.4K bps	1	1	1	1
2nd Lobe #4835	5	6	6	4
Multi-speed Clock #5200	3	5	5	4

NOTE 3: Only one 8101 may have Communication and Display/Printer features with the 8130 Processor. Only two 8101 units may have Communication and Display/Printer feature with the 8140 Processor.

* One additional Diskette Drive (#4520) is available on a 8101.

Special Feature Prices:	MRC	MLC 2 yr	Purchase	MMMC/ AMMCR
Display & Printer Attach				
Type I	#1501 \$ 27	\$ 23	\$ 900	\$ 4.00
Type II	1502 13	11	400	.50
Commun Attach Type I	1503 27	23	900	4.00
Commun Attach Type II	1504 13	11	400	.50
Display & Printer Adapter	1505 75	64	2,300	15.00
Display & Printer, Add'l	1506 13	11	420	3.00
Diskette Dr/Tape Attach	1507 27	23	900	4.00
CCITT V.35 Interface	1550 15	13	510	2.00
SDLC Communications				
w Bus Machine Clock	1601 41	35	900	8.00
w/o Bus Machine Clock	1602 35	30	840	7.50
BSC/SS Communications				
w Bus Machine Clock	1603 19	16	670	3.00
BSC Communications				
w/o Bus Machine Clock	1604 12	10	450	2.50
EIA RS-232-C Interface	3701 12	10	400	4.00
Diskette 2D Drive	4520 94	80	2,880	27.50
Magnetic Tape Attach	4521 59	50	1,800	9.00
Loop Adapter	4830 20	17	605	4.00
Loop Adapter, 2nd Lobe	4835 20	17	605	4.00
Multi-speed Clock	5200 13	11	420	1.50
Modem, Integrated,				
Non-switched	5500 19	16	668	5.00
Switched	5501 25	21	840	6.50
DDSA	5660 24	20	840	2.00
Security Cover Locks	6555 35 SUC	-	35	N/C
Security Lock, Diskette	6566 30 SUC	-	30	N/C

COMMUNICATION CAPABILITIES

There are a variety of communication facilities (see M 2700 pages) supported by the 8101 Features for Attaching Communications (FAC) differing in speed, protocol and attachment interfaces. These FAC codes have been categorized as Loop, SDLC, BSC and Start/Stop. The user should select the desired communication FAC code and refer to the full special feature description and the FAC code description (identified by the abbreviation FAC No.) for

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additional details. Reference to switched communications in the FAC codes, refers to the communication link between the 8100 System and the S/370 or 4300 Processors.

The 8101 special features allow a maximum of eight communication capabilities to be configured and designated as communication ports. Each communication port position (1 thru 8) must consist of a communications feature for SDLC, BSC or Start/Stop.

The SDLC communications feature is available with and without business machine clock (#1601, #1602). The BSC/SS communications feature (#1603) is available with business machine clock and the BSC Communications feature (#1604) is available without business machine clock. If an 8101 communications port is to provide the attached facility with business machine clock at speeds greater than 2400 bps the Multi-speed Clock feature (#5200) is required. The Multi-speed Clock feature (#5200) can provide business machine clocking at speeds greater than 2400 bps.

In addition to selecting a communications feature (#1601, 1602, 1603, 1604) for each port configured in an 8101, a communication interface or integrated modem must be selected to support the communication facility attaching to that port. Direct connect at 4800 and 9600 bps require the Multi-speed Clock feature (#5200). Each port of the 8101 also requires the selection of a specify code to indicate the System 8100 FAC code selected for that port. Certain System 8100 FAC codes will require a second specify code to select options available within that facility: 2/4 wire, line speed or multipoint control/tributary.

NOTE: The selected option specified within a given FAC and specific port position can be changed in the field by Field Engineering. All such changes are chargeable at the applicable FE hourly rate.

Specify Codes and FAC Code Descriptions:

A specify code number is required to identify the selected FAC code and its physical port position. Communication Attachment Type I (#9943, #1503) is specified as port positions one thru four and Communication Attachment Type II (#1504) is specified as port positions five thru eight. The specify code is constructed by concatenating the selected FAC and its port position to the numeral 9. e.g.:

#9ABC where AB = FAC No. and C = Port Position.

FAC codes range in number from 08 to 61 resulting in FAC specify codes ranging in number from #9081 to #9618. Additional codes must be specified for selected options. Those codes are outlined in the FAC code descriptions. No two FAC codes can occupy the same port position. Configuration Manual GA27-2876 will aid in assigning the port positions.

----- LOOP -----

FAC No.	FAC Code Description
FAC 8	Loop, high speed single lobe at 38,400 bps
FAC 9	Loop, high speed two lobe at 38,400 bps
FAC 10	Loop, single lobe at 9600 bps
FAC 11	Loop, two lobes at 9600 bps

FAC 8 - Loop, High Speed, Single Lobe -- Required for operating a loop at 38,400 bps. **Limitation:** Not available with FAC 09 Loop, High Speed, Two Lobe #9091 thru #9098 and FAC 21 and 29. **Prerequisites:** #1602 and #4830. **Maximum:** One per 8101. One per 8100 System. **Specify:** From the table below, specify the required code to complete the configuration for the port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9081	#9082	#9083	#9084	#9085	#9086	#9087	#9088

FAC 9 - Loop, High Speed, Two Lobe -- Required for operating a two lobe loop at 38,400 bps. **Limitation:** Not available with FAC 08 Loop, High Speed, Single Lobe (#9081 thru #9088) and FAC 21 and 29. **Prerequisites:** #1602, #4830 and #4835. **Maximum:** One per 8101. One per 8100 System. **Specify:** From the table below, specify the required code to complete the configuration for the port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9091	#9092	#9093	#9094	#9095	#9096	#9097	#9098

FAC 10 - Loop, Single Lobe -- Required for operating a loop at 9600 bps. **Prerequisites:** #1602 and #4830. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
-----------------------	--------	--------	--------	--------	--------	--------	--------	--------

Port	#9101	#9102	#9103	#9104	#9105	#9106	#9107	#9108
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FAC 11 - Loop, Two Lobe -- Required for operating two lobe loops at 9600 bps. **Prerequisites:** #1602, #4830 and #4835. **Maximum:** One for ports one thru four and one for ports five thru eight. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9111	#9112	#9113	#9114	#9115	#9116	#9117	#9118

----- SDLC -----

FAC No.	FAC Code Description
EIA RS-232-C	
FAC 12	600 or 1200 bps (external modem)
FAC 13	Up to 9600 bps (external modem)
FAC 15	600, 1200 or 2400 bps, direct connect with clock (no modem)
FAC 16	4800 or 9600 bps direct connect with clock (no modem)
FAC 17	Direct connect without clock
Integrated Modem	
FAC 18	600 or 1200 bps non-switched
FAC 19	600 or 1200 bps switched with auto answer
AT&T Dataphone Digital Service	
FAC 20	2400, 4800 or 9600 bps non-switched
FAC 21	56,00 bps non-switched
CCITT V.35	
FAC 24	Direct connect with clock (no modem) 600, 1200 or 2400 bps
FAC 25	Direct connect with clock (no modem) 4800 or 9600 bps
FAC 27	Direct connect without clock (no modem) 9600 bps
FAC 29	56,000 bps non-switched

FAC 12 - EIA RS-232-C Interface -- 600 or 1200 bps with business machine clock ... operating with external modem without clocking ... and point-to-point switched 2 wire ... or point-to-point non-switched 2 or 4 wire ... or multipoint 4 wire. **Prerequisites:** #1601 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9121	#9122	#9123	#9124	#9125	#9126	#9127	#9128
600 bps	9741	9742	9743	9744	9745	9746	9747	9748
1200 bps	9751	9752	9753	9754	9755	9756	9757	9758

FAC 13 - EIA RS-232-C Interface -- Up to 9600 bps without business machine clock ... with external data communication equipment and clock ... point-to-point switched with auto answer to 4800 bps ... or point-to-point non-switched 2 or 4 wire ... or multipoint 4 wire. **Prerequisites:** #1602 and #3701. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9131	#9132	#9133	#9134	#9135	#9136	#9137	#9138

FAC 15 - EIA RS-232-C Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal or 8100 System must not provide business machine clock) and direct connection up to 40 feet. **Prerequisites:** #1601 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9151	#9152	#9153	#9154	#9155	#9156	#9157	#9158
600 bps	9741	9742	9743	9744	9745	9746	9747	9748
1200 bps	9751	9752	9753	9754	9755	9756	9757	9758
2400 bps	9761	9762	9763	9764	9765	9766	9767	9768

FAC 16 - EIA RS-232-C Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem (attached downstream terminal must not provide business machine clock) ... and direct connection up to 40 feet. **Limitation:** One Multi-speed Clock (#5200) is required for port positions one thru four or five thru eight. **Prerequisites:** #1602, #3701 and #5200. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9161	#9162	#9163	#9164	#9165	#9166	#9167	#9168



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4800 bps	9771	9772	9773	9774	9775	9776	9777	9778
9600 bps	9781	9782	9783	9784	9785	9786	9787	9788

FAC 17 - EIA RS-232-C Interface -- Up to 9600 bps without business machine clock ... operating with other 8100 System (with business machine clock) ... and direct connection up to 40 feet. **Prerequisites:** #1602 and #3701. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9171	#9172	#9173	#9174	#9175	#9176	#9177	#9178

FAC 18 - Integrated Modem -- 600 or 1200 bps ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Prerequisites:** #1601 and #5500. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9181	#9182	#9183	#9184	#9185	#9186	#9187	#9188
2-wire								
600 bps	9851	9852	9853	9854	9855	9856	9857	9858
1200 bps	9861	9862	9863	9864	9865	9866	9867	9868
4-wire								
600 bps	9741	9742	9743	9744	9745	9746	9747	9748
1200 bps	9751	9752	9753	9754	9755	9756	9757	9758

FAC 19 - Integrated Modem -- 600 or 1200 bps ... point-to-point switched with auto answer 2 wire. **Prerequisites:** #1601 and #5501. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9191	#9192	#9193	#9194	#9195	#9196	#9197	#9198
600 bps	9741	9742	9743	9744	9745	9746	9747	9748
1200 bps	9751	9752	9753	9754	9755	9756	9757	9758

FAC 20 - Digital Network Interface (to AT&T Dataphone Digital Service) -- 2400, 4800, 9600 bps without business machine clock ... and 4 wire point-to-point non-switched ... or multipoint non-switched. **Prerequisites:** #1602 and #5660. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9201	#9202	#9203	#9204	#9205	#9206	#9207	#9208
Point-to-point or Multipoint Control								
2400 bps	9001	9002	9003	9004	9005	9006	9007	9008
4800 bps	9021	9022	9023	9024	9025	9026	9027	9028
9600 bps	9041	9042	9043	9044	9045	9046	9047	9048
Multipoint Tributary								
2400 bps	9011	9012	9013	9014	9015	9016	9017	9018
4800 bps	9031	9032	9033	9034	9035	9036	9037	9038
9600 bps	9051	9052	9053	9054	9055	9056	9057	9058

FAC 21 - Digital Network Interface (to AT&T Dataphone Digital Service) -- 56,000 bps without business machine clock ... and point-to-point non-switched operation. **Prerequisite:** #1602 and #5660. **Maximum:** One per 8101, system maximum is one per 8100 System (not available with FAC codes 8, 9 or 29). **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9211	#9212	#9213	#9214	#9215	#9216	#9217	#9218

FAC 24 - CCITT V.35 Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem ... and direct connection up to 1000 feet. **Prerequisites:** #1601 and #1550. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9241	#9242	#9243	#9244	#9245	#9246	#9247	#9248
600 bps	9741	9742	9743	9744	9745	9746	9747	9748
1200 bps	9751	9752	9753	9754	9755	9756	9757	9758
2400 bps	9761	9762	9763	9764	9765	9766	9767	9768

FAC 25 - CCITT V.35 Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem ... and direct connection up to 1000 feet. **Limitation:** One Multi-speed Clock is required for port position one thru four or five thru eight. **Prerequisites:** #1602, #1550 and #5200. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9251	#9252	#9253	#9254	#9255	#9256	#9257	#9258
4800 bps	9771	9772	9773	9774	9775	9776	9777	9778
9600 bps	9781	9782	9783	9784	9785	9786	9787	9788

FAC 27 - CCITT V.35 Interface -- Up to 9600 bps without business machine clock ... operating with other 8100 System (with business machine clock) ... and direct connection up to 1000 feet. **Prerequisites:** #1602 and #1550. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9271	#9272	#9273	#9274	#9275	#9276	#9277	#9278

FAC 29 - CCITT V.35 Interface -- 56,000 bps without business machine clock and external data communication equipment with clock, and point-to-point non-switched. **Limitation:** Not available when 8101 is attached to the 8130 Processor. **Prerequisite:** #1602 and #1550. **Maximum:** One per 8101. System maximum is one per 8100 System. (not available with FAC codes 8, 9 and 21). **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9291	#9292	#9293	#9294	#9295	#9296	#9297	#9298

- - - - BSC - - -

FAC No. FAC Code Description

EIA RS-232-C

- FAC 40 600 or 1200 bps (external modem)
- FAC 41 Up to 9600 bps (external modem)
- FAC 43 600, 1200 or 2400 bps, direct connect with clock (no modem)
- FAC 44 4800 or 9600 bps, direct connect with clock (no modem)

Integrated Modem

- FAC 45 600 or 1200 bps non-switched

AT&T Dataphone Digital Service

- FAC 47 2400, 4800 or 9600 bps non-switched

FAC 40 - EIA RS-232-C Interface -- 600 or 1200 bps with business machine clock ... operating with external modem with no clock ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9401	#9402	#9403	#9404	#9405	#9406	#9407	#9408
600 bps	9741	9742	9743	9744	9745	9746	9747	9748
1200 bps	9751	9752	9753	9754	9755	9756	9757	9758

FAC 41 - EIA RS-232-C Interface -- Up to 9600 bps without business machine clock ... operating with external data communication equipment ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Prerequisites:** #1604 and #3701. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9411	#9412	#9413	#9414	#9415	#9416	#9417	#9418

FAC 43 - EIA RS-232-C Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal must not provide business machine clock) and direct connection up to 40 feet. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9431	#9432	#9433	#9434	#9435	#9436	#9437	#9438
600 bps	9741	9742	9743	9744	9745	9746	9747	9748
1200 bps	9751	9752	9753	9754	9755	9756	9757	9758
2400 bps	9761	9762	9763	9764	9765	9766	9767	9768

FAC 44 - EIA RS-232-C Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem (attached downstream terminal must not provide business machine clock) ... and direct connection up to 40 feet. **Limitation:** One Multi-speed Clock (#5200) is required for port position one thru four or five thru eight. **Prerequisites:** #1604, #3701 and #5200. **Specify:**

8101 Storage and Input/Output Unit (cont'd)

From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9441	#9442	#9443	#9444	#9445	#9446	#9447	#9448
4800 bps	9771	9772	9773	9774	9775	9776	9777	9778
9600 bps	9781	9782	9783	9784	9785	9786	9787	9788

FAC 45 - Integrated Modem -- 600 or 1200 bps ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Prerequisites:** #1603 and #5500. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9451	#9452	#9453	#9454	#9455	#9456	#9457	#9458
2-wire								
600 bps	9851	9852	9853	9854	9855	9856	9857	9858
1200 bps	9861	9862	9863	9864	9865	9866	9867	9868
4-wire								
600 bps	9741	9742	9743	9744	9745	9746	9747	9748
1200 bps	9751	9752	9753	9754	9755	9756	9757	9758

FAC 47 - Digital Network Interface (to AT&T Dataphone Digital Service) -- 2400, 4800 or 9600 bps without business machine clock ... 4 wire point-to-point non-switched ... or multipoint non-switched. **Prerequisites:** #1604 and #5660. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9471	#9472	#9473	#9474	#9475	#9476	#9477	#9478
Point-to-point or Multipoint Control								
2400 bps	9001	9002	9003	9004	9005	9006	9007	9008
4800 bps	9021	9022	9023	9024	9025	9026	9027	9028
4800 bps	9041	9042	9043	9044	9045	9046	9047	9048
Multipoint Tributary								
2400 bps	9011	9012	9013	9014	9015	9016	9017	9018
4800 bps	9031	9032	9033	9034	9035	9036	9037	9038
9600 bps	9051	9052	9053	9054	9055	9056	9057	9058

- - - START/STOP - - -

FAC No. FAC Code Description

EIA RS-232-C	FAC No.	FAC Code	Description
	FAC 60	110, 134.5, 150, 300 or 600 bps	(external modem)
	FAC 61	110, 134.5, 150, 300 or 600 bps, direct connect with clock	(no modem)

FAC 60 - EIA RS-232-C Interface -- 134.5, 300, 600 bps with business machine clock ... operating with external modem ... and point-to-point non-switched facilities. See M 2700 pages for specific information on communication facilities and other attachment information.

Also 110 or 150 bps with business machine clock ... operating with external modem ... and point-to-point non-switched facilities will be provided under provisions of the IBM Multiple Supplier System Policy. **Limitation:** The 600 bps line speed is not available when the 8101 is attached to an 8130 Processor. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9601	#9602	#9603	#9604	#9605	#9606	#9607	#9608
110 bps	9701	9702	9703	9704	9705	9706	9707	9708
134.5bps	9711	9712	9713	9714	9715	9716	9717	9718
150 bps	9721	9722	9723	9724	9725	9726	9727	9728
300 bps	9731	9732	9733	9734	9735	9736	9737	9738
600 bps	9741	9742	9743	9744	9745	9746	9747	9748

FAC 61 - EIA RS-232-C Interface -- 110, 134.5, 150, 300, 600 bps with business machine clock ... operating with no modem (the attached terminal must provide its own business machine clock) ... and direct connection to 40 feet. **Limitation:** The 600 bps line speed is not available when the 8101 is attached to an 8130 Processor. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port	#9611	#9612	#9613	#9614	#9615	#9616	#9617	#9618
110 bps	9701	9702	9703	9704	9705	9706	9707	9708
134.5 bps	9711	9712	9713	9714	9715	9716	9717	9718
150 bps	9721	9722	9723	9724	9725	9726	9727	9728

300 bps	9731	9732	9733	9734	9735	9736	9737	9738
600 bps	9741	9742	9743	9744	9745	9746	9747	9748

HOST AND TERMINAL MODEM FACILITIES

For communication facilities and modem attachment data, see the M 2700 and appropriate Machines pages for additional information.

- 1200 bps integrated modem, switched and non-switched
- Dataphone Digital Service Adapter
- 3863 Modem, switched and non-switched
- 3864 Modem, switched and non-switched
- 3865 Modem, non-switched
- 3872 Modem, switched and non-switched
- 3874 Modem, switched and non-switched
- 3875 Modem, non-switched

DIRECT CONNECTION ATTACHMENT

In addition to terminal attachment to the 8100 System through common carrier facilities (see M 2700 pages) or local loops, attachment can be made by direct connect. The direct connect is made by using the SDLC (FAC 15 or 16), BSC (FAC 43 or 44) and Start/Stop (FAC 61). Shown below are the direct connect attachable devices and required device feature numbers. The IBM 8100 Information System Installation Manual - Physical Planning, GA27-2877, will assist in the selection of direct connect cables.

FAC Code	Attach Device	Speeds (bps)	Device Feature No.
15	3276	600, 1200, 2400	#3701 w/#9491 and #6302
16	3276	4800, 9600	#3701, w/#9491 and #6302
15	3767	600, 1200, 2400	#3718, w/#9707, #9533
61	2741	134.5	#9115 or #9120
15, 24	8130/8140/8101	600, 1200, 2400	#3701 (FAC 17) or #1550 (FAC 27) and #1602
	8775-11, 12	600, 1200, 2400	#3701 (FAC 15) or #1550 (FAC 24)
16, 25	8130/8140	4800, 9600	#3701 (FAC 17) or #1550 (FAC 27) and #1602
	8775-11, 12	4800, 9600	#3701 (FAC 16) or #1550 (FAC 25)
43	2780/3780 Line Protocol	600, 1200, 2400	Refer to specific device See Note 4
44	2780/3780 Line Protocol	4800, 9600	Refer to specific device See Note 4

Note 4: For attachment of devices that conform to 2780/3780 protocol.

**IBM 8130 PROCESSOR**

Purpose: Provides control, storage, processing capability, disk and diskette storage, and device attachment capabilities for the IBM 8100 Information System.

Models: The following models of the 8130 are available depending on processor storage size and non-removable disk storage size. Some models have fixed head capability as well as movable heads for the non-removable, high speed, direct access disk storage. All 8130 models include removable diskette storage with up to 1 million bytes of storage.

Model	Base Processor Storage (bytes)	Non Removable Disk Capacity (million bytes)	Fixed Head Capacity (bytes)
A21	256K (262,144)	29MB (29,327,360)	None
A22	256K (262,144)	23MB (23,461,888)	131,072
A23	256K (262,144)	64MB (64,520,192)	None
A24	256K (262,144)	58MB (58,654,720)	131,072

Maximum: One per 8100 Information System.

Highlights: The 8130 Processor is a multi-level, interrupt driven processor which provides control, processing capability, processor storage, disk and diskette storage and communication features for the 8100 Information System. The flexibility offered by the 8130 allows the user to configure a system for initial requirements, while retaining the ability to modify the system to meet future needs.

System control and processing is provided by machine program instructions and up to eight I/O hardware interrupt levels provide for interrupt processing. The 8130 provides 256K (262,144) bytes of processor storage that can be expanded to a maximum of 512K (524,288) bytes and provision for dynamic addressing and storage protection for up to 4 million bytes of logical storage.

The 8130 with a special feature for system expansion provides for the attachment of up to two 8101 Storage and Input/Output Units one of which may be configured with Communication and Display/Printer Feature Type I or Type II, or one 8101 Storage and Input/Output Unit and one 8809 Magnetic Tape Unit mdl 1B. An alternate configuration can consist of a 8130, two 8101 Storage and Input/Output Units, and one 8809 Magnetic Tape Unit mdl 1A. Up to three additional 8809 Magnetic Tape Units can be attached to the 8809 Magnetic Tape Unit mdl 1A or 1B.

The 8130 Processor is provided with fixed high speed direct access storage. Depending on the 8130 model selected, disk storage of up to 64 million bytes with movable heads or up to 58 million bytes of disk storage with movable and fixed heads is available. The disk storage operates at a data rate of 1.031 million bytes per second. The average access time is 27 milliseconds with an average rotational delay of 9.6 milliseconds. Removable diskette storage is available with up to 1MB (985,088) of storage operating at up to 62K bytes per second data rate. The diskette drive can read/write in basic data exchange format on either the IBM diskette 2D or the IBM diskette Type 1.

The 8100 System can attach to any S/370 or 4300 Processors via the 3704/3705 for SNA/SDLC or BSC line control. The 8100 System can attach to the ICA of the 115, 125, 135 or 138 processors for BSC line control. The IBM 8100 System can attach to the Communications Adapter of the 4331 Processor for BSC and/or SDLC line control. For specific attachment, see M 2700 pages.

The capability of the 8100 Information System is further extended by providing for the attachment of a variety of input/output devices. These devices may be attached to the 8130 via communication features which include data link, direct connect, and loops that are direct attached or data link attached loops. The 8130 provides for the attachment of two communication ports which can be expanded by optional features up to a maximum of six. With the 8101 Storage and Input/Output Unit attached, the communication ports physically attached can be further increased by eight, providing an 8100 System maximum of fourteen communication ports.

Communication Attached Devices: Devices that can be attached to the communications ports are the -- 3276 Control Unit Display Station mdls 1, 2, 3, 4, 11, 12, 13, 14 with 3278 Display Station mdls 1, 2, 3, 4, 3287 Printer mdls 1, 2 and 3289 Line Printer mdls 1, 2 -- 3767 Communication Terminals mdls 1, 2, 3 -- 3631 Plant Communications Controller mdls 1A, 1B -- 3632 Plant Communications Controller mdls 1A, 1B -- 8775 Display Terminal mdls 11 and 12 -- 2741 Communications Terminal -- TTY 33/35 or equivalent -- non-IBM terminals conforming to the 2780/3780 line protocol -- 3842 Loop Control Unit -- 8130 Processor -- 8140 Processor -- 8101 Storage and Input/Output Unit.

Loop Attached Devices at 2400 or 9600 bps: Devices that can be attached to a direct attached loop at 9600 bps or data link attached loop at 2400 bps are the -- 3287 Printer mdls 11, 12, --

3289 Printer mdl 3 with 3501 Card Reader and via the 3782 Card Attachment Unit the 3521 Card Punch and 2502 Card Reader mdl A1 (see Note 1) -- 3276 Control Unit Display Station mdls 11, 12, 13, 14 with 3278 Display Station mdls 1, 2, 3, 4, 3287 Printer mdls 1, 2, 3289 Line Printer mdls 1, 2 -- 8775 Display Terminal mdls 11 and 12 -- 3641 Reporting Terminal mdls 1, 2 -- 3642 Encoder Printer mdls 1, 2 -- 3643 Keyboard Display mdls 2, 3, 4 -- 3644 Automatic Data Unit -- 3645 Printer -- 3646 Scanner Control Unit -- 3647 Time and Attendance Terminal.

Loop Attached Devices at 38,400 bps: Devices that can be attached to a direct attached loop at 38,400 bps are the -- 3287 mdls 11, 12, 8775 Display Terminal mdls 11 and 12.

Direct Attached Devices: Devices that can be attached directly to the processor are the -- 8101 Storage and Input/Output Unit -- 8809 Magnetic Tape Unit mdl 1B.

NOTE 1: Dedication of a 9600 bps single lobe loop to the attachment of the 3289 mdl 3 printer should be considered in cases where the printer will be heavily utilized.

Loop Accessories and Wire: See M10000 pages for pricing and ordering instructions.

Customer Set-up: The 8130 Processor is designated a customer set-up unit thereby offering the customer early availability and relocation flexibility. Aids and configurators are provided to facilitate the configuration and ordering of the 8130. Set-up procedures for the customer will be shipped with each machine. An 8130 installation verification program will be shipped with each machine on a diskette. A clear indication that the machine is operational will be given.

If the user relocates and/or interchanges attaching units from one system to another, the user must consider priority and address compatibility of the processor and its attachments.

PREREQUISITES: None.

Bibliography: Available at a later date.

Color: Pebble gray is the only available color.

Specify: [1] (120 VAC, 1-phase, 3-wire, 60Hz): #9891 for non-locking plug, or #9890 for locking plug. If 4.3 meter (14 ft) power cable is not desired, specify #9986 for 1.8 meter (6 ft) cable.

[2] Cabling: For cabling information see Accessories pages (M10000), appropriate 8100 Information System Installation manuals and Processor Site Preparation Guides.

[3] Programming Configuration: Specify #9700 for Distributed Processing Programming Executive (DPPX), #9710 for Distributed Processing Control Executive (DPCX), #9720 for DPPX and DPCX, or #9730 for all other configurations.

[4] Terminal Requirements: Specify #9800 (off line 3640 terminal exercisor) if ordering any of the following terminals: 3641, 3642, 3643, 3644, 3645, 3646 or 3647 -

- 1) On the initial order.
- 2) When the first terminal is ordered to attach via an 8101, and none are attached to the processor.
- 3) Via when the first terminal is field installed on an 8100 System.

Maximum: One per 8100 System. **Field installation:** Yes.

PRICES:	Mdl	MRC	MLC 2 yr	Purchase	MMMC/ AMMCR
	A21	\$705	\$600	\$24,000	\$122
	A22	729	620	24,720	130
	A23	752	640	25,440	130
	A24	776	660	26,160	138

Rental Plan: Plan D Machine Group: A
Useful Life Category: 2 Purchase Option: 55% Per Call: 1
Warranty: B Initial Period of Maintenance Service: 3 mos.
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Model upgrade may require replacement of disk storage unit. Adequate provisions must be made for retaining data contained on disk storage unit and elimination of user proprietary information.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From	To	A22	A23	A24
A21	\$2,200	\$2,500	\$3,000	
A22		2,300	2,800	
A23			2,500	

Customer price quotations and customer order and acknowledgment letters for purchase of must state: "Installation of this model change involves removal of parts which become the property of IBM."



8130 Processor (cont'd)

SPECIAL FEATURES

Performance: The maximum number of Features for Attaching Communications (FAC) capable of concurrent operation is a function of the speed of the line, communication facility, the operating system installed and the application work load. The maximum number of communication facilities which can be physically installed can exceed the operational capability. Increased processor utilization will result from sustained operation of BSC at the maximum aggregate data rate and may cause degradation of activity operating at lower priority levels. Analysis should be performed to determine the impact.

Diagnostics: The 8100 System hardware and feature operation, diagnostic support and maintenance support described in 8100 System publications are dependent on the presence of functional support modules provided by DPPX, DPCX. Operational and maintenance conditions for the 8100 System are predicated on the presence of these functional support modules. Customers ordering 8100 System hardware without DPPX or DPCX should provide the functional support as contained and described in the Functional Definition Manual 8100 which will be available at FCS.

FEATURE EXPANSION TYPE 1 (#1520). Allows the 8130 to be expanded from two communication ports to six communication ports. #1520 is required for the attachment of two lobe loops or communication features requiring the Multi-speed Clock (#5200). **Maximum:** One per 8130. **Field Installation:** Yes.

SYSTEM EXPANSION (#1530). Provides programmable hardware interrupt levels and sublevel interrupt determination. Required for attachment of up to two 8101 Storage and Input/Output Units or one 8101 and/or one 8809 Magnetic Tape Unit mdl 1B directly to the 8130. **Maximum:** One per 8130. **Field installation:** Yes.

CCITT V.35 INTERFACE (#1550). Provides interface for data transmission over direct connection at speeds up to 9600 bps. **Maximum:** One per selected communications feature (#1601 or #1602). **Field Installation:** Yes. **Prerequisite:** SDLC Communications with Clock (#1601), SDLC Communications without Clock (#1602) or SDLC Communications without Clock (#1602) and Multi-speed Clock (#5200).

SDLC COMMUNICATIONS WITH BUSINESS MACHINE CLOCK (#1601). Provides control for EIA RS-232-C interface, integrated modems, direct connection and CCITT V.35 interface. **Limitation:** In an 8100 System only ten of these features (#1601 or #1602) may be active at one time. **Maximum:** Two without Feature Expansion Type 1 (#1520) ... with #1520, the maximum is six. **Maximum** is fourteen per 8100 System (see Note 2) with a 8130. The maximum is reduced by one for each communications feature (#1602, 1603, 1604). **Field Installation:** Yes. **Specify:** Code as provided in FAC descriptions in the "Communications Facilities" section.

SDLC COMMUNICATIONS WITHOUT BUSINESS MACHINE CLOCK (#1602). Provides control for EIA RS-232-C or Digital Data Service Adapter interface, CCITT V.35 interface and Loop Adapter. **Limitation:** In an 8100 System only ten of these features (#1601 or #1602) may be active at one time. **Maximum:** Two without Feature Expansion Type 1 (#1520), with #1520, maximum is six. **Maximum** is fourteen per 8100 System (see Note 2) with a 8130. The maximum is reduced by one for each communications feature (#1601, 1603, 1604). **Field Installation:** Yes. **Specify:** Code as provided in FAC descriptions in the "Communications Facilities" section.

BSC/SS COMMUNICATIONS WITH BUSINESS MACHINE CLOCK (#1603). Provides control for EIA RS-232-C interface, integrated modems or direct connection. In an 8100 System the maximum aggregate BSC data rate is 9600 bps and 330 bps for Start/Stop. **Limitation:** Start/Stop communications not available with integrated modems. **Maximum:** Two without Feature Expansion Type 1 (#1520), with #1520 maximum is six. **Maximum** is fourteen per 8100 System (see Note 2) with a 8130. The maximum is reduced by one for each communications feature (#1601, 1602, 1604). **Field installation:** Yes. **Specify:** Code as provided in FAC descriptions in the "Communications Facilities" section.

BSC COMMUNICATIONS WITHOUT BUSINESS MACHINE CLOCK (#1604). Provides control for EIA RS-232-C or Digital Data Service Adapter interface and direct connection. **Limitation:** In an 8100 System the maximum aggregate BSC data rate is 9600 bps. **Maximum:** Two without Feature Expansion Type 1 (#1520), six with #1520. **Maximum** is fourteen per 8100 System (see Note 2) with a 8130. The maximum is reduced by one for each communications feature (#1601, 1602, 1603). **Field installation:** Yes. **Specify:** Code as provided in FAC descriptions in the "Communications Facilities" section.

PROCESSOR STORAGE TYPE 1 (#1710). Provides 128K (131,072) bytes of additional processor storage. **Maximum:** One per 8130. **Limitation:** Not available if Processor Storage Type 2 (#1720) is selected. **Field installation:** Yes.

PROCESSOR STORAGE TYPE 2 (#1720). Provides 256K (262,144) bytes of additional processor storage. **Maximum:** One per 8130. **Limitations:** Not available if Processor Storage Type 1 (#1710) is selected. **Field installation:** Yes.

EIA RS-232-C INTERFACE (#3701). Provides interface to external modems/data communication equipment or direct connection at speeds of up to 9600 bps. **Maximum:** One per selected communications feature (#1601, 1602, 1603 or 1604). **Field installation:** Yes. **Prerequisite:** SDLC Communications with Clock (#1601), SDLC Communications without Clock (#1602), BSC/SS Communications with Clock (#1603), BSC Communications without Clock (#1604), SDLC Communications without Business Machine Clock (#1602) and Multi-speed Clock (#5200), or BSC Communications without Business Machine Clock (#1604) and Multi-speed Clock (#5200). **Specify:** Code as provided in FAC description in the "Communications Facilities" section.

KEYLOCK (#4655). This keylock feature provides processor security by the selection of three modes of operation. These consist of - Disable power on and disable operator panel ... Enable power on but disable operator panel ... Enable power on and enable operator panel. For additional or replacement keys, see M10000 pages. **Maximum:** One. **Field installation:** Yes.

LOOP ADAPTER (#4830). Provides for direct attachment of a single lobe loop at 9600 or 38,400 bps. **Maximum:** Two without Feature Expansion Type 1 (#1520). With #1520, the maximum is six. **Maximum** is fourteen per 8100 System (see Note 2) with a 8130. Only one of these features may operate at 38,400 bps in an 8100 System. **Field installation:** Yes. **Prerequisite:** SDLC Communications without Clock (#1602). **Specify:** Code as provided in FAC description in the "Communications Facilities" section.

LOOP ADAPTER SECOND LOBE (#4835). Provides for the attachment of a separate physical loop cable to extend the coverage and availability of the directly attached loop. **Maximum:** Three per 8130. **Maximum** is five per 8100 System (see Note 2) with a 8130. **Field installation:** Yes. **Prerequisites:** Loop Adapter (#4830) and Feature Expansion Type 1 (#1520). **Specify:** Code as provided in FAC description in the "Communications Facilities" section.

MULTI-SPEED CLOCK (#5200). Provides business machines clocking at 4800 bps and 9600 bps for direct connection. Can provide multiple speeds simultaneously. **Limitation:** Available for port positions three through six only. **Maximum:** One. **Maximum** is three per 8100 System with a 8130. **Field installation:** Yes. **Prerequisites:** Feature Expansion Type 1 (#1520) and either SDLC Communications Feature without Clock (#1602) or BSC Communications Feature without Clock (#1604). **Specify:** Code as provided in FAC description in the "Communications Facilities" section.

MODEM, INTEGRATED, NON-SWITCHED (#5500). Provides interface to common carrier leased facilities at 600 or 1200 bps. **Limitation:** Not available for Start/Stop communication facilities. **Maximum:** One per selected communications feature (#1601 or #1603). **Field installation:** Yes. **Prerequisites:** SDLC Communications Adapter with Clock (#1601) or BSC/SS Communications with Clock (#1603). **Specify:** Code as provided in FAC description in the "Communications Facilities" section.

MODEM, INTEGRATED, SWITCHED (#5501). Provides interface to common carrier switched facilities with Auto Answer at 600 or 1200 bps. **Limitation:** Not available with BSC or Start/Stop communication facilities. **Maximum:** One per selected communications feature (#1601). **Field installation:** Yes. **Prerequisite:** SDLC Communications with Clock (#1601). **Specify:** Code as provided in FAC description in the "Communications Facilities" section.

DIGITAL DATA SERVICE ADAPTER (DDSA) (#5660). Provides interface to AT&T Dataphone** Digital Service Network for transfer of digital data at speeds of 2400, 4800 or 9600 bps. Available for point-to-point line configurations or multipoint line configurations. **Maximum:** One per selected communications feature (#1602 or #1604). **Field installation:** Yes. **Prerequisite:** SDLC Communications without Clock (#1602), or BSC Communications without Clock (#1604). **Specify:** Code as provided in FAC description in the "Communications Facilities" section.

SECURITY COVER LOCKS (#6555). This feature provides key operated security locks for the machine covers, restricting access to the machine interior and external cable connector area. See Security Lock Diskette (#6566) if diskette security is required. Additional or replacement keys are not available from IBM. **Maximum:** One. **Field installation:** Yes.

SECURITY LOCK, DISKETTE (#6566). This feature provides a key operated security lock to restrict access to the diskette magnetic media. It is accessible only by opening the front cover. For maximum system security, the Security Cover Lock (#6555) must be used in addition to the diskette security lock. Additional or replacement keys are not available from IBM. **Maximum:** One. **Field installation:** Yes.

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8130 Processor (cont'd)

NOTE 2: An 8100 System consisting of a 8130 Processor and attached 8101 Storage and Input/Output Unit.

Special Feature Prices	MRC	MLC 2 yr	Purchase	MMMC/ AMMCR
Fea Expansion Type 1 #1520	\$ 14	\$ 12	\$ 405	\$.50
System Expansion 1530	71	60	2,400	10.50
CCITT V.35 Interface 1550	15	13	510	2.00
SDLC Communication Fea				
w Bus Machine Clock 1601	41	35	900	8.00
w/o Bus Machine Clock 1602	35	30	840	7.50
BSC/SS Communication Fea				
w Bus Machine Clock 1603	19	16	670	3.00
BSC Communication Fea				
w/o Bus Machine Clock 1604	12	10	450	2.50
Processor Stor Type 1 1710*	82	70	2,250	7.50
Processor Stor Type 2 1720	165	140	4,500	14.50
EIA RS-232-C Interface 3701	12	10	400	4.00
Keypad 4655	50SUC	-	50	N/C
Loop Adapter 4830	20	17	605	4.00
Loop Adapter 2nd Lobe 4835	20	17	605	4.00
Multi-speed Clock 5200	13	11	420	1.50
Modem, Integrated,				
Non-switched 5500	19	16	668	5.00
Switched 5501	25	21	840	6.50
DDSA 5660	24	20	840	2.00
Security Cover Locks 6555	35SUC	-	35	N/C
Security Lock Diskette 6566	30SUC	-	30	N/C

* Customers who elect to purchase one of these features and anticipate later ordering additional storage should consider purchase of the larger storage initially because field upgrade requires replacement of the initial feature.

COMMUNICATION CAPABILITIES

There is a variety of communication capabilities (see M 2700 pages) supported by the 8130 Features for Attaching Communications (FAC) differing in speed, protocol and attachment interfaces. These FAC codes have been categorized as Loop, SDLC, BSC and Start/Stop. The user should select the desired communication FAC code and refer to the full special feature description and the FAC code description (identified by the abbreviation FAC NO.) for additional details. Reference to switched communications in the FAC codes refers to the communications link between the 8100 System and the S/370 or 4300 Processors.

The 8130 special features allow a maximum of six communication capabilities to be configured and designated as communication ports. Each communication port position (1 thru 6) must consist of a communications feature for SDLC, BSC or Start/Stop.

The SDLC communications feature is available with and without business machine clock (#1601, 1602). The BSC/SS communications feature (#1603) is available with business machine clock and the BSC Communications Feature (#1604) is available without business machine clock. If an 8130 communications port is to provide the attached facility with business machine clock at speeds greater than 2400 bps the Multi-speed Clock feature (#5200) is required. One Multi-speed Clock feature (#5200) can provide business machine clocking at speeds greater than 2400 bps to any or all of port positions three thru six.

In addition to selecting a communications feature (#1601, 1602, 1603, 1604) for each port configured in an 8130, a communication interface or integrated modem must be selected to support the communication facility attaching to that port. A two lobe loop port requires three special features (#1602, #4830 and #4835) in addition to Feature Expansion Type 1 (#1520). Direct connect at 4800 and 9600 bps require the Multi-speed Clock feature (#5200) and the Feature Expansion Type 1 (#1520) if the 8130 supplies the business machine clock. Each port of the 8130 requires the selection of a specify code to indicate the System 8100 FAC code selected for that port. Certain System 8100 FAC codes will require a second specify code to select options available within that facility: 2/4 wire, line speed or multipoint control/tributary.

NOTE: The selected option specified within a given FAC and specific port position can be changed in the field by Field Engineering. All such changes are chargeable at the applicable FE hourly rate.

Specify and FAC Code Descriptions:

A specify code number is required to identify the selected FAC code and its physical port position. The specify code is constructed by concatenating the selected FAC and its port position to the numeral 9, e.g.:

#9ABC where AB = FAC No. ... C = Port Position.

FAC codes range in number from 08 to 61 resulting in FAC specify codes ranging in number from #9081 to #9616. Additional

codes must be specified for selected options. These codes are outlined in the FAC code descriptions. No two FAC codes can occupy the same port position. Configuration Manual GA27-2876 will aid in assigning the port positions.

- - - LOOP - - -

FAC No.	FAC Code Description
SDLC	
FAC 8	Loop, high speed single lobe at 38,400 bps
FAC 9	Loop, high speed two lobe at 38,400 bps
FAC 10	Loop, single lobe at 9600 bps
FAC 11	Loop, two lobes at 9600 bps

FAC 8 - Loop, High Speed, Single Lobe -- Required for operating a loop at 38,400 bps. **Limitations:** Not available with FAC 09 Loop, High Speed, Two Lobe (#9094 thru #9096) and FAC 21 and 29. Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1602 and #4830. **Maximum:** One per 8130. Maximum one per 8100 System. **Specify:** From the table below, specify the required code to complete the configuration for the port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9081	#9082	#9083	#9084	#9085	#9086

FAC 9 - Loop, High Speed, Two Lobe -- Required for operating a two lobe loop at 38,400 bps. **Limitations:** Not available with FAC 08 Loop, High Speed, Single Lobe (#9081 thru #9086) and FAC 21 and 29. Available for ports 4, 5 or 6 only. **Prerequisites:** #1520, #1602, #4830 and #4835. **Maximum:** One per 8130. Maximum one per 8100 System. **Specify:** From the table below, specify the required code to complete the configuration for the port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	N/A	N/A	N/A	#9094	#9095	#9096

FAC 10 - Loop, Single Lobe -- Required for operating a loop at 9600 bps. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1602 and #4830. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9101	#9102	#9103	#9104	#9105	#9106

FAC 11 - Loop, Two Lobe -- Required for operating two lobe loops at 9600 bps. **Limitation:** Available for port positions 4, 5 or 6 only. **Prerequisites:** #1520, #1602, #4830 and #4835. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	N/A	N/A	N/A	#9114	#9115	#9116

- - - SDLC - - -

FAC No.	FAC Code Description
EIA RS-232-C	
FAC 12	600 or 1200 bps (external modem)
FAC 13	Up to 9600 bps (external modem)
FAC 15	600, 1200 or 2400 bps direct connect with clock (no modem)
FAC 16	4800 or 9600 bps direct connect with clock (no modem)
FAC 17	Direct connect without clock
Integrated Modem	
FAC 18	600 or 1200 bps non-switched
FAC 19	600 or 1200 bps switched w Auto Answer
AT&T Dataphone Digital Service	
FAC 20	2400, 4800 or 9600 bps non-switched
CCITT V.35	
FAC 24	Direct connect with clock (no modem) 600, 1200 or 2400 bps
FAC 25	Direct connect with clock (no modem) 4800 or 9600 bps
FAC 27	Direct connect without clock (no modem) 9600 bps

FAC 12 - EIA RS-232-C Interface -- 600 or 1200 bps with business machine clock ... operating with external modem without clocking ... and point-to-point switched 2 wire ... or point-to-point non-switched 2 or 4 wire ... or multipoint 4 wire. **Limitation:** Re-



8130 Processor (cont'd)

quires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1601 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9121	#9122	#9123	#9124	#1925	#1926
600 bps	9741	9742	9743	9744	9745	9746
1200 bps	9751	9752	9753	9754	9755	9756

FAC 13 - EIA RS-232-C Interface -- Up to 9600 bps without business machine clock ... with external data communication equipment and clock ... point-to-point switched with auto answer to 4800 bps ... or point-to-point non-switched 2 or 4 wire ... or multipoint 4 wire. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1602 and #3701. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9131	#9132	#9133	#9134	#9135	#9136

FAC 15 - EIA RS-232-C Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal or 8100 System must not provide business machine clock) and direct connection up to 40 feet. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1601 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9151	#9152	#9153	#9154	#9155	#9156
600 bps	9741	9742	9743	9744	9745	9746
1200 bps	9751	9752	9753	9754	9755	9756
2400 bps	9761	9762	9763	9764	9765	9766

FAC 16 - EIA RS-232-C Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem (attached downstream terminal must not provide machine clock) ... and direct connection up to 40 feet. **Prerequisites:** #1520, #1602, #3701 and #5200. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	N/A	N/A	#9163	#9164	#9165	#9166
4800 bps	N/A	N/A	9773	9774	9775	9776
9600 bps	N/A	N/A	9783	9784	9785	9786

FAC 17 - EIA RS-232-C Interface -- up to 9600 bps without business machine clock ... operating with other 8100 System (with business machine clock) ... and direct connection up to 40 feet. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1602 and #3701. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9171	#9172	#9173	#9174	#9175	#9176

FAC 18 - Integrated Modem -- 600 or 1200 bps ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1601 and #5500. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9181	#9182	#9183	#9184	#9185	#9186
2 wire						
600 bps	9851	9852	9853	9854	9855	9856
1200 bps	9861	9862	9863	9864	9865	9866
4-wire						
600 bps	9741	9742	9743	9744	9745	9746
1200 bps	9751	9752	9753	9754	9755	9756

FAC 19 - Integrated Modem -- 600 or 1200 bps ... point-to-point switched with auto answer 2 wire. **Prerequisites:** #1601 and #5501. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9191	#9192	#9193	#9194	#9195	#9196
600 bps	9741	9742	9743	9744	9745	9746
1200 bps	9751	9752	9753	9754	9755	9756

FAC 20 - Digital Network Interface (to AT&T Dataphone Digital Service) -- 2400, 4800, 9600 bps without business machine clock ... and 4 wire point-to-point non-switched ... or multipoint non-switched. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1602 and #5660. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9201	#9202	#9203	#9204	#9205	#9206
Point-to-point or Multipoint Control						
2400 bps	9001	9002	9003	9004	9005	9006
4800 bps	9021	9022	9023	9024	9025	9026
9600 bps	9041	9042	9043	9044	9045	9046
Multipoint Tributary						
2400 bps	9011	9012	9013	9014	9015	9016
4800 bps	9031	9032	9033	9034	9035	9036
9600 bps	9051	9052	9053	9054	9055	9056

FAC 24 - CCITT V.35 Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem ... and direct connection up to 1000 feet. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1601 and #1550. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9241	#9242	#9243	#9244	#9245	#9246
600 bps	9741	9742	9743	9744	9745	9746
1200 bps	9751	9752	9753	9754	9755	9756
2400 bps	9761	9762	9763	9764	9765	9766

FAC 25 - CCITT V.35 Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem ... and direct connection up to 1000 feet. **Prerequisites:** #1520, #1602, #1550 and #5200. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	N/A	N/A	#9253	#9254	#9255	#9256
4800 bps	N/A	N/A	9773	9774	9775	9776
9600 bps	N/A	N/A	9783	9784	9785	9786

FAC 27 - CCITT V.35 Interface -- Up to 9600 bps without business machine clock ... operating with other 8100 System (with business machine clock) ... and direct connection up to 1000 feet. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1602 and #1550. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9271	#9272	#9273	#9274	#9275	#9276

- - - BSC - - -

FAC No. FAC Code Description

EIA RS-232-C	
FAC 40	600 or 1200 bps - external modem
FAC 41	Up to 9600 bps - external modem
FAC 43	600, 1200 or 2400 bps direct connect with clock (no modem)
FAC 44	4800 or 9600 bps direct connect with clock (no modem)

Integrated Modem	
FAC 45	600 or 1200 bps non-switched

AT&T Dataphone Digital Service	
FAC 47	2400, 4800 or 9600 bps non-switched

FAC 40 - EIA RS-232-C Interface -- 600 or 1200 bps with business machine clock ... operating with external modem with no clock ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9401	#9402	#9403	#9404	#9405	#9406
600 bps	9741	9742	9743	9744	9745	9746
1200 bps	9751	9752	9753	9754	9755	9756



8130 Processor (cont'd)

FAC 41 - EIA RS-232-C Interface - Up to 9600 bps without business machine clock ... operating with external data communication equipment ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1604 and #3701. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9411	#9412	#9413	#9414	#9415	#9416

FAC 43 - EIA RS-232-C Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal must not provide business machine clock) and direct connection up to 40 feet. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9431	#9432	#9433	#9434	#9435	#9436
600 bps	9741	9742	9743	9744	9745	9746
1200 bps	9751	9752	9753	9754	9755	9756
2400 bps	9761	9762	9763	9764	9765	9766

FAC 44 - EIA RS-232-C Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem (attached downstream terminal must not provide business machine clock) ... and direct connection up to 40 feet. **Prerequisites:** #1520, #1604, #3701 and #5200. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	N/A	N/A	#9443	#9444	#9445	#9446
4800 bps	N/A	N/A	9773	9774	9775	9776
9600 bps	N/A	N/A	9783	9784	9785	9786

FAC 45 - Integrated Modem -- 600 or 1200 bps ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1603 and #5500. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9451	#9452	#9453	#9454	#9455	#9456
2-wire						
600 bps	9851	9852	9853	9854	9855	9856
1200 bps	9861	9862	9863	9864	9865	9866
4-wire						
600 bps	9741	9742	9743	9744	9745	9746
1200 bps	9751	9752	9753	9754	9755	9756

FAC 47 - Digital Network Interface (to AT&T Dataphone Digital Service) -- 2400, 4800 or 9600 bps without business machine clock ... 4 wire point-to-point non-switched ... or multipoint non-switched. **Limitation:** Requires feature expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1604 and #5660. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9471	#9472	#9473	#9474	#9475	#9476
Point-to-point or Multipoint Control						
2400 bps	9001	9002	9003	9004	9005	9006
4800 bps	9021	9022	9023	9024	9025	9026
9600 bps	9041	9042	9043	9044	9045	9046
Multipoint Tributary						
2400 bps	9011	9012	9013	9014	9015	9016
4800 bps	9031	9032	9033	9034	9035	9036
9600 bps	9051	9052	9053	9054	9055	9056

--- START/STOP ---

FAC No.	FAC Code	Description
EIA RS-232-C		
FAC 60		110, 134.5, 150 or 300 bps (external modem)
FAC 61		110, 134.5, 150 or 300 bps direct connect with clock (no modem)

FAC 60 - EIA RS-232-C Interface -- 134.5 or 300 bps with busi-

ness machine clock ... operating with external modem... and point-to-point non-switched facilities. See M 2700 pages for specific information on communication facilities and other attachment information.

Also 110 or 150 bps with business machine clock ... operating with external modem ... and point-to-point non-switched facilities will be provided under provisions of the IBM Multiple Supplier System Policy. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9601	#9602	#9603	#9604	#9605	#9606
110 bps	9701	9702	9703	9704	9705	9706
134.5 bps	9711	9712	9713	9714	9715	9716
150 bps	9721	9722	9723	9724	9725	9726
300 bps	9731	9732	9733	9734	9735	9736

FAC 61 - EIA RS-232-C Interface -- 110, 134.5, 150 or 300 bps with business machine clock ... operating with no modem (the attached terminal must provide its own business machine clock) ... and direct connection to 40 feet. **Limitation:** Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
Port	#9611	#9612	#9613	#9614	#9615	#9616
110 bps	9701	9702	9703	9704	9705	9706
134.5 bps	9711	9712	9713	9714	9715	9716
150 bps	9721	9722	9723	9724	9725	9726
300 bps	9731	9732	9733	9734	9735	9736

HOST AND TERMINAL MODEM ATTACHMENT

For communication facilities and modem attachment data, see the M 2700 pages and appropriate machine pages.

- 1200 bps integrated modem, switched and non-switched
- Dataphone Digital Service Adapter
- 3863 Modem, switched and non-switched
- 3864 Modem, switched and non-switched
- 3865 Modem, non-switched
- 3872 Modem, switched and non-switched
- 3874 Modem, switched and non-switched
- 3875 Modem, non-switched

DIRECT CONNECTION ATTACHMENT

In addition to terminal attachment to the 8100 System through common carrier facilities (see M 2700 pages) or local loops, attachment can be made by direct connect. The direct connect is made by using the SDLC (FAC 15 or 16), BSC (FAC 43 or 44) and Start/Stop (FAC 61). Shown below are the direct connect attachable devices and required device feature numbers. The IBM 8100 Information System Installation Manual - Physical Planning GA27-2877 will assist in the selection of direct connect cables.

FAC Code	Attach Device	Speeds (bps)	Device Feature No.
15	3276	600, 1200, 2400	#3701, w/#9491 and #6302
16	3276	4800, 9600	#3701, w/#9491 and #6302
15	3767	600, 1200, 2400	#3718, w/#9707, #9533
61	2741	134.5	#9115 or #9120
15, 24	8130/8140/8101	600, 1200, 2400	#3701 (FAC 17) or #1550 (FAC 27) and #1602
	8775-11, 12	600, 1200, 2400	#3701 (FAC 15) or #1550 (FAC 24)
16, 25	8130/8140	4800, 9600	#3701 (FAC 17) or #1550 (FAC 27) and #1602
	8775-11, 12	4800, 9600	#3701 (FAC 16) or #1550 (FAC 25)
43	2789/3780 Line protocol	600, 1200, 2400	Refer to specific device See Note 3
44	2780/3780 Line Protocol	400, 9600	Refer to specific device See Note 3

NOTE 3: For attachment of devices that conform to 2780/3780 line protocol.

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**IBM 8140 PROCESSOR**

Purpose: Provides control, storage, processing capability, disk and diskette storage and device attachment capabilities for the IBM 8100 Information System.

Model	Base Processor Storage (bytes)	Non Removable Disk Capacity (million bytes)	Fixed Head Capacity (bytes)
A31	256K (262,144)	29MB (29,327,360)	None
A32	256K (262,144)	23MB (23,461,888)	131,072
A33	256K (262,144)	64MB (64,520,192)	None
A34	256K (262,144)	58MB (58,654,720)	131,072
A41	320K (327,680)	29MB (29,327,360)	None*
A42	320K (327,680)	23MB (23,461,888)	131,072*
A43	320K (327,680)	64MB (64,520,192)	None*
A44	320K (327,680)	58MB (58,654,720)	131,072*
A51	512K (524,288)	29MB (29,327,360)	None
A52	512K (524,288)	23MB (23,461,888)	131,072
A53	512K (524,288)	64MB (64,520,192)	None
A54	512K (524,288)	58MB (58,654,720)	131,072

* These models include Floating Point Arithmetic.

Maximum: One per 8100 Information System.

Highlights: The 8140 Processor is a multi-level, interrupt driven processor which provides control, processing capability, process storage, disk and diskette storage and communications features for the 8100 information System. The flexibility offered by the 8140 allows the user to configure a system for initial requirements, while retaining the ability to modify the system to meet future needs.

System control and processing is provided by machine program instructions. The 8140 mdl A41 thru A44 also includes additional instructions for floating point arithmetic. Eight I/O interrupt levels provide for interrupt processing. The 8140 offers various amounts of processor storage of which 4,096 bytes are read only storage and not available for user programs. Processor storage can be expanded up to a maximum of 384K (393,216) for the model A31 thru 34. Fixed amounts of 320K (327,680) bytes for the model A41 thru A44 and 512K (524,288) bytes for the model A51 thru A54. Capability for dynamic addressing and storage protection for up to 4 million bytes of logical storage is also available.

The 8140 allows for the attachment of up to four 8101 Storage and Input/Output Units two of which may be configured with Communication and Display/Printer Feature Type I or Type II, or three 8101 Storage and Input/Output Units and one 8809 Magnetic Tape Unit mdl 1B. An alternate configuration can consist of a 8140, four 8101 Storage and Input/Output Units, and one 8809 Magnetic Tape Unit mdl 1A. Up to three additional 8809 Magnetic Tape Units can be attached to the 8809 Magnetic Tape Unit mdl 1A or 1B.

The 8140 Processor is provided with fixed high speed direct access storage. Depending on the 8140 model selected, disk storage of up to 64 million bytes with movable heads or up to 58 million bytes of disk storage with movable and fixed heads is available. The disk storage operates at a data rate of 1.031 million bytes per second. The average access time is 27 milliseconds with an average rotational delay of 9.6 milliseconds. Removable diskette storage is available with up to 1MB (985,088) of storage operating at up to 62K bytes per second data rate. The diskette drive can read/write in basic data exchange format on either the IBM Diskette 2D or the IBM Diskette Type 1.

The 8100 System can attach to any S/370 or 4300 Processors via the 3704/3705 for SNA/SDLC or BSC line control. The 8100 System attaches to the ICA of the 115, 125, 135 or 138 processors for BSC line control. The IBM 8100 System can attach to the Communications Adapter of the 4331 Processor for BSC and/or SDLC line control. For specific attachment see M 2700 pages.

The capability of the 8100 Information System is further extended by providing for the attachment of a variety of input/output devices. These devices may be attached to the 8140 via communication features which include data link, direct connect, and loops that are direct attached or data link attached. The number of communication ports that can be attached to the 8140 is three for the model A31 thru A34 and two for the model A41 thru A44. The 8140 mdl A51 thru A54 requires the 8101 Storage and Input/Output Unit for the attachment of communication ports.

Communication Attached Devices -- Devices that can be attached to the communication ports are the -- 3276 Control Unit Display Station mdls 1, 2, 3, 4, 11, 12, 13, 14 with 3278 Display Station mdls 1, 2, 3, 4, 3287 Printer mdls 1, 2, and 3289 Line Printer mdls 1, 2 -- 3767 Communication Terminal mdls 1, 2, 3 -- 3631 Plant Communication Controller mdls 1A, 1B -- 3632 Plant Communication Controller mdls 1A, 1B -- 8775 Display Terminal mdls 11 and 12 -- 2741 Communications Terminal -- TTY 33/35 or equivalent

lent -- non-IBM terminals conforming to the 2780/3780 line protocol -- 3842 Loop Control Unit -- 8130 Processor -- 8140 Processor -- 8101 Storage and Input/Output Unit.

Loop Attached Devices at 2400 or 9600 bps -- Devices that can be attached to a direct attached loop at 9600 bps or data link attached loop at 2400 bps are the -- 3287 Printer mdls 11, 12 -- 3289 Printer mdl 3 with 3501 Card Reader and via the 3782 Card Attachment Unit the 3521 Card Punch and 2502 Card Reader mdl A1 (see Note 1) -- 3276 Control Unit Display Station mdls 11, 12, 13, 14 with 3278 Display Station mdls 1, 2, 3, 4, 3287 Printer mdls 1, 2, 3289 Line Printer mdls 1, 2 -- 8775 Display Terminal mdls 11 and 12 -- 3641 Reporting Terminal mdls 1, 2 -- 3642 Endorser Printer mdls 1, 2 -- 3643 Keyboard Display mdls 2, 3, 4 -- 3644 Automatic Data Unit -- 3645 Printer -- 3646 Scanner Control Unit -- 3647 Time and Attendance Terminal.

Loop Attached Devices at 38,400 bps -- Devices that can be attached to a direct attached loop at 38,400 bps are the -- 3287 mdls 11 and 12, 8775 Display Terminal mdls 11 and 12.

Direct Attached Devices -- Devices that can be attached directly to the processor are the -- 8101 Storage and Input/Output Unit, 8809 Magnetic Tape Unit mdl 1B.

Note 1: Dedication of a 9600 bps single lobe loop to the attachment of the 3289 mdl 3 printer should be considered in cases where the printer will be heavily utilized.

Customer Set-up: The 8140 Processor is designated as a customer set-up unit thereby offering the customer early availability and relocation flexibility. Aids and configurators are provided to facilitate the configuration and ordering of the 8140. Set-up procedures for the customer will be shipped with each machine. An 8140 installation verification program will be shipped with each machine on a diskette. A clear indication that the machine is operational will be given.

If the user relocates and/or interchanges attaching units from one system to another, the user must consider priority and address compatibility of the processor and its attachments.

Prerequisites: None.

Bibliography: Available at a later date.

Color: Pebble gray is the only available color.

Specify: [1] Voltage (120 VAC, 1-phase, 3-wire, 60Hz): Specify #9891 for non-lock plug, or #9890 for locking plug. If 4.3 meter (14 ft) power cable is not desired, specify #9986 for 1.8 meter (6 ft) cable.

[2] Cabling: For cabling information see Accessories pages (M10000), appropriate 8100 Information System installation manuals and Processor Site Preparation Guides.

[3] Programming Configuration: Specify #9700 for Distributed Processing Programming Executive (DPPX), #9710 for Distributed Processing Control Executive (DPCX), #9720 for DPPX and DPCX, or #9730 for all other configurations.

[4] Terminal Requirements: Specify #9800 (off line 3640 terminal exercisor) if ordering any of the following terminals: 3641, 3642, 3643, 3644, 3645, 3646 or 3647 -

- 1) On the initial order.
- 2) When the first terminal is ordered to attach via an 8101, and none are attached to the processor.
- 3) when the first terminal is field installed on an 8100 System.

Maximum: One per 8100 System. **Field installation:** Yes.

PRICES:	Mdl	MRC	MLC 2 yr	Purchase	MMMC/ AMMCR
8140	A31	\$1,128	\$ 960	\$33,060	\$173
	A32	1,152	980	33,780	181
	A33	1,175	1,000	34,500	181
	A34	1,199	1,020	35,220	189
	A41	1,416	1,205	40,260	212
	A42	1,439	1,225	40,980	220
	A43	1,463	1,245	41,700	220
	A44	1,486	1,265	42,420	228
	A51	1,739	1,480	45,540	233
	A52	1,763	1,500	46,260	241
	A53	1,786	1,520	46,980	241
	A54	1,810	1,540	47,700	249

Rental Plan: Plan D Machine Group: A
Useful Life Category: 2 Purchase Option: 55% Per Call: 1
Warranty: B Initial Period of Maintenance Service: 3 mos.
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Model upgrades are available, however, model changes from 8140-A3X to 8140-A4X are not recommended for field installation. For model changes that require replacement of disk storage unit, adequate provisions must be made for retaining



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data contained in disk storage and elimination of user-proprietary information.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges for the following model upgrades)

From	To Mdl*		
	A32	A33	A34
A31	\$2,200	\$2,500	\$3,000
A32		2,300	2,800
A33			2,500
	A42	A43	A44
A41	\$2,200	\$2,500	\$3,000
A42		2,300	2,800
A43			2,500
	A52	A53	A54
A51	\$2,200	\$2,500	\$3,000
A52		2,300	2,800
A53			2,500

* Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model change involves the removal of parts which become the property of IBM."

For all other model changes the purchase customer must submit an RPQ.

SPECIAL FEATURES

Performance: The maximum number of Features for Attaching Communications (FAC) capable of concurrent operation is a function of the speed of the line, communication facilities, the operating system installed and the application work load. The maximum number of communication features which can be physically installed can exceed the operational capability. Increased processor utilization will result from sustained operation of BSC at the maximum aggregate data rate and may cause degradation of activity operating at lower priority levels. Analysis should be performed to determine the impact.

Diagnostics: The 8100 System hardware and feature operation, diagnostic support and maintenance support described in 8100 System publications are dependent on the presence of functional support modules provided by DPPX or DPCX. Operational and maintenance conditions for the 8100 System are predicated on the presence of these functional support modules. Customers ordering 8100 System hardware without DPPX or DPCX should provide the functional support as contained and described in the Functional Definition Manual 8100 which will be available at FCS.

STORAGE INCREMENT 128K (#1490). Provides 131,072 bytes of additional processor storage. The ordering of the additional quantities of this feature will allow the expansion of the 8140 mdl A31 thru A34 storage up to a maximum of 393,216 bytes. **Maximum:** One for 8140 mdl A31 thru A34. **Field Installation:** Yes.

CCITT V.35 INTERFACE (#1550). Provides interface to External Modems/Data Communication equipment to 56,000 bps or Direct Connection at speeds of up to 9600 bps. **Maximum:** For speeds up to 9600 bps one per selected communications feature (#1601 or #1602). For operation at 56,000 bps one per 8140 Processor, one per 8100 System. Not available with FAC codes 8, 9 and 21. **Field Installation:** Yes. **Prerequisites:** SDLC Communications with Clock (#1601), SDLC Communications without Clock (#1602) and Multi-speed Clock (#5200). **Specify:** Code as provided in FAC description in the "Communication Capabilities" section.

SDLC COMMUNICATIONS WITH BUSINESS MACHINE CLOCK (#1601). Provides control for EIA RS-232-C interface, integrated modems, direct connection and CCITT V.35 interface. **Limitation:** Not available with the Expanded Function Operator Panel (#4545) on the 8140 mdl A41 thru A44. Not available with the 8140 mdl A51 thru A54. In an 8100 System only ten of these features (#1601 or #1602) may be active at one time. **Maximum:** Three with the 8140 mdl A31 thru A34 and two with the mdl A41 thru A44. Maximum is nineteen per 8100 System (see Note 2) with a 8140 mdl A31 thru A34, eighteen with a 8140 mdl A41 thru A44, or sixteen with the 8140 mdl A51 thru A54. The maximum is reduced by one for each communications feature (#1602, 1603 or 1604) selected. **Field installation:** Yes. **Specify:** Code as provided in FAC descriptions in the "Communication Facilities" section.

SDLC COMMUNICATIONS WITHOUT BUSINESS MACHINE CLOCK (#1602). Provides control for EIA RS-232-C or Digital Data Service Adapter (DDSA) interface, CCITT V.35 interface and Loop Adapter. **Limitation:** Not available with the Expanded Function Operator Panel (#4545) on the 8140 mdl A41 thru A44. Not available with the 8140 mdl A51 thru A54. In an 8100 System

only ten of these features (#1601 or #1602) may be active at one time. **Maximum:** Three with 8140 mdl A31 thru A34 and two with mdl A41 thru A44. Maximum is nineteen per 8100 System (see Note 2) with a 8140 mdl A31 thru A34, eighteen with a 8140 mdl A41 thru A44, or sixteen with a 8140 mdl A51 thru A54. The maximum is reduced by one for each communications feature (#1601, 1603 or 1604) selected. **Field installation:** Yes. **Specify:** Code as provided in FAC descriptions in the "Communication Facilities" section.

BSC/SS COMMUNICATIONS WITH BUSINESS MACHINE CLOCK (#1603). Provides control for EIA RS-232-C interface, integrated modems or direct connection. **Limitation:** Start/Stop communications are not available with integrated modems. Not available with the Expanded Function Operator Panel (#4545) on the 8140 mdl A41 thru A44. Not available with the 8140 mdl A51 thru A54. In an 8100 System the maximum aggregate BSC data rate is 19,200 bps and 660 bps for Start/Stop. **Maximum:** Three with 8140 mdl A31 thru A34 and two with 8140 mdl A41 thru A44. Maximum is nineteen per 8100 System (see Note 2) with a 8140 mdl A31 thru A34, eighteen with a 8140 mdl A41 thru A44, or sixteen with a 8140 mdl A51 thru A54. The maximum is reduced by one for each communications feature (#1601, 1602 or 1604) selected. **Field installation:** Yes. **Specify:** Code as provided in FAC descriptions in the "Communication Facilities" section.

BSC COMMUNICATIONS WITHOUT BUSINESS MACHINE CLOCK (#1604). Provides control for EIA RS-232-C or Digital Data Service Adapter (DDSA) interface and direct connection. **Limitation:** Not available with the Expanded Function Operator Panel (#4545) on the 8140 mdl A41 thru A44. Not available with 8140 mdl A51 thru A54. In an 8100 System the maximum aggregate BSC data rate is 19,200 bps. **Maximum:** Three with 8140 mdl A31 thru A34 and two with mdl A41 thru A44. Maximum is nineteen per 8100 System (see Note 2) with a 8140 mdl A31 thru A34, eighteen with a 8140 mdl A41 thru A44, or sixteen with a 8140 mdl A51 thru A54. The maximum is reduced by one for each communications feature (#1601, 1602, 1603) selected. **Field installation:** Yes. **Specify:** Code as provided in FAC descriptions in the "Communication Facilities" section.

EIA RS-232-C INTERFACE (#3701). Provides interface to external modems/data communication equipment or direct connection at speeds of up to 9600 bps. **Maximum:** One per selected communications feature (#1601, 1602, 1603, 1604). **Field installation:** Yes. **Prerequisites:** SDLC Communications with Clock (#1601), SDLC Communications without Clock (#1602), BSC/SS Communications with Clock (#1603), BSC Communications without Clock (#1604), SDLC Communications without Clock (#1602) and Multi-speed Clock (#5200), BSC Communications without Business Machine Clock (#1604) and Multi-speed Clock (#5200). **Specify:** Code as provided in FAC descriptions in the "Communication Facilities" section.

EXPANDED FUNCTION OPERATOR PANEL (#4545). This feature provides operator access to processor storage, program stop and restart capability and current operating indicators. **Limitations:** Not available on a 8140 mdl A41 thru A44 with SDLC or BSC/SS Communications (#1601, 1602, 1603, 1604), Loop Adapter (#4830), or the 8140 mdl A51 thru A54. **Maximum:** One. **Field installation:** Yes.

KEYLOCK (#4655). This keylock feature provides processor security by the selection of three modes of operation. These consist of -- Disable power on and operator panel functions ... Enable power on but disable operator panel ... Enable power on and full operator panel functions. For additional or replacement keys, see M10000 pages. **Maximum:** One. **Field installation:** Yes.

LOOP ADAPTER (#4830). Provides for the direct attachment of a single lobe loop at 9600 or 38,400 bps. **Limitations:** Not available with the Expanded Function Operator Panel (#4545) on the 8140 mdl A41 thru A44. Not available with the 8140 mdl A51 thru A54. **Maximum:** Three with 8140 mdl A31 thru A34 and two with mdl A41 thru A44. Maximum is nineteen per 8100 System (see Note 2) with a 8140 mdl A31 thru A34, eighteen with 8140 mdl A41 thru A44, or sixteen with a 8140 mdl A51 thru A54. Only one of these features may operate at 38,400 bps in an 8100 System. The maximum is reduced by one for each selected communications facility attached to the 8140. **Field installation:** Yes. **Prerequisite:** SDLC Communications without Clock (#1602). **Specify:** Code as provided in FAC descriptions in the "Communication Facilities" section.

LOOP ADAPTER SECOND LOBE (#4835). Provides for the attachment of a separate physical loop cable to extend the coverage and availability of the directly attached loop. **Limitation:** Not available with 8140 mdl A51 thru A54. **Maximum:** Two per 8140 mdl A31 thru A34 and mdl A41 thru A44. Maximum is six per 8100 System (see Note 2) with the 8140 mdl A31 thru A34 and mdl A41 thru A44, or four with 8140 mdl A51 thru A54. **Field installation:** Yes. **Prerequisite:** Loop Adapter (#4830). **Specify:** Code as provided in FAC descriptions in the "Communication Facilities" section. **Loop Accessories and Wire:** See M10000



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pages for pricing and ordering instructions.

NOTE 2: An 8100 System consisting of an 8140 Processor and attached 8101 Storage and Input/Output Unit.

MULTI-SPEED CLOCK (#5200). Provides business machine clocking at 4800 bps and 9600 bps for direct connection facilities. Can provide multiple speeds simultaneously. **Limitation:** Not available with the 8140 mdl A51 thru A54. **Maximum:** One per 8140 mdl A31 thru A34 and mdl A41 thru A44. Maximum is five per 8100 System with the 8140 mdl A31 thru A34 and A41 thru A44, or four with the 8140 mdl A51 thru A54. **Field installation:** Yes. **Prerequisites:** SDLC Communications without Business Machine Clock (#1602), or BSC Communications without Business Machine Clock (#1604). **Specify:** Code as provided in FAC descriptions in the "Communication Facilities" section.

MODEM, INTEGRATED, NON-SWITCHED (#5500). Provides interface to common carrier leased facilities at 600 or 1200 bps. **Limitation:** Not available for Start/Stop communication facilities. **Maximum:** One per selected communications feature (#1601 or #1603). **Field installation:** Yes. **Prerequisite:** SDLC Communications Adapter with Clock (#1601), or BSC/SS Communications with Clock (#1603). **Specify:** Code as provided in FAC descriptions in the "Communication Facilities" section.

MODEM, INTEGRATED, SWITCHED (#5501). Provides interface to common carrier switched facilities with auto answer at 600 or 1200 bps. **Limitation:** Not available with BSC and Start/Stop communication facilities. **Maximum:** One per selected communications feature (#1601). **Field installation:** Yes. **Prerequisite:** SDLC Communications with Clock (#1601). **Specify:** Code as provided in FAC descriptions in the "Communication Facilities" section.

DIGITAL DATA SERVICE ADAPTER (DDSA) (#5660). Provides interface to AT&T Dataphone* Digital Service Network for transfer of digital data at speeds of 2400, 4800, 9600 in point-to-point or multipoint configurations, or 56,000 bps in point-to-point configurations. **Maximum:** For speeds up to 9600 bps one per selected communications feature (#1602 or #1604). For operation at 56,000 bps one per 8140 Processor, one per 8100 System. Not available with FAC code 8, 9 or 29. **Field installation:** Yes. **Prerequisites:** SDLC Communications without Clock (#1602) for operation to 56,000 or BSC Communications without Clock (#1604) for operation to 9600 bps. **Specify:** Code as provided in FAC description in "Communication Capabilities" section.

SECURITY COVER LOCKS (#6555). This feature provides key operated security locks for the machine covers, restricting access to the machine interior and external cable connector area. See Security Lock Diskette (#6566) if diskette security is required. Additional or replacement keys are not available from IBM. **Maximum:** One. **Field installation:** Yes.

SECURITY LOCK, DISKETTE (#6566). This feature provides a key operated security lock to restrict access to the diskette magnetic media. It is accessible only by opening the front cover. For maximum security, the Security Cover Lock (#6555) must be used in addition to the diskette security lock. Additional or replacement keys are not available from IBM. **Maximum:** One. **Field installation:** Yes.

Special Feature Prices:	MRC	MLC 2 yr	Purchase	MMMC/ AMMCR
Storage Increment 128K#1490	\$306	\$260	\$6,240	\$30.00
CCITT V.35 Interface 1550	15	13	510	2.00
SDLC Communications				
w Bus Machine Clock 1601	41	35	900	8.00
w/o Bus Machine Clock 1602	35	30	840	7.50
BSC/SS Communications				
w Bus Machine Clock 1603	19	16	670	3.00
BSC Communications				
w/o Bus Machine Clock 1604	12	10	450	2.50
EIA RS-232-C Interface 3701	12	10	400	4.00
Exp Funct Opertr Panel 4545	82	70	2,400	30.50
Keylock 4655	50SUC -		50	N/C
Loop Adapter 4830	20	17	605	4.00
Loop Adapter 2nd Lobe 4835	20	17	605	4.00
Multi-speed Clock 5200	13	11	420	1.50
Modem, Int, Non-switch 5500	19	16	668	5.00
Modem, Int, Switched 5501	25	21	840	6.50
DDSA 5660	24	20	840	2.00
Security Cover Locks 6555	35SUC -		35	N/C
Security Lock, Diskette 6566	30SUC -		30	N/C

Communication Facilities

There are a variety of communication facilities (see M 2700 pages) supported by the 8140 mdls A31 thru A44 Features for Attaching Communications (FAC) which differ in speed, protocol and attachment interfaces. These FAC codes have been categorized as Loop, SDLC, BSC and Start/Stop. The user should select the desired communication FAC code and refer to the full special

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feature description and the FAC code description (identified by the abbreviation FAC No.) for additional details. Reference to switched communications in the FAC codes refers to the communication link between the 8100 System and the S/370.

The 8140 special features allow a maximum of three communication capabilities to be configured and designated as communication ports. Each communication port position (1 thru 3) must consist of a communications feature for SDLC, BSC or Start/Stop.

The SDLC communications feature is available with and without business machine clock (#1601, 1602). The BSC/SS communications feature (#1603) is available with business machine clock and the BSC communications feature (#1604) is available without business machine clock. If an 8140 communications port is to provide the attached facility with business machine clock at speeds greater than 2400 bps the Multi-speed Clock feature (#5200) is required. One Multi-speed Clock feature (#5200) can provide business machine clocking at speeds greater than 2400 bps.

In addition to selecting a communications feature (#1601, 1602, 1603, 1604) for each port configured in an 8140, a communication interface or integrated modem must be selected to support the communication facility attaching to that port. A two lobe loop port requires three special features (#1602, #4830 and #4835). Direct connect at 4800 and 9600 bps requires the Multi-speed Clock feature (#5200). Each port of the 8140 also requires the selection of a specify code to indicate the System 8100 FAC code selected for that port. Certain System 8100 facilities will require a second specify code to select options available within that facility: 2/4 wire, line speed or multipoint control/tributary.

NOTE: The selected option specified within a given FAC and specific port position can be changed in the field by Field Engineering. All such changes are chargeable at the applicable FE hourly rate.

Specify Codes and FAC Code Descriptions:

A specify code number is required to identify the selected FAC code and its physical port position. The specify code is constructed by concatenating the selected FAC and its port position to the numeral 9, e.g.:

#9ABC where AB = FAC No. and C = Port Position

FAC codes range in number from 08 to 61 resulting in FAC specify codes ranging in number from #9081 to #9613. Additional codes may be specified for selected options. These codes are outlined in the FAC code descriptions. No two FAC codes can occupy the same port position. Configuration Manual GA27-2876 will aid in assigning the port positions.

- - - LOOP - - -			
FAC No.	FAC Code Description		
SDLC	FAC 8	Loop, high speed single lobe at 38,400 bps	
	FAC 9	Loop, high speed two lobe at 38,400 bps	
	FAC 10	Loop, single lobe at 9600 bps	
	FAC 11	Loop, two lobes at 9600 bps	

FAC 8 - Loop, High Speed, Single Lobe -- Required for operating a loop at 38,400 bps. **Limitations:** Not available with FAC 09 Loop, High Speed, Two Lobe (#9091 thru 9092) and FAC 21 and 29. Port position three not available with 8140 mdls A41 thru A44. **Prerequisites:** #1602 and #4830. **Maximum:** One per 8140. Maximum one per 8100 System. **Specify:** From the table below, specify the required code to complete the configuration for the port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9081	#9082	#9083

FAC 9 - Loop, High Speed, Two Lobe -- Required for operating a two lobe loop at 38,400 bps. **Limitations:** Not available with FAC 08 Loop, High Speed, Single Lobe (#9081 thru #9083) and FAC 21 and 29. **Prerequisites:** #1602, #4830 and #4835. **Maximum:** One per 8140. Maximum one per 8100 System. **Specify:** From the table below, specify the required code to complete the configuration for the port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9091	#9092	N/A

FAC 10 - Loop, Single Lobe -- Required for operating a loop at 9600 bps. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1602 and #4830. **Specify:**

8140 Processor (cont'd)

From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9101	#9102	#9103

FAC 11 - Loop, Two Lobe -- Required for operating two lobe loops at 9600 bps. **Prerequisites:** #1602, #4830 and #4835. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9111	#9112	N/A

--- SDLC ---

FAC No.	FAC Code	Description
EIA RS-232-C		
FAC 12	600 or 1200 bps	(external modem)
FAC 13	Up to 9600 bps	(external modem)
FAC 15	600, 1200 or 2400 bps	direct connect with clock (no modem)
FAC 16	4800 or 9600 bps	direct connect with clock (no modem)
FAC 17		Direct connect without clock
Integrated Modem		
FAC 18	600 or 1200 bps	non-switched
FAC 19	600 or 1200 bps	switched with auto answer
AT&T Dataphone Digital Service		
FAC 20	2400, 4800 or 9600 bps	non-switched
FAC 21	56,000 bps	non-switched
CCITT V.35		
FAC 24	Direct connect with clock (no modem)	600, 1200 or 2400 bps
FAC 25	Direct connect with clock (no modem)	4800 or 9600 bps
FAC 27	Direct connect without clock (no modem)	9600 bps
FAC 29	56,000 bps	non-switched

FAC 12 - EIA RS-232-C Interface -- 600 or 1200 bps with business machine clock ... operating with external modem without clocking ... and point-to-point switched 2 wire ... or point-to-point non-switched 2 or 4 wire ... or multipoint 4 wire. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1601 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9121	#9122	#9123
600 bps	9741	9742	9743
1200 bps	9751	9752	9753

FAC 13 - EIA RS-232-C Interface -- Up to 9600 bps without business machine clock ... with external data communication equipment and clock ... point-to-point switched with auto answer to 4800 bps ... or point-to-point non-switched 2 or 4 wire ... or multipoint 4 wire. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1602 and #3701. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9131	#9132	#9133

FAC 15 - EIA RS-232-C Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal or 8100 System must not provide business machine clock) and direct connection up to 40 feet. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1601 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9151	#9152	#9153
600 bps	9741	9742	9743
1200 bps	9751	9752	9753
2400 bps	9761	9762	9763

FAC 16 - EIA RS-232-C Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem (attached downstream terminal must not provide business machine clock) ... and direct connection up to 40 feet. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1602, #3701 and #5200. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9161	#9162	#9163
4800 bps	9771	9772	9773
9600 bps	9781	9782	9783

FAC 17 - EIA RS-232-C Interface -- Up to 9600 bps without business machine clock ... operating with other 8100 System (with business machine clock) ... and direct connection up to 40 feet. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1602 and #3701. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9171	#9172	#9173

FAC 18 - Integrated Modem -- 600 or 1200 bps ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1601 and #5500. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9181	#9182	#9183
2-wire			
600 bps	9851	9852	9853
1200 bps	9861	9862	9863
4-wire			
600 bps	9741	9742	9743
1200 bps	9751	9752	9753

FAC 19 - Integrated Modem -- 600 or 1200 bps ... point-to-point switched with auto answer 2 wire. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1601 and #5501. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9191	#9192	#9193
600 bps	9741	9742	9743
1200 bps	9751	9752	9753

FAC 20 - Digital Network Interface (to AT&T Dataphone Digital Service) -- 2400, 4800, 9600 bps without business machine clock ... and 4 wire point-to-point non-switched ... or multipoint non-switched. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1602 and #5660. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9201	#9202	#9203
Point-to-point or Multipoint Control			
2400 bps	9001	9002	9003
4800 bps	9021	9022	9023
9600 bps	9041	9042	9043
Multipoint Tributary			
2400 bps	9011	9012	9013
4800 bps	9031	9032	9033
9600 bps	9051	9052	9053

FAC 21 - Digital Network Interface (to AT&T Dataphone Digital Service) -- 56,000 bps without business machine clock ... and point-to-point non-switched operation. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1602 and #5660. **Maximum:** One per 8140. Maximum is one per 8100 System (not available with FAC codes 8, 9 and 29). **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9211	#9212	#9213

FAC 24 - CCITT V.35 Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem ... and direct connection up to 1000 feet. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1601 and



8140 Processor (cont'd)

#1550. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9241	#9242	#9243
600 bps	9741	9742	9743
1200 bps	9751	9752	9753
2400 bps	9761	9762	9763

FAC 25 - CCITT V.35 Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem ... and direct connection up to 1000 feet. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1602, #1550 and #5200. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9251	#9252	#9253
4800 bps	9771	9772	9773
9600 bps	9781	9782	9783

FAC 27 - CCITT V.35 Interface -- Up to 9600 bps without business machine clock ... operating with other 8100 System (with business machine clock) ... and direct connection up to 1000 feet. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1602 and #1550. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9271	#9272	#9273

FAC 29 - CCITT V.35 Interface - 56,000 bps without business machine clock and external data communication equipment with clock, and point-to-point non-switched. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1602 and #1550. **Maximum:** One per 8140. **Maximum** is one per 8100 System (not available with FAC codes 8, 9 and 21). **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9291	#9292	#9293

- - - BSC - - -

FAC No.	FAC Code Description
EIA RS-232-C	
FAC 40	600 or 1200 bps (external modem)
FAC 41	Up to 9600 bps (external modem)
FAC 43	600, 1200 or 2400 bps direct connect with clock (no modem)
FAC 44	4800 or 9600 bps direct connect with clock (no modem)
Integrated Modem	
FAC 45	600 or 1200 bps non-switched
AT&T Dataphone Digital Service	
FAC 47	2400, 4800 or 9600 bps non-switched

FAC 40 - EIA RS-232-C Interface -- 600 or 1200 bps with business machine clock ... operating with external modem with no clock ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9401	#9402	#9403
600 bps	9741	9742	9743
1200 bps	9751	9752	9753

FAC 41 - EIA RS-232-C Interface -- Up to 9600 bps without business machine clock ... operating with external data communication equipment ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1604 and #3701. **Specify:** From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9411	#9412	#9413

FAC 43 - EIA RS-232-C Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal must not provide business machine clock) and direct connection up to 40 feet. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9431	#9432	#9433
600 bps	9741	9742	9743
1200 bps	9751	9752	9753
2400 bps	9761	9762	9763

FAC 44 - EIA RS-232-C Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem (attached downstream terminal must not provide business machine clock) ... and direct connection up to 40 feet. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1604, #3701 and #5200. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9441	#9442	#9443
4800 bps	9771	9772	9773
9600 bps	9781	9782	9783

FAC 45 - Integrated Modem -- 600 or 1200 bps ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1603 and #5500. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9451	#9452	#9453
2-wire			
600 bps	9851	9852	9853
1200 bps	9861	9862	9863
4-wire			
600 bps	9741	9742	9743
1200 bps	9751	9752	9753

FAC 47 - Digital Network Interface (to AT&T Dataphone Digital Service) -- 2400, 4800 or 9600 bps without business machine clock ... 4 wire point-to-point non-switched ... or multipoint non-switched. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1604 and #5660. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9471	#9472	#9473
Point-to-point or Multipoint Control			
2400 bps	9001	9002	9003
4800 bps	9021	9022	9023
9600 bps	9041	9042	9043
Multipoint Tributary			
2400 bps	9011	9012	9013
4800 bps	9031	9032	9033
9600 bps	9051	9052	9053

- - - START/STOP - - -

FAC NO.	FAC Code Description
EIA RS-232-C	
FAC 60	110, 134.5, 150, 300 or 600 bps (external modem)
FAC 61	110, 134.5, 150, 300 or 600 bps direct connect with clock (no modem)

FAC 60 - EIA RS-232-C Interface -- 134.5, 300, 600 bps with business machine clock ... operating with external modem ... and point-to-point non-switched facilities. See M 2700 pages for specific information on communication facilities and other attachment information.

Also 110 or 150 bps with business machine clock ... operating with external modem ... and point-to-point non-switched facilities will be provided under provisions of the IBM Multiple Supplier System Policy. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
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8140 Processor (cont'd)			
Port	#9601	#9602	#9603
110 bps	9701	9702	9703
134.5 bps	9711	9712	9713
150 bps	9721	9722	9723
300 bps	9731	9732	9733
600 bps	9741	9742	9743

FAC 61 - EIA RS-232-C Interface -- 110, 134.5, 150, 300, 600 bps with business machine clock ... operating with no modem (the attached terminal must provide its own business machine clock ... and direct connection up to 40 feet. **Limitation:** Port position three not available with 8140 mdl A41 thru A44. **Prerequisites:** #1603 and #3701. **Specify:** From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection	Port 1	Port 2	Port 3
Port	#9611	#9612	#9613
110 bps	9701	9702	9703
134.5 bps	9711	9712	9713
150 bps	9721	9722	9723
300 bps	9731	9732	9733
600 bps	9741	9742	9743

HOST AND TERMINAL MODEM FACILITIES

For communication facilities and modem attachment data, see the M 2700 pages and appropriate machines pages for additional information.

1200 bps integrated modem, switched and non-switched
Dataphone Digital Service Adapter
3863 Modem, switched and non-switched
3864 Modem, switched and non-switched
3865 Modem, non-switched
3872 modem, switched and non-switched
3874 modem, switched and non-switched
3875 modem, non-switched

DIRECT CONNECTION ATTACHMENT

In addition to terminal attachment to the 8100 System through common carrier facilities (see M 2700 pages) or local loops, attachment can be made by direct connect. The direct connect is made by using the SDLC (FAC 15 or 16), BSC (FAC 43 or 44) and Start/Stop (FAC 61) facilities. Shown below are the direct connect attachable devices and required device feature numbers. The IBM 8100 Information System Installation Manual - Physical Planning, GA27-2877, will assist in the selection of direct connect cables.

FAC Code	Attach Device	Speeds (bps)	Device Feature No.
15	3276	600, 1200, 2400	#3701, w/#9491 and #8302
16	3276	4800, 9600	#3701, w/#9491 and #8302
15	3767	600, 1200, 2400	#3718 w/#9707, #9533
61	2741	134.5	#9115 or #9120
15, 24	8130/8140/8101	600, 1200, 2400	#3701 (FAC 17) or #1550 (FAC 27) and #1602
	8775-11, 12	600, 1200, 2400	#3701 (FAC 15) or #1550 (FAC 24)
16, 25	8130/8140	4800, 9600	#3701 (FAC 17) or #1550 (FAC 27) and #1602
	8775-11, 12	4800, 9600	#3701 (FAC 16) or #1550 (FAC 25)
43	2780/3780 Line Protocol	600, 1200, 2400	Refer to specific device See Note 3
44	2780/3780 Line Protocol	4800, 9600	Refer to specific device See Note 3

NOTE 3: For attachment of devices that conform to 2780/3780 protocol.

**IBM 8775 DISPLAY TERMINAL**

Purpose: A high function cathode ray tube display terminal which provides a means of entering data to or receiving data from the 8100 Information System. APL, Extended highlighting, multiple partitions, and extended data entry capabilities are available. A keyboard or a Selector Light Pen permit an operator to display and manipulate data on the screen in a flexible and efficient manner. Other functions include Audible Alarm, Security Keylock and Magnetic Slot Reader. The 8775 meets both general and unique display requirements with its set of basic and optional features.

MODELS - Loop Attach

- Model 1** Displays 960, 1920 or 2560 characters in the 9x16 character matrix size
- Model 2** Displays 960, 1920, or 2560 characters in the 9x16 character matrix size or 3440 characters in the 9x12 character matrix size

MODELS - SNA/SDLC Data Link Attach over Communication Facilities

- Model 11** Displays 960, 1920 or 2560 characters in the 9x16 character matrix size.
- Model 12** Displays 960, 1920, 2560 characters in the 9x16 character matrix size or 3440 characters in the 9x12 character matrix size.

The 8775 Display Terminal communicates with an 8130 or 8140 processor using Synchronous Data Link Control (SDLC) over either direct or data link attach loops or via data link attach over communication facilities. The basic 8775 offers equivalent function and is upward data stream compatible with the 3276/3278.

Highlights: Displays 960, 1920 or 2560 characters in a 9x16 character matrix, or 3440 characters in a 9x12 character matrix (models 2 and 12 only).

The number of characters displayed is determined under operator control. All configurations include 62 alphanumeric and 32 special characters, the Space, and Null characters. Use of 3270 Field Formatting capability permits individual fields of data on the screen to be program defined with various attributes such as protected/unprotected, alphanumeric/numeric, normal/highlighted intensity, displayable/non-displayable, and selector light pen detection allowed/disallowed.

Enhanced function, which includes APL, extended highlighting, multiple partitions and field validation, is offered as a new feature.

Operator Factors: The 8775 has an anti-reflective screen. Indicators are displayed on the bottom row of the screen, outside the data display area, and provide useful operator information. Updating the screen from the host is accomplished without refresh interrupt (i.e., no blinking). The keyboard, which is low in profile, provides a palm rest area and has separators to help prevent accidental striking of control keys. The operator may select one of several cursor modes.

Editing Facilities: Cursor move, tab, home key, back tab, insert, delete, extended erase (erase to end-of-field, erase all keyboard input data, and erase entire screen) and cursor select keys are all basic. All alphanumeric, special symbol, and cursor move keys have typematic capability. Double speed cursor typematic is attained with a simultaneous depressing of the ALT key and a horizontal cursor positioning key. The cursor select function provides an alternative to the selector light pen function. Fields of data may be selected by positioning the cursor then using the cursor select key.

Input Flexibility: A choice of keyboards or the the selector light pen provide input flexibility ... see "Special Features" below. Fields of data can be selected by positioning the cursor and operating the cursor select key, instead of using the selector light pen. Twelve Program Function (PF) keys are basic with all typewriter keyboards; seven or more PF keys are available on all Data Entry Keyboards.

Security Facilities: A special non-displayed input mode provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock (optional) prevents modification or display of data in the display buffer unless the key is turned to the "on" position. The Set Up Keylock (optional) controls access via the keyboard to change the terminal address. Those capabilities and the terminal's ability to identify itself to the host program, allow customer-supplied security program routines to control access to data and to record an audit of actions. A Magnetic Slot Reader is available to enter system user identification.

Communications: 8775 display terminals are attached to customer-owned loops or data link attached, to an 8100 Information System. A direct loop to an 8100 System processor may operate at 34.8K bps, or 9600 bps, this operating speed being determined by the customer at order time. A data link attached loop operating

at 2400 bps (1200 bps half-speed option) may be connected to the 8100 System via the 3842 Loop Control Unit and the 3872 Modem. The 3842 can be connected multipoint or point-to-point on a leased transmission facility to a 3872 modem at the 8100 System site of operation.

The 8775 may communicate to an 8100 Information System using Synchronous Data Link Control (SDLC) transmission over data link non-switched communication facilities.

Communication Facilities: The 8775 operates in data half duplex mode over non-switched facilities in 2 or 4 wire point to point or 4 wire multipoint configurations at transmission speeds of 1200/600, 2000, 2400/1200, 4800/2400, 7200/3600, and 9600 bps on non-switched facilities D3, D3M, D4, D4M, D5, D5M, D6, D6M, D7M, X1, X1M, X2, X2M, X3, X3M. Refer to M 2700 pages.

Modems: A 1200 bps integrated modem feature (#5500) or an external IBM modem may be attached to an 8775. External modems require the External Modem Interface (#3701).

MODEMS

3872 mdl 1 -- 2400/1200
3874 mdl 1 -- 4800/2400
3875 mdl 1 -- 7200/3600

For communication capabilities, product utilization and special features see the M 2700 pages and appropriate modem pages for additional information.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of the problem determination and recovery routines and procedures that are easily understood and used by the operator. See "Customer Responsibility" below.

Customer Set-up (CSU): The 8775 is designated Customer Set-up, thereby offering customers ease of set up and relocation flexibility.

One copy of the CSU instructions, Problem Determination Guide, and Trouble Report form are shipped with each 8775.

Customer Responsibility The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at customer's receiving dock, unpacking and placement of 8775 display terminal.
- Physical set up, connection of cables incorporating protected customer access areas, and checkout.
- Contact Field Engineering to make cable connections of IBM CSU units to non-CSU units where customer access area is not provided.
- Notify IBM of intent to relocate and follow IBM instructions for relocation.
- Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.
- Disconnecting, packing and removal to the customer's shipping dock at time of discontinuance; appropriate instructions will be provided by IBM.

Bibliography: Refer to *An Introduction to the IBM 8775 Display Terminal*, GC33-3040.

Specify: [1] Voltage (120V AC, 1-phase, 3-wire, 60Hz): #9890 for locking plug, or #9891 for non-lock plug. If standard 2.8 meter (9 foot) power cable is not desired, specify #9511 for 1.8 meter (6 foot) cable, #9512 for 3.7 meter (12 foot) cable, or #9513 for 4.5 meter (15 foot) cable.

[2] Attachment: Specify the following:

- #9221 - for attachment to the 8130 Processor
- #9222 - for attachment to the 8140 Processor.

[3] Distribution of Magnetic Media for Enhanced Function Feature (#3624) or Multiple Partitions and Scrolling (#5110). Specify:

- #9491 - for one 8775 on each 8100 system.
- #9492 - for all other 8775s on each 8100 system.

Note: For each 8100 System with one or more 8775 (with #3624 or #5110) attached, one and only one 8775 should specify #9491. Care should be exercised when relocating 8775s that this relationship is maintained.

If #9491 is specified also select #9425 Diskette 2D to identify the type of magnetic media. Additional shipping instructions are also required.



8775 Display Terminal (cont'd)

Whenever the Enhanced Function Feature (#3624) or Multiple Partitions and Scrolling (#5110) is updated by an EC the magnetic media will be sent to the address associated with the TPC for each display terminal designated by specify #9491.

All 8775s with #3624 or #5110 are attached to a system which is assigned a TPC (Teleprocessing Control Number). This TPC identifies a network associated with an 8100 System or a central site facility. The TPC,

is a six character code. TPC is assigned subsequent to delivery of the 8775 when the machine serial number is known.

[4] Communication Cable: A 1.8 meter (6 foot) communication cable is provided for attachment to a direct or data link attached loop. If the 1.8 meter cable is not desired, specify #9405 for a 4.3 meter (14 foot) cable.

A 6.1 meter (20 foot) communication cable is provided as standard for attachment to standalone modems or to the communication facility when an integrated modem is used or to the communication facility when a DDS adapter is used. If the standard communication cable is not desired, specify #9061 for 3.0 meter (10 foot) cable, #9062 for 9.1 meter (30 foot) cable or #9063 for 12.2 meter (40 foot) cable. With the CCITT V35 Interface (#1550) feature, a 3.0 meter (10 foot) cable is supplied.

[5] Character Set: #9082 for EBCDIC Character Set -- used in conjunction with 75-key Typewriter Keyboard or Data Entry Keyboard or 87-key EBCDIC Typewriter Keyboard.

PRICES:	Mdl	MRC	MLC 2 yr	Purchase	MMMC/ AMMCR
8775	1	\$ 74	\$ 63	\$2,835	\$ 19
	2	83	71	3,195	19
	11	80	68	2,935	23
	12	89	76	3,295	23

Rental Plan: Plan D Warranty: B Machine Group: D
Useful Life Category: 2 Purchase Option: 55% Per Call: 1
Initial Period of Maintenance Service: 3 mos.
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Yes, as shown below. Field installation: Yes.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model 1 to Model 2 \$650
From Model 11 to Model 12 \$650

SPECIAL FEATURES

SET UP KEYLOCK (#1009). Controls access to change the unit address of the terminal. Maximum: One. Field installation: Yes.

AUDIBLE ALARM (#1090). An alarm sounded under program control to alert the operator to a special condition. This alarm, during keyboard operation, is also sounded when a character is entered into the next-to-last position on the screen. The operator may adjust the volume of the tone. Maximum: One. Field installation: Yes.

BUSINESS MACHINE CLOCKING (#1488). Required for attachment of IBM 1200 bps Integrated Modem feature (#5500) or any external modem that does not provide its own clocking and operates at 1200/600 bps. Maximum: One. Field Installation: Yes.

FEATURE STORAGE (#3622). Provides the storage capacity required for enhanced function or Multiple Partitions and Scrolling (#5110). Maximum: One. Field installation: Yes. Note: The Enhanced Function Feature and Multiple Partitions and Scrolling consist of two sets of data contained on magnetic media. Either set but not both can be loaded into the 8775 via the 8100 system at a given time. Refer to "Specify" for information on the shipment of the magnetic media to the proper location.

ENHANCED FUNCTION FEATURE (#3624). Provides the ability to display APL characters, to highlight data, display data in user-defined partitions and to validate data fields as they are entered into the display terminal from the operator keyboard. Highlight is on a per character basis in one of three user selectable modes, blink, reverse video or underscore, and, additionally, on a field basis for intensity. Partitioning provides the ability to display data in up to eight user defined rectangular partitions and for the host or user to interact individually with the data within each partition. APL provides the ability to display the space (blank) and the unique characters consisting of 94 EBCDIC, 81 APL specific, 37 characters unique to 3270 text and 10 new graphic characters.

Validation provides:

Mandatory Enter - Data must be entered into this field to permit entry to the host.

Mandatory Fill - All positions in this field must be filled to permit entry to the host.

Trigger Field - Causes the contents of the field to be sent from the display when data has been entered into the field and the cursor leaves the field.

Maximum: One. Field installation: Yes. Prerequisites: Feature Storage (#3622), Feature Adapter (#3905). If APL is used, 87-key APL Typewriter Keyboard (#4626) is required. If keyboard selectable highlighting is desired, 87-key keyboards (#4626 or #4627) are required.

FEATURE ADAPTER (#3905). Provides the logic and control necessary to perform the enhanced function. Maximum: One. Field installation: Yes. Prerequisites: Feature Storage (#3622) or Enhanced Function (#3624).

KEYBOARDS

#4621 -- 75-key Typewriter Keyboard, typewriter-like layout, movable, with 49 data keys and 26 control keys. Twelve program function keys are included in the top row of data keys through use of an alternate shift key. Prerequisite: EBCDIC Character Set (#9082).

#4622 -- 75-key Data Entry Keyboard, movable with 35 data keys, 10 program function keys and 30 control keys. Prerequisite: EBCDIC Character Set (#9082).

#4623 -- 75-key Data Entry Keyboard, keypunch layout, movable, with 35 data keys, 10 program function keys and 30 control keys. This is the recommended keyboard for high volume data entry. Prerequisite: EBCDIC Character Set (#9082).

#4626 -- 87-key EBCDIC Typewriter/APL Keyboard, an 87-key EBCDIC typewriter keyboard (ref #4627) with modified keytops to allow entry of 81 APL specific characters in addition to the 94-character EBCDIC set. An APL On/Off key controls whether the keyboard is in basic EBCDIC typewriter or APL mode. In contrast to the 87-key EBCDIC typewriter keyboard without APL (ref. #4627), this keyboard has only twelve program function keys (PF1 thru PF12) which are the group of twelve keys to the right of the main keyboard area. Prerequisites: Enhanced Function Feature (#3624), EBCDIC Character Set (#9082).

#4627 -- 87-key EBCDIC Typewriter Keyboard, typewriter-like layout, movable, with 49 alphanumeric data keys, 26 control keys and 12 program function keys (24 total PF keys). Twelve of the program function keys are included in the top row of the data keys through the use of an alternate shift key. Prerequisite: EBCDIC Character Set (#9082).

Maximum: One of the above keyboards. Field installation: Yes. The keyboard is set up by the customer. Specify: If 0.9 meter (3 foot) keyboard cable is not desired, specify #9399 for 1.8 meter (6 foot) cable. Limitation: Keyboards used on 3275/3276/3277/3278 machines are not interchangeable with keyboards used on 8775 machines.

KEYBOARD NUMERIC LOCK (#4690). Provides the ability to lock the keyboard if a non-numeric key (other than 0-9, minus (-), decimal sign, or dup) is depressed in a pre-defined numeric-only field. Maximum: One. Field installation: Yes.

ATTACHMENT FEATURE [Mdl 1 or 2] Each 8775 must be equipped with a loop adapter which provides the capability to attach to a direct or data link attached loop of the 8100 System.

LOOP ADAPTER (#4850). Provides the capability to attach to a direct or data link attached loop of an 8100 System. Direct loop may operate at a data rate of 38.4K bps or 9600 bps. The data link attached loop operates at a data rate of 2400 bps with a half-speed option of 1200 bps. Operating speed of 38.4KB, 9.6KB, or 2.4KB is determined by the customer at order time, half-speed of 1200 bps can be selected by the operator. Data link attached loops are connected via 3842 Loop Control Unit.

Specify: On initial order or by change by service representative. #9822 for 2400 bps ... #9825 for 9600 bps ... #9829 for 38.4K bps. The data rate of a loop cannot be higher than that of the slowest device attached to the loop. Consideration should be given to attaching devices slower than the 8775 on a separate loop when the maximum data rate of the 8775 is required. Maximum: One.

MONOCASE SWITCH (#4944). Provides the choice to display either uppercase characters only or both uppercase and lowercase characters. Maximum: One. Field installation: Yes.

MAGNETIC READER CONTROL (#4999). Provides the capability of attaching a Magnetic Slot Reader which reads encoded information (numeric only) from a magnetic stripe. Maximum: One. Field installation: Yes.

**8775 Display Terminal (cont'd)**

MULTIPLE PARTITIONS AND SCROLLING (#5110). Multiple partitions provide the ability to display data in up to eight user defined rectangular partitions and for the host or user to interact individually with data within each partition. Scrolling provides the ability with any designated partition for user interaction with a data record longer than provided for by the physical size of the visible portion of that partition. The operator controls the movement of data either up or down through the use of Scrolling control keys located on the keyboard. An additional scrolling buffer of a maximum of 58 lines of 80 characters to a line (4640 characters) is provided. The actual scrolling capability is dependent upon screen/partition configuration. **Maximum: One. Field Installation: Yes. Prerequisite: Feature Storage (#3622).**

SECURITY KEYLOCK (#6340). A lock and key which prevents modification or display of data in the display terminal when in the "Off" position. **Maximum: One. Field Installation: Yes.**

SELECTOR LIGHT PEN (#6350). A hand-held, pen-like device which permits the operator to select fields of data from a display for input into the host system. The Selector Light Pen, while not being used, can be placed in a recess of the keyboard which is used for user's incidental items. Selector Pen (and Cursor Select) operations include a new designator character "&". When this designator is used, the Read Modified operation results in the return of both the addresses and the data of all modified fields on the screen. **Maximum: One. Field Installation: Yes.**

Telecommunication Features

Each 8775 mdl 11 or 12 must be equipped with one of the following communication features; CCITT V35 Interface (#1550), External Modem Interface (#3701), 1200 bps Integrated Modem (#5500), DDS Adapter (#5650 or #5651).

CCITT V35 INTERFACE (#1550). Provides a CCITT V35 interface for direct connection up to 1000 feet operating without a modem. Speeds of 600, 1200, 2400, 4800 and 9600 bps are supported. Business Machine Clocking (#1488) is not required. **Maximum: One. Field Installation: Yes on mdls 11 and 12. Limitation: Cannot be installed with #3701, #4850, #5500, #5650 or #5651.**

EXTERNAL MODEM INTERFACE (#3701). Provides an EIA RS-232C interface and appropriate code to attach either an external IBM modem or PTT mandatory modem. Refer to M 2700 pages. Other external non-IBM modems may be attached subject to the multiple system supplier bulletin. Provides interface to Data Service Unit for attachment at AT & T Dataphone Digital Service. Supports speeds of 600, 1200, 2000, 2400, 4800, 7200 and 9600 bps. Also supports direct connection up to a distance of 40 feet at speeds of 600, 1200, 2400, 4800, 9600 bps. Business Machine Clocking (#1488) is not required. **Maximum: One. Field Installation: Yes on mdls 11 and 12. Prerequisite: Business Machine Clocking (#1488) required for those modems which do not provide their own clocking. Limitation: Cannot be installed with: #1550, #4850, #5500, #5650 or #5651.**

IBM 1200 BPS INTEGRATED MODEM NON-SWITCHED (#5500). Provides an integrated modem at speeds of 1200/600 bps for operation over non-switched communication facilities. No external modem is required. Specify: #9651 for use with four wire facility or #9652 for use with two wire facility. **Maximum: One. Field Installation: Yes on mdls 11 and 12. Limitation: Cannot be installed with #1550, #3701, #4850, #5650 or #5651. Prerequisite: Business Machine Clocking (#1488).**

DDS ADAPTER (#5650 for point to point operation; #5651 for multi-point tributary operation). An adapter for SDLC data transmission at speeds of 2400, 4800 or 9600 bps over the AT & T non-switched Dataphone* Digital Service Network. The DDS Adapter interfaces to a DDS channel service unit, the customer site termination of the DDS network. Specify: #9822 for 2400 bps ... #9823 for 4800 bps ... #9825 for 9600 bps. **Maximum: One #5650 or #5651. Field Installation: Yes on mdls 11 and 12. Limitations: Cannot be installed with #1550, #3701, #4850, #5500.**

Special Feature Prices:	MLC		Purchase	MMMC/ AMMCR
	MRC	2 yr		
Set Up Keylock	#1009	\$ 60SUC -	\$ 60	N/C
Audible Alarm	1090	2 2	90	N/C
Business Machine Clock	1488	6 5	225	1.00
CCITT V35 Interface	1550	15 13	510	2.00
Feature Storage	3622	19 16	720	\$ 3.00
Enhanced Function	3624	N/C N/C	N/C	N/C
External Modem Interface	3701	12 10	400	4.00
Feature Adapter	3905	11 9	405	1.50
Keyboard -				
75-key Typewriter	4621	13 11	495	2.50
75-key Data Entry	4622	13 11	495	3.50
75-key Data Entry (Keypunch Layout)	4623	13 11	495	3.50
87-key Typewriter/APL	4626	18 15	675	3.00
87-key Typewriter	4627	18 15	675	3.00
Keyboard Numeric Lock	4690	N/C N/C	N/C	N/C
Loop Adapter	4850	8 7	315	1.50
Monocase Switch	4944	N/C N/C	N/C	N/C
Mag Reader Control	4999	11 9	405	2.00
Multi Partitions & Scroll	5110	N/C N/C	N/C	N/C
1200 bps Int Modem				
Non-switched	5500	19 16	668	5.00
DDSA - Pt to Pt	5650	24 20	840	2.00
DDSA - Multipt Tributary	5651	24 20	840	2.00
Security Keylock	6340	35SUC -	35	N/C
Selector Light Pen	6350	15 13	585	.50

ACCESSORIES

The following are available on a purchase only basis. Order the Part No. indicated below at the price listed in the M10000 pages. See M10000 for additional information and field installation.

MAGNETIC SLOT READER (Part No. 4123500) -- a free-standing Magnetic Slot Reader (MSR) that reads encoded information from a magnetic stripe. It attaches by a 1.5 meter cable through the Magnetic Reader Control (#4999). The MSR has 3 lights and a buzzer which provide feedback to the user on the status of the read data. The MSR accommodates a wide range (height and length) of magnetic striped plastic cards such as: ID badges, security operator identification cards, etc. These cards can be encoded with numeric only up to 40 characters at 75 bits per inch, or up to 65 characters at 127 bits per inch.

Note: Magnetic cards coded with the Alternate End of Message character (hexidecimal "C") cannot be read by this reader. The MSR cannot be used to log on to an SNA network. **Maximum: One. Limitation: Valid for numeric only. Prerequisite: Magnetic Reader Control (#4999).**

MERCURY BATTERY (Part No. 1743456) -- provides power to maintain critical information while the terminal is powered off. This supply item is a 4.14 volt non-rechargeable mercury battery. This battery has a shelf life of 1 year under normal conditions and can be expected to provide 3.5 years of normal operation. One battery is supplied at no additional charge with the initial order. Discharged batteries should be returned to IBM for disposal. **Field Installation: Yes, by customer.**

* Trademark of American Telephone & Telegraph.



IBM 8809 MAGNETIC TAPE UNIT

Purpose: Magnetic tape unit for the 4331 Processor and the 8100 Information System. Provides high speed save/restore capability for fixed DASD as well as satisfying the DB/DC journaling, tape interchange and processing of the using system.

- Model 1A** First drive which attaches to the 8101 Storage and I/O Unit or to the 8809 Magnetic Tape Unit Adapter on the 4331 Processor.
- Model 1B** First drive which attaches to the 8130 or 8140 Processor.
- Model 2** Second or fourth drive which attaches to the first (Model 1A or 1B), third drive (Model 3), or fifth drive (Model 3), respectively.
- Model 3** Third drive or fifth drive which attaches to a Model 2.

Model Changes: Available at time of manufacture only.

HIGHLIGHTS

The 8809 Magnetic Tape Unit transports tape directly from reel to reel without capstans or vacuum columns, with tape tension and velocity controlled electronically.

The 8809 will operate in one of two operating modes selectable by the host processor. The first mode is start/stop mode, in which the 8809 runs at .3175 meters per second (12.5 inches per second) to achieve a 20,000 bytes per second instantaneous data rate. The second mode is streaming mode in which the 8809 runs at 2.54 meters per second (100 inches per second) to achieve a 160,000 bytes per second instantaneous data rate for volume dumps.

Tapes written in either start/stop or streaming mode have an identical tape format. This 63 bytes per millimeter (1600 bytes per inch) phase encoded tape format permits the compatible interchange of tapes with IBM 2400 and IBM 3400 tape subsystems operating with the same recording format and density.

Note: The 8100 Information System will require dedicated operation to achieve streaming mode for save/restore volume dumps. The 4331 Processor may require dedicated operation and/or selection of the long gap (30.5mm or 1.2") mode in order to achieve acceptable performance in streaming mode.

Checking: Each byte is parity checked while tape is being read. Data written on tape is read back and checked as in reading, with full parity check.

Error Correction: Single track error correction "in flight" takes place similar to other IBM tape products in 63bpm (1600bpi) Phase Encoded Mode during read operations.

Characteristics

	Start/Stop	Streaming*
Tape Speed (± 5%)	.3175 m/s (12.5 ips)	2.54 m/s (100 ips)
Data Rate, Instantaneous	20kb/s	160kb/s
Access Time (Write)	40ms	295ms
Access Time (Read)	44ms	295ms
IBG Time, Nominal 0.6 inch gap (1.524 cm)	48ms	6ms
IBG Time, Nominal 1.2 inch gap (3.048 cm)	96ms	12ms
Rewind Time (2400 ft reel) (732 meters)	2.6 min	2.6 min

* Refer to *IBM 8809 Magnetic Tape Introduction*, GA26-1659, for additional details.

Maximums:

8100 Information System -- up to four 8809 units can be attached to an IBM 8100 Information System: Model 1A or 1B followed by a model 2, model 3 and another model 2.

4331 Processor -- up to six 8809 units can be attached to a 4331 Processor: Model 1A followed by a model 2, model 3, model 2, model 3, and another model 2.

Prerequisites: [For Model 1A]

8100 Information System

A. Magnetic Tape Attachment (#4521) on the 8101 Storage and I/O Unit.

B. Diskette Drive and Magnetic Tape Attachment (#1507) on the 8101 Model A10.

4331 Processor

8809 Magnetic Tape Unit Adapter (#4910).

Magnetic Tape: The media required for the 8809 must meet the

specifications as stated in *Tape Specifications for One-half Inch Tape Units*, GA32-0006-5. IBM Multi-System Tape (MST) is recommended for use on the 8809 in the Extended Environment.

Assuming media requirements are met, the 8809 accommodates most industry standard reel sizes of 15.9 centimeters (6.25 inches), 17.8 centimeters (7.0 inches), 21.6 centimeters (8.5 inches), and 26.7 centimeters (10.5 inches).

Limitations: The reel inertia is critical to the 8809 motion control system. An example of a reel that does not meet the 8809 inertia requirement is the 26.7 cm (10.5 inch) large hub reel (P/N 1669031) that is designed to hold 366 meters (1200 feet) of tape. A detailed description of tape reel inertias is contained in the *Tape Specifications Manual*, GA32-0006-5 and *The IBM 8809 Magnetic Tape Unit Introduction*, GA26-1659.

Interchange of tape written on an 8809 at its extended environment with a current IBM tape drive at its non-extended environment may result in an inter-layer slippage, permanent, or temporary errors. A detailed description of tape environmental requirements is contained in the *Tape Specifications Manual*, GA32-0006-5.

Bibliography: *Tape Specifications for IBM One-Half Inch Tape Units at: 556, 800, 1600, and 6250 BPI*, GA32-006-5.

IBM 8809 Magnetic Tape Unit Introduction, GA26-1659,

Introduction to the IBM Information System, GA27-2875.

IBM 8100 Information System Installation Manual - Physical Planning, GA27-2877.

IBM 8100 Information System Configurator, GA27-2876.

IBM 4300 Processors Summary and Input/Output and Data Communications Equipment Configurator, GA33-1523.

Input/Output Equipment Installation Manual - Physical Planning for System/360, System/370, and 4300 Processors, GC22-7064.

SPECIFY

- **Voltage** (AC, 1-phase, 3 wire, 60HZ): #9911 for 120V, #9902 for 208V, or #9914 for 240V.
- **8100 System Attachment:** #9606.
4331 Processor Attachment: #9607.
- **Color** (4331 Processor only):
#9060 for Willow Green
#9061 for Garnet Rose
#9062 for Sunrise Yellow
#9063 for Classic Blue
#9064 for Charcoal Brown
#9065 for Pebble Grey

PRICES: Mdl	MRC	MLC 2 Yr	Purchase	MMMC/ AMMCR
8809 1A	\$341	\$290	\$10,440	\$48
1B	417	355	12,780	63
2	303	258	9,270	43
3	341	290	10,440	48

Plan Offering: Plan D Purchase Option: 55% Per Call: 1
Machine Group: D Warranty: B Useful Life Category: 2
Termination Charge Months: 5 Termination Charge Percent: 25
Initial Period of Maintenance Service: 3 mos.
Upper Limit Percent: 5%

SPECIAL FEATURES

8100 SYSTEM MULTI-DRIVE FEATURE (#4920). (8809 Model 1B only) Required on a mdl 1B if more than one tape drive (additional mdl 2 or mdl 3) is attached to an 8100 System.

Special Feature Prices:	MRC	MLC 2 YR	Purchase	MMMC/ AMMCR	
8100 System Multi-drive Feature	#4920	\$12	\$10	\$360	\$1.00



ACCESSORIES

ENDORSER PLATES

The Endorser Plate is made to the customer's specifications. An additional charge is made for an endorser plate that requires art and layout work which cannot be accomplished by straight line type setting. This additional charge applies to single plate orders and the first plate of multiple plate orders. Documents can be endorsed with date, identification number and the bank's legal endorsement.

It is recommended that the customer stock at least one spare endorser plate for each group of machines with identical plates, since plates cannot be immediately replaced.

	Feature	Purchase	FIC*
Prices: For 802 or 803 — no artwork required	#3792	\$ 48	\$ 13
For 1201 — no artwork required	3792	48	13
For 1203 or 1260, w Serial Numbering/Endorsing (#3791) — no artwork req'd	3792	53	**
For 1203 (old style plate) — no artwork required (Field Installation Only)	3794	53	**
For 1210, 1219, 1241, 1412, 1419 or 1421 — no artwork required	3792	77	13
*** Art and layout work, if required for any of the above — Additional Charge	3796	35****	**
Blank Endorser Plate (Plant Installation Only)	3793	No Charge	PO

- * FIC applies to field installation on both rental and purchase machines.
- ** Not applicable.
- *** Artwork for old style 1203 Endorser Plate cannot be used for the Serial Numbering/Endorsing Plate. If artwork is required, the charge for #3796 will apply.
- **** Service Charge.

Replacement: Mechanical and Capacity Replacement Machines: 801, 802, 803 or 1201 replaced by 803 or 1201 ... 1203 replaced by 1203 ... 1260 replaced by 1260 ... 1210, 1219, 1241, 1412, 1419 or 1421 replaced by 1419 — a replacement endorser plate will be shipped with each replacement machine at no charge when the machine being replaced has an endorser. If any change in plate design is desired, there is a charge only for art and layout work (#3796), if applicable. The endorser plate on a displaced machine is to be left with the machine, but defaced and rendered unusable.

Installed Machines: The normal plate charge will apply whenever replacement of a worn or damaged plate is required. Charges for art and layout work are to be added, if applicable. Note: Endorser plates are interchangeable only within the group of machines listed on each line under "Prices."

- Specify:** [1] For shipment with machine, order #3792 or #3793. For field installation, order #3792 ... for old style 1203 plate, order #3794. In all cases, if art and layout work is required for #3792 or #3794, also order #3796.
- [2] If #3792 is ordered on several machines, for shipment with machines, or if #3792 or #3794 is ordered for field installation, a completed Endorser Plate Specification Sheet must be forwarded for each machine. If available, a sample endorsement should be attached to each Spec Sheet.
- [3] For a mechanical or replacement machine, order Endorser Plate (#9140) at no charge. If any change in plate design is desired, the charge for art and layout work (#3796) is to be added if applicable. Attach sample endorsement to the Endorser Plate Spec Sheet and forward to the plant.
- [4] When ordering #3792, #3793 or #9140 for shipment with a machine, specify color of ink to be used — #9145 for black, #9146 for green, #9147 for purple, or #9148 for red.



ACCESSORIES

		Purchase	MMMC	FIC
	Feature	Purchase	MMMC	FIC
FORMS STAND	Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing. This accessory is a two-shelf forms stand.			
	For 2213, 3284, 3286, 3287, 3645, 3713, 3735, 3767, 3771, 3773, 3774, 3784, 3791, 3792	#4450	\$77	NC
	For 2152	4450	61	NC
	For 5213	4450	50	NC
	Permits feeding of continuous forms from the carton and provides for forms stacking after printing. This accessory is a one-shelf forms stand.			
	For 3288, 3610, 3612, 3615, 3618, 3775†††	#4450	\$54	NC
	††† On the 3775 it is recommended that forms be used out of carton.			
		Purchase	MMMC	FIC
FORMS GUIDE/ROLL PAPER HOLDER (for 3735)	Provides guide for continuous forms or for mounting rolls of paper. Includes a tear bar. Order Part No. 1858653.	\$ 65	TM	\$ 15
LONG FORMS STACKER GUIDES (for 3211)	Useful on 3211 when it is required to print on forms having a fanfold depth greater than 18". One guide supports the paper supply stack and the other extends the stacking area to accommodate the long folds. The rear stacker guide prevents automatic operation of the power stacker folding belts only when in use. Order Part No. 2471661.	265	NC	NC
ILLUMINATING LAMP (802/803)	Bulbs are not included. order #4610.	42	NC	NC
ROLL PAPER HOLDER (for 2740 or 2741)	Provides for mounting of rolls of paper or continuous forms. Includes a tear bar and forms guide. Order Part No. 1186101.	65	TM	15
STACKER FOR 1403 (For use with Selective Tape Listing Feature)	Used by 1403s equipped with Selective Tape Listing Feature (#6410, 6411) for orderly stacking of both selective listing tapes and fold pack paper. It is mounted on the back of the printer directly beneath the present stacker rolls. The pocket separators can be moved to obtain 4 to 8 pockets which will stack 3.1" or 1.5" width paper respectively. Combinations of 3.1" and 1.5" width papers can be processed on the same run. Each pocket holds approximately 1,000' of fanfold paper, or 20' of selective listing tapes. The stacker contains its own motor which drives the stacker roll shaft. When the Selective Tape Listing Feature is not in use, the stacker can be easily removed. order #6413	350.00	TM	NC

† If shipped prior to June 1, 1963 on a Single Use-Charge basis, may be retained by rental customers at any time in the future if they so desire. Where shipped on or after June 1, 1963, the items are to be removed when rental machines are discontinued.

†† If ordered on a Single Use-Charge basis prior to August 6, 1973, may be retained by rental customers at any time in the future if they so desire. Upon machine discontinuance, if a customer does not desire to retain roll paper holder, it is to be returned with the machine. If ordered on a purchase basis, the roll paper holder remains the property of the customer and is to be removed when a rental machine is discontinued.



ACCESSORIES

CABLES

- 3277 Display Sta
- 3278 Display Sta
- 3284 Printer
- 3286 Printer
- 3287 Printer
- 3288 Line Printer

Cables and or associated parts to attach the subject machines to the 3271/3272 Control Units and 3276 Control Unit Display Stations may be purchased from a customer selected source. For the proper identification, installation, and application of the subject cable and parts, see IBM 3270 Installation Manual - Physical Planning, GA27-2787. The customer is responsible for installation and maintenance of these cables and their associated parts.

		Purchase Price
Assm # 2577672	Cable Assembly Indoor	
Bulk # 0323921	Coax Wire (Note 1)	See Cable Assm. No. 2577672
Part # 1836418	Connector Kit (Note 1)	\$ 4.50
Assm # 1833108	Cable Assembly Outdoor	
Bulk # 5252750	Coax Wire (Note 2)	See Cable Assm. No. 1833108
Part # 1836419	Connector Kit (Note 2)	7.30
Part # 2621414	Modification Kit (Note 3)	5.30
Part # 1833106	Station Protector Attachment Kit (Note 5)	16.70
Part # 5252643	Adapter (Note 7)	2.65
Part # 1830818	Station Protector Kit, Gas (Note 4)	48.75
Part # 5252899	Station Protector Element, Gas (Note 6)	8.40

Order Specify Part #, Assembly # or Bulk # as appropriate.

- Note 1: Coax wire and one connector kit (includes 2 connectors no. 1836444) required for each indoor cable assembly.
- Note 2: Coax wire and one connector kit (includes 2 connectors no. 1836447) required for each outdoor cable assembly.
- Note 3: Customers replacing 2260 Display Stations may utilize the existing installed cables by use of this modification kit. One kit required for each cable.
- Note 4: Must be used with outdoor cable assembly when installed outdoors (either above or below ground level). One kit required for each cable assembly.
- Note 5: Used to attach outdoor cable to station protector. One kit required for each cable assembly.
- Note 6: Replacement station protector elements.
- Note 7: Used to join two 2577672 or two 1833108 cable assemblies together.

CABLES
(3600)

Cables to attach 3600 units may be purchased from IBM or a customer-selected source ... see Physical Planning Manual GA27-2766 for cable and connector specifications. The customer is responsible for installation and maintenance of these cables. Assembled cables may be purchased from IBM at the prices shown below. Order appropriate. Specify bulk cable number, cable assembly number or part number as appropriate.

Item No.	Description	Maximum Length	Purchase Price
ASSM 1563155	Loop Cable Assembly	609.6m(2000')	
ASSM 1741656	Cable Assy (joining 2 telephone lines)	N/A	
ASSM 1745348	Cable Assy (3603 to Loop Terminal Box)	7.62m(25')	
ASSM 1745372	Cable Assy (Loop Repeater to Loop Terminal Box)	7.62m(25')	
ASSM 1745349	Cable Assy (DDA to 3603)	7.62m(25')	
ASSM 1745350	Cable Assy (3603 to Leased Lines)	7.62m(25')	
BULK 5252769	Bulk Cable (2 Conductor)	N/A	
BULK 5252913	Bulk Cable (4 Conductor)	N/A	
PART 1561344	Strain Relief		\$.10
PART 1745363	Connector Assembly (3603)		18.00
PART 5252765	Male Plug		2.75
PART 5252766	Female Plug		4.00
PART 5420242	Mini-Ty (used with 1745363)		.05

CABLES
(3650, 3660, 3680)

Bulk loop cable to attach 3650, 3660 or 3680 units may be purchased from IBM or a customer selected source ... see Physical Planning Manual, GA27-3074, or 3680 Site Planning Guide for bulk loop specifications. The customer is responsible for installation and maintenance of these cables. The bulk cable may be purchased from IBM at the price shown below. Order appropriate. Specify bulk cable number and number of feet desired.

Bulk Cable No.	Purchase Price
5165886	Price per Foot

CABLES
(3790, 3730)

Cables to attach 3730 and 3790 units may be purchased from IBM or a customer selected source. specifications and usage. The customer is responsible for installation and maintenance of these cables. Coaxial cables, connections and accessories for the 3277 and 3288 are applicable when these parts are attached to the 3790 system. Refer to 3270 Cable Accessory section for prices and part numbers.

Unit	Cable Assm No.	Use	Maximum Length	Purchase Price Base + Per Foot	Note
3791	1832533	Keyboard-Printer	48'		1
3792	1832533	Keyboard-Printer	48'		1
	1454167	75 Cond. Cable Bulk			
	1836445(P/N)	Connector Group		\$61.85	2
3791	2577672	Aux. Control Unit	2,000'		3
3791	2577672	3760 mdl 1 and 3	2,000'		3
3791	2577672	3762 (indoor)	2,000'		3
3791	2577672	3732, 3736 (indoor)	2,000'		
3791	1833108	3732, 3736 (outdoor)	2,000'		

- Notes: 1. Communications cable consisting of bulk cable #1454167 and connector group #1836445.
- 2. Contains connector assemblies for both ends of communications cable.
- 3. Indoor cable. For coax wire and connector kits refer to 3270 Cable Accessory section for prices and part numbers.



ACCESSORIES

LOCKS AND KEYS

Purchase MMMC FIC

1062: The 1062 is equipped with three locks (Teller A, Teller B, and Auditor) and a complement of keys ... two Teller A, two Teller B, one Master Teller (to fit both Teller A and Teller B locks and, normally, other 1062 Teller locks in the same installation), and one Auditor (normally fits all Auditor locks in the installation). Additional or replacement keys may be purchased. Locks may be changed in the field. **Note:** Removed locks should be destroyed locally.

1062 Key, each \$ 2.50 NC NC
Specify: For each set of keys - Machine Serial Number ... Key (Teller A or B, Master Teller, or Auditor) ... Key Identification Number (stamped on key).

1062 Lock, field installation 11.00SUC NC NC
For rental customer, each 11.00 NC NC
For purchase customer. Price based on return of old lock to IBM, ea
Specify: For field replacement of lock - Machine Serial Number and Lock (Teller A or B, Auditor) ... indicate any compatibility requirements (such as master teller key interchangeability) with locks on other units in the system. Each replacement lock includes two keys.

3275, 3276, 3277, 3278, 3732: The 3275, 3276, 3277, 3278 or 3732 with the Security Keylock (#6340) special feature is shipped with two keys. Additional keys may be purchased only from IBM. (Vendor will supply additional keys only to original purchaser.)

3275/3276/3277/3278/3732 Key (#2577741), each 2.50 NC NC

3601: The 3601 is shipped with two keys. Additional keys may be purchased from IBM. Indicate serial number of lock.

3601 Key, each 2.50 NC NC

3610, 3612: The 3610 mdl 2 and 3612 mdl 2 with the Journal Takeup with Locked Cover (#4651) special feature are shipped with two keys. Additional keys may be purchased from IBM. Indicate serial number of lock.

3610 mdl 2/3612 mdl 2 Key, each 2.50 NC NC

3610 mdl 4: The 3610 mdl 4 is shipped with two keys. Additional keys may be purchased from IBM. Indicate serial number of lock.

3610 mdl 4 Key, each 2.50 NC NC

3631: The 3631 is shipped with two keys. Additional keys may be purchased from IBM. Indicate serial number of lock.

3631 Key, each 2.50 NC NC

3653: The 3653 is equipped with a cash drawer lock and can be equipped with an optional journal lock (#9322). The terminal is shipped with two cash drawer keys. The cash drawer lock will be randomly selected unless specified otherwise from the M 3653 pages. If the customer wishes to add or replace keys or locks with a specific identification number (stamped on lock and key) he should state the 3653's machine serial number and the Key Identification Number. **Note:** Without a Key Identification Number, the order should state Machine Serial Number and the words "NEW LOCK REQUIRED." If the optional journal lock is specified, the terminal will be shipped with two journal keys also. Additional or replacement keys may be purchased from IBM or a local locksmith. Locks may be changed in the field.

3653 Cash Drawer Lock including two keys, Part No. 1851086, each 3.50 NC NC

3653 Cash Drawer Lock Key, ea (order by machine type & lock serial no) 2.50 NC NC

3653 Journal Lock, Part No. 5998329, each 3.50 NC NC

3653 Journal Lock Key, Part No. 5182265, ea (order by machine type and Part No.) 2.50 NC NC

3663: 3663 Supermarket Terminal stations are equipped with three locks and a complement of keys. Locks and keys are as follows:

Cash drawer lock - randomly selected lock, number unless specified otherwise from the M 3663 page (2 keys shipped as standard).

Till Lock - standard key fits all tills (1 key shipped as standard per till).

Summary Journal Lock (optional feature #4660) - standard key fits all summary journals (1 key shipped as standard per journal).

Additional or replacement keys may be purchased from IBM or a local locksmith. Locks may be changed in the field.

If the customer wishes to add or replace keys or locks with a specific identification number (stamped on lock and keys) he should state the 3663's Machine Serial Number and the Key Identification Number. If the customer does not specify key number, a new lock with keys will be randomly selected. **Note:** Without a Key Identification Number, the order should state Machine Serial Number and the words "NEW LOCK REQUIRED."

3663 Cash Drawer Key, ea (specify Machine Serial No. and Key Identification Number) 2.50 NC NC

3663 Till Key, each 2.50 NC NC

3663 Summary Journal Key, each 2.50 NC NC

3663 Cash Drawer Keylock with 2 keys. (Specify Machine Serial No. and the Key Identification Number being replaced) 3.50 NC NC



ACCESSORIES

LOCKS AND KEYS (cont'd)

		Purchase	MMMC	FIC
3683, 3684:	The 3683 and 3684 are equipped with a cash drawer lock and can be equipped with an optional Journal Lock (#4690), optional Manager Keylock (#4905), and (3684 only) optional Diskette Cover Lock (#3310). The cash drawer lock and all other locks ordered will be shipped with two keys. The cash drawer lock, journal lock, manager lock, and diskette cover lock will be randomly selected unless specified otherwise from the M 3683 and M 3684 pages. If the customer wishes to replace a unique lock the order should state the 3683 or 3684 machine serial number, lock name and the lock identification number (stamped on lock). (Note: Without an identification number, the order should state machine serial number, lock name and the words "NEW LOCK REQUIRED.") Additional or replacement keys may be purchased from a local locksmith. Locks may be purchased from IBM and may be changed in the field.			
	The following randomly selected locks may be ordered by part number.			
	3683/3684 Cash Drawer Lock including 2 keys, Part NO. 8543281, each	**	NC	NC
	3683/3684 Journal Lock, Part No. 8543620, each	**	NC	NC
	3683/3684 Manager Lock, Part No. 8547992, each	**	NC	NC
	3684 Diskette Cover Lock, Part No. 8543620, each	**	NC	NC
3735:	The 3735 with Keylock (#4695) special feature is shipped with two keys. Additional or replacement keys may be purchased only from IBM. Key Identification Number (stamped on key and lock barrel) must be specified on each order. A new Keylock (#4695) special feature must be ordered if the Key Identification Number cannot be supplied.			
	3735 Key, each	2.50	NC	NC
	3747 Key, each	2.50	NC	NC
	3747 Lock, field installation ... for rental customer, each	11.00SUC	NC	NC
	3747 Lock, field installation ... for purchase customer (price based on return of old lock to IBM), each	11.00	NC	NC
3767:	The 3767 with Security Keylock (#6660) feature is shipped with two keys. Additional or replacement keys may be purchased only from IBM. Key Identification Number (stamped on key and lock barrel) must be specified on each order. A new Security Keylock (#6660) special feature must be ordered if the Key Identification Number cannot be supplied.			
	3767 Key, each.	2.50	NC	NC
3289-3, 3771, 3773, 3774, 3775, 3776, 3777:	The 3289-3, 3771, 3773, 3774, 3775, 3776 or 3777 with Keylock (#4650) special feature is shipped with two keys. Additional or replacement keys may be purchased only from IBM. A customer authorization letter with Key Identification Number stamped on key and lock barrel) must accompany each order.			
	3289-3, 3771, 3773, 3774, 3775; 3776, 3777 Key, each	2.50	NC	NC
3780:	The 3780 with Keylock (#4650) is shipped with two keys. Additional or replacement keys may be purchased only from IBM. Identification number (stamped on key) must be specified on each order. Without Key Identification Number, a new Keylock (#4650) must be ordered.			Key Note:
	3780 Key, each	2.50	NC	NC
3760, 3762, 3791, 3792:	The 3760, 3762, 3791 or 3792 with Security Keylock (#6350) is shipped with two keys. Additional keys may be purchased only from IBM. Indicate serial number of lock on the order.			
	3760, 3762, 3791 or 3792 Key, each	2.50	NC	NC
3793:	The 3793 Powerline Keylock (#5560) is shipped with two keys. Additional or replacement keys may be purchased from IBM. Identification Number (stamped on key) must be specified on order. Key Identification Number, a new feature (#5560) must be ordered.			Key Note: Without
	3793 Key, each	2.50	NC	NC
8130, 8140, 8101:	The 8130, 8140 or 8101 with Keylock (#4655) is shipped with two keys. Additional keys may be purchased only from IBM. Indicate serial number of lock on the order.			
	8130, 8140, 8101 Key, each	2.50	NC	NC
8775:	The 8775 with the Security Keylock (#6340) feature is shipped with two keys. Additional keys may be purchased only from IBM. (Vendor will supply additional keys only to original purchaser.)			
	8775 Security Key, each	(to be announced)	NC	NC
8775:	The 8775 with the Set Up Keylock (#1009) feature is shipped with two keys. Additional keys may be purchased only from IBM. (Vendor will supply additional keys only to original purchaser.)			
	8775 Set Up Key, each	(to be announced)	NC	NC

** Purchase Price to be announced.



ACCESSORIES

MOTOR GENERATOR AND STARTER
(S/370 - 3032, 3033, 3165, 3168)

These units are not manufactured by IBM and are available on a purchase only basis. Units must be ordered one year in advance of installation. Manufacturer's warranty will be extended to the purchaser. Installation, checkout and maintenance will not be provided by IBM and any expenses involved must be borne by the customer.

see S/360 Installation Planning Manual, GC22-6820, for installation requirements.

For S/370 mdl 165, 168, 3032 or 3033 Processor: If a motor generator set is chosen as the power source, then one Motor Generator Set (with internally mounted starter) is required for each S/370 mdl 165 and 168, 3062 Attached Processing Unit and 3032 or 3033 Processor. Two are required for a 168 MP system, one for each MP CPU. **Specify:** Feature # for Motor Generator Set on 3032, 3033, 3062, 3165 or 3168 machine order

	Feature	Purchase Price†
208/230 VAC, 3-phase, 60 Hz - Motor Generator Set	#9447	\$20,400
440 VAC, 3-phase, 60 Hz - Motor Generator Set	9449	20,400

Note: If more than one MG set is desired on initial order, specify quantity at the indicated prices.

If additional MG set is to be ordered for delivery after system, order as follows:

	Part No.	Purchase Price†
Motor Generator Set ... 208/230 VAC	2574790	\$20,400
Motor Generator Set ... 440 VAC	2574290	20,400

† FOB shipping point with freight prepaid designation within the 48 contiguous states. For domestic accounts outside the 48 contiguous U.S., transportation costs are prepaid to port of embarkation in the U.S.

PIN FEED PLATENS
(1033, 1447, 2213 mdl 1, 2740, 2741, 3713, 3735, 3793)

For feeding of continuous forms that have pre-punched feed holes. On any one machine, one pin feed platen may be ordered for shipment with the machine in lieu of the standard solid platen. The platen becomes the property of the customer and cannot be returned for credit. order the applicable Feature # indicated below.

Regular Pin Feed Platen - available for 1033, 1447, 2213 mdl 1, 2740, 2741, 3674, 3735, 3793.

3713 - a pin feed platen with 6 lines/inch spacing is standard on the 3713. On initial machine order, any one of three hole-to-hole forms widths may be specified ... see 3713 "Machines" page. If Adjustable Margin Feature (#1115) is ordered, any one hole-to-hole forms width from 5-1/4" to 13-7/8" (#9151 thru #9168 ... see below) may be ordered in lieu of the choice listed under "Specify" on the 3713 "Machines" page.

	Feature	Purchase	MMMC	FIC
For 1033, 1447, 2213 mdl 1, 2740, 2741, 3735, 3793. In lieu of standard friction feed platen (max., one per machine) ... on 3735 or 3793, only 6 lines/inch is available.	#9509	\$ 61.75	NC	PO**

Specify: [1] #9509 at price indicated ... [2] Line Spacing and Hole-to-hole width: One feature #, depending upon forms width and line spacing, from "Line Spacing" below **Prerequisite:** On 1447, 2213 mdl 1, 2740 and 2741, the appropriate Feature # for line spacing on the basic machine (#9435 for 6 lines/inch, or #9436 for 8 lines/inch) is required ... see "Specify" under each unit in "Machines."

Line Spacing - with either #9509 or #9510, one of the following Feature #s must be specified in accordance with line spacing and hole-to-hole width of the forms which will be used.

Over-all Forms Width	Hole-to-hole Width	Writing Line	Fea. # for Line Spacing	
			6 Lines/Inch	8 Lines/Inch
5-3/4"	5-1/4"	4-5/8"	#9151	—
6-1/2"	6"	5-3/8"	9152	#9272
8"	7-1/2"	6-7/8"	9153	9273
8-1/2"	8"	7-3/8"	9154	9274
9-1/2"	9"	8-3/8"	9155	9275
9-7/8"	9-3/8"	8-3/4"	9156	—
10-3/8"	9-7/8"	9-1/4"	9157	—
10-1/2"	10"	9-3/8"	9158	9278
10-5/8"	10-1/8"	9-1/2"	9159	9279
11-3/4"	11-1/4"	10-5/8"	9160	9280
12"	11-1/2"	10-7/8"	9161	9281
13"	12-1/2"	11-7/8"	9167	9287
13-5/8"	13-1/8"	12-1/2"	9162	9282
14-3/8"	13-7/8"	13-1/4"	9168*	9288*

SPLIT FRICTION FEED PLATEN
(for 2740 mdl 2)

[Plant installation only] A two section platen with the split located to provide a 5-1/2" printing line on the left and 7-1/2" printing line on the right. **Prerequisite:** Document Insertion (#3401 or #3402) and Line Feeding, 6 lines/inch (#9435) on the 2740 mdl 2. **Note:** On any one machine, only one split friction feed platen may be ordered for plant installation in lieu of the standard friction feed platen. For additional friction feed platens, split friction feed platens,

	Feature	Purchase	MMMC	FIC
Split Friction Feed Platen, in lieu of friction feed Platen ... maximum, one per machine.	#9600	\$ 76	NC	PO

* Available only for 2213 mdl 1, 2740, 2741 or 3713. Use of this platen on the 2740/2741 does not extend the writing line beyond 13".
** #9509 at the prices indicated are to be used only for ordering the plant installation of a pin feed platen in lieu of the standard friction feed platen on original orders for these machines.



ACCESSORIES

PRINT BELT, ADDITIONAL [3288, 3289, 3775, 3776, 3784, 3791, 3792]

Permits customer to obtain more than one character set print belt for various applications.

	Feature	Purchase	MMMC	FIC
For 3288: 64-character EBCDIC	5920	160	—	—
120-character TN/T11 EBCDIC, Sans Serif font	5921	160	—	—
A metal belt with engraved font. See appropriate "Machines" page for restrictions and limitations. The belt can be used interchangeably with the one provided on the machine.				
120 LPM Max — 3775				
155 LPM Max — 3289-1, 3784, 3791, 3792				
300 LPM Max — 3776-1				
400 LPM Max — 3289-2, 3, 4, 3776-2				
Available in EBCDIC and ASCII character arrangements.				
For 3289*, 3776, 3784, 3791, 3792	48-character ASCII	5811**	160	—
For 3289*, 3775, 3776, 3784, 3791, 3792	64-character ASCII	5812**	160	—
For 3289*, 3775, 3776, 3784, 3791, 3792	94-character ASCII	5813**	160	—
For 3776	48-character EBCDIC (HN Character Set)	5820	160	—
For 3289, 3776, 3784, 3791, 3792	48-character EBCDIC	5821	160	—
For 3289, 3775, 3776, 3784, 3791, 3792	64-character EBCDIC	5822	160	—
For 3289, 3775, 3776, 3784, 3791, 3792	94-character EBCDIC	5823	160	—
For 3289	125-char Text Print EBCDIC	5824	160	—
For 3791, 96-char EBCDIC (word processing)	Courier Typestyle	5831	170	—
For 3791, 96-char EBCDIC (word processing)	Artisan Typestyle	5832	170	—
For 3791, 128-char EBCDIC (data & word processing) & ASCII		5833	170	—
410 LPM Max — available in EBCDIC and ASCII character arrangements.				
For 3791	48-character EBCDIC/ASCII	5825	160	—
For 3791	64-character EBCDIC	5826	160	—
For 3791	94-character EBCDIC	5827	160	—
For 3791, 128-char EBCDIC (data & word processing) & ASCII		5834	170	—

* 3289 mdl 1 and 2 only.

** ASCII Feature (#1201) is prerequisite on 3775 or 3776. For 3784, ASCII Feature (#1201) is prerequisite on 3774. ASCII Feature (#9022) required on 3791. For 3289, SCS Operation is not available with ASCII.

PRINT BELT, ADDITIONAL [3262]

Permits the customer to obtain more than one character set print belt for various applications. When ordering, use one feature# for character set size and one feature # for character height. Installation and replacement of these belts are the customer's responsibility. If customer desires to have IBM Field Engineering replace or install the print belt, the CE time will be billed to the customer.

	Feature	Purchase	MMMC
48-character EBCDIC	#5940	\$170	—
64-character EBCDIC (optimized)	5946	170	—
64-character EBCDIC	5944	170	—
96-character EBCDIC	5948*	170	—
Character Set Height			
2.0mm (.079")	5951		
2.4mm (.095")	5950		

* Available only with 2.4mm (.095") character height (#5950).

3274, 3276, 3776, 3777, 8775

MERCURY BATTERY

To provide power to sustain the master key of the Encrypt/Decrypt feature (#3680) on the 3274 Control Unit, 3276 Control Unit Display Station, 3776 Communication Terminal mdl 3 or 4, 3777 Communication Terminal mdl 3, or maintain customer set up information in 8775 Display Terminal when normal power is not present. A 4.14 volt mercury battery (IBM Part No. 1743456). This battery has a shelf life of 1 year under normal conditions, and can be expected to provide 3.5 years of normal service.

Discharged batteries should be returned to IBM for disposal. Return information is printed on the label of the battery.

	Purchase	MMMC
Mercury Battery, IBM Part No. 1743456	\$ 17	—



ACCESSORIES

**3683/3684
TOTALS RETENTION
BATTERY**

To provide power for 240 bytes of storage to secure totals, transaction sequence number, terminal address, and other user defined data against power off or power interruptions. Power source (Eveready #E134, Mallory TR134R or equivalent) is customer replaceable. The capacity rating of these type batteries when new is approximately 1000 millamp hours. The life of the battery is determined by the shelf life which is approximately 9000 hours. This means that if a battery is installed in a 3683 or 3684 six months after manufacture, its useful machine life will be 6 months on the average.

It is recommended that the users' program test the battery state at least once per day. When the battery condition reaches the low threshold state, there is approximately 72 hours of battery life left. Procurement and replacement of the battery is the customer's responsibility. Customer must ensure that the power is "ON" the terminal when the battery is replaced or all information will be lost.

**3683/3684
STORAGE RETENTION
BATTERY**

To provide power to retain data and programs in main storage and registers during primary power interruption. A 12.5 volt battery is shipped with the initial order for this feature (Storage Retention #7785). For replacement batteries order IBM Part Number 8543856 (or equivalent)

	Purchase	MMMC
Nickel Cadmium Battery, IBM Part No. 8543856	**	—

** To be announced.

ACCESSORIES

3600 ACCESSORIES Accessories for 3600 System equipment may be purchased from IBM or a customer selected source.

	Part Number	Description	Purchase Price
3601 mdl 1			
	78999	Fuse (.5 Slow Blow)	\$ 0.55
3603			
	111262	Fuse (.4 Slow Blow)	0.45
	1176668	Fuse (1.5A Slow Blow)	0.80
3604 Keytop Labels Mdl's 1, 2, 3, 4			
	1561332	Blank Base for Customization	0.90
	1562333	Clear Protective Overlay	1.10
	1561341	Preprinted (Group 1)	2.40
	1561342	Preprinted (Group 2)	2.45
3604 Overlays Models 5,6			
	4942506	White Background 45 Key	2.30
	4942515	Blue Insert 15 Key	1.65
	4943749	Clear Protective Cover 45 Key	1.40
3606/3608			
	1652103	Fuse Holder Assembly	1.50
	1702817	Display Filter - Standard	3.45
	1702847	Keyboard Overlay - Standard	1.65
	1702848	Keyboard Overlay - Blank except for Numerics	1.65
	1702849	Keyboard Overlay - Protective Cover	0.50
	1702867	Keyboard Overlay - Std Fctn Key Nomenclature Calculator Numeric Arrangement	1.65
	1702904	Display Filter -Blank Red	2.05
	1702934	Keyboard Overlay - Blank Fctn Key Nomenclature Calculator Numeric Arrangement	1.65
3603			
	1745353	Jumper Assembly (Signal Attenuation)	1.05
	5929886	Wall Plate Assembly	13.50

The following accessories may be obtained

Diskettes ... Magnetic Passbook Labels ... Ink Rolls ... 3618 Printer Ribbon

**3600 System
LOOP REPEATER**

(P/N 4400002) Plugs into the Loop cable and redrives all signals being transmitted in a 3600 Finance Communication System. Each Loop Repeater contains Loop redriving capabilities which allow for the extension of the Loop cable length by 2000 feet. Loop Repeaters may be employed on a Loop to extend its overall length to a maximum of 20,000 cable-feet. The unit can be physically mounted on a wall in an out-of-the-way location.

Prerequisite: An operating 3600 System Local Loop or Remote Subloop.

Bibliography: GC22-0005

Customer Responsibilities: The customer must be advised that: [1] The customer is responsible for making certain that the use of the equipment complies with all Federal, State, and Local Laws, Regulations, and Ordinances ... [2] The customer is responsible for price quotations, installation and cost (initial and recurring) of common carrier equipment and service ... [3] The customer is responsible for the set-up of the unit ... [4] The customer will determine the failing unit (see "Maintenance" below) ... [5] The customer is responsible for determining the required number of spares.

Physical Planning and Set-up: Physical planning and set-up is the responsibility of the customer. Attachment to the Loop cable is provided by ordering External Signal Cable Assembly (IBM P/N 1745372), or equivalent ... see *IBM 3600 Finance Communication System Installation Manual - Physical Planning*, GA27-2766.

Spares: The customer may wish to replace a failing unit with a spare and must be advised to purchase sufficient spare units for such use. The number of spare units recommended is dependent upon the number of units the customer has installed, application requirements, physical locations and layouts. However, the minimum number of spare units recommended is shown in the following table:

Number of Loop Repeaters Installed	Minimum Number Spares Recommended	Number of Loop Repeaters Installed	Minimum Number Spares Recommended
100	2	2500	12
200	2	3000	14
300	3	3500	16
500	4	4000	18
1000	6	4500	19
1500	9	5000	21
2000	10		

Warranty: Service is available at the designated IBM Repair Center during the 90 day warranty period, which commences 30 days following date of shipment from the plant of manufacture (Raleigh). It shall be the customer's responsibility to set up the equipment. It shall be the customer's responsibility to determine the failing unit and remove it from the Loop, and if the unit is still under warranty, to pack it in the designated shipping container and ship it prepaid to the designated IBM Repair Center. IBM will return the serviced unit, shipping charges prepaid. There is no regularly scheduled preventative maintenance recommended by IBM on these units.

Maintenance agreements are not available. FE on-site service will not be provided.

Ordering: Order Part No. 4400002

	Machine	Part No.	Purchase Price
Loop Repeater, each	3601	4400002	\$ 350
Loop Repeater, each	3602	4400002	350

ACCESSORIES

3614 LOGO PANEL
#9401 or #9402

A purchase only accessory for either a 3614 mdl 1, 2, 11 or 12. The personalization panel provides an area on the top half of the front of the 3614 that can be personalized by the customer (silk-screened, painted, etc.). The area is provided for customer name and/or advertising purposes.

Logo Panel	Feature	Purchase Price
If #9401 is specified, logo panel will be shipped with 3614	#9401	\$ 84.75
	Part No.	Purchase Price
If #9402 is specified, logo panel will be shipped prior to 3614.	2750814	\$ 84.75

Note: Additional logo panels, Part No. 2750814, may be ordered at the price indicated above.

3614 MODEL 2/12
ACCESSORY GROUP

[Purchase Only] The 3614 Model 2/12 Accessory Group consists of a heavy duty enclosure, a through-the-wall bezel and a mounting stand.

Heavy Duty Enclosure: Provides a strong steel enclosure for the through-the-wall configuration. This enclosure has a rear access door with a resettable combination lock and a provision for a keylock. The combination for the combination lock is set by the customer. The customer must provide the actual keylock and the key. **Limitation:** For 3614 mdl 2 or 12 only.

Through-the-Wall Bezel: Provides a frame around the through-the-wall portion of the 3614 mdl 2 or 12 and provides a casement for the hole in the wall.

Mounting Stand: Provides a support stand for the 3614 mdl 2 or 12 that comes in three different heights. **Specify:** Height - #9572 for 4", #9573 for 7", or #9574 for 10".

3614 Model 2/12 Accessory Group	Feature	Purchase Price
	#9571	\$ 4,500

Note: These items are provided as accessories to the 3614 mdl 2 or 12 to facilitate installation of the 3614 mdl 2 or 12 through-the-wall. Installation, checkout, and maintenance of these items will not be provided by IBM. All responsibility and expenses involved must be borne by the customer.

Warranty for 3614 Model 2/12 Accessory Group: For 90 days commencing on the date of installation or 30 days after shipment, whichever comes first, these accessories are warranted free from defects in materials and workmanship. IBM's obligation is limited to providing replacement parts on an exchange basis.

Delivery Instructions:

Due to installation requirements, the Accessory Group will generally be shipped three weeks prior to the 3614.

The "Heavy Duty Enclosure" included in this Accessory Group is, in effect, a steel safe with dimensions of approximately 43" x 28" x 63" and weighing approximately 2800 pounds. It does not have casters and will be transported on a skid. The item will be shipped via common carrier to the delivery point designated by the customer and will probably require special handling or rigging at destination. The customer should be advised that it is suggested this item be delivered directly to a local drayman that has the facilities to move an item of these dimensions and weight. The customer should then make local provisions to have the Accessory Group delivered for physical installation at the selected site.

Close coordination should be maintained with the customer, Customer installation responsibilities should be noted as described in the 3614 "Machines" pages and in this section.



ACCESSORIES

3624 MODELS 2 and 12 ... INSTALLATION ACCESSORIES

[Purchase only] Provide heavy-duty steel enclosure, through-the-wall bezel, front trim border, front dress panel, and pedestal base for installation of mdls 2 and 12 in configurations suitable for walk-up or drive-up use.

A heavy-duty enclosure is required. Two heavy-duty enclosures are available. A single function enclosure houses the currency dispensing mechanism on mdls 2 and 12 that do not have a depository. A dual function enclosure houses both the currency dispensing and the depository mechanisms on mdls 2 and 12 that have a depository. The dual function enclosure can also be used to house the currency dispensing mechanism only, on mdls 2 and 12 that do not have a depository. Both enclosures have a single rear access door that includes a combination lock. The combination of the combination lock is set by the customer. A second combination lock is available as an optional feature. A dial keylock is available. Both enclosures have a penetration-detection alarm grid across the inside of the front face. Construction of the heavy-duty enclosures meets requirements of UL291 and complies with the intent of U. S. Federal Regulation P for unattended paying and receiving machines.

Pedestal bases are available in a number of sizes to mount the enclosure at a height most suitable for walk-up or drive-up use. The recommended nominal mounting heights are 1321 mm (52 inches) from keyboard centerline to walkway for walk-up use and 1067 mm (42 inches) from keyboard centerline to driveway for drive-up use. The difference in elevation between walkway or driveway and the mounting surface should be considered in selecting the pedestal height ... refer to *Installation Manual - Physical Planning*, GA27-2766 and GA26-1658. A lockable storage cabinet with standard key is included in the pedestal base. A lockable storage cabinet only is also available that can be used with the dual function heavy-duty enclosure to mount the enclosure directly to a floor surface where a pedestal is not required.

A through-the-wall bezel, front trim border that fits around the bezel, and front dress panel that fits within the bezel are required. Two through-the-wall bezels are available - one with a recessed bezel providing a convenient shelf surface for user and recommended for a walk-up installation, and another with a non-recessed bezel positioning the user guidance area nearer the outside wall surface for more convenient use by a vehicle occupant and recommended for a drive-up installation. Two front trim borders are available -- one with an envelope holder for depository transactions, and another without an envelope holder.

Warranty: These accessories are warranted free from defects in materials and workmanship for 90 days, commencing either on the date of installation or 30 days after shipment, whichever occurs first. IBM'S obligation is limited to providing replacement parts on an exchange basis during the warranty period.

Delivery Instructions:

The "Heavy-Duty Enclosure" included in this group of accessories is a steel enclosure with dimensions of approximately 432 mm x 914 mm x 1575 mm (17" x 36" x 62") and weight of approximately 950 kg (2100 pounds) for the dual function unit, and dimensions of approximately 432 mm x 914 mm x 991 mm (17" x 36" x 39") and weight of approximately 680 kg (1500 pounds) for the single function unit. The enclosure does not have casters and will be transported on a skid.

The item will be shipped via common carrier to the delivery point designated by the customer and may require special handling or rigging at destination. The customer should be advised that it is suggested this item be delivered directly to a local drayman that has facilities to move an item of these dimensions and weight. The customer then should make local provisions to have the enclosure delivered for physical installation at the selected site.

Heavy-Duty Enclosure, Single Function (#3901): Used to enclose currency dispensing mechanism on 3624 mdls 2 or 12 that do not have a depository. **Prerequisites:** Bezel, Through-the-Wall (#1490 or 1491), Front Dress Panel (#3951), and Front Trim Border Without Envelope Holder (#3962). **Note:** Pedestal (#4901), that includes a lockable storage cabinet, is available in several heights to mount the single function enclosure. **Limitation:** Cannot be installed with Depository, Through-the-Wall (#3243), Pedestal for Dual Function Heavy-Duty Enclosure (#4902), Storage Cabinet for Dual-Function Heavy-Duty Enclosure (#4903), or Front Trim Border with Envelope Holder (#3961). Single Function Heavy-Duty Enclosure (#3901) cannot be field upgraded to a Dual Function Heavy-Duty Enclosure (#3902).

Heavy-Duty Enclosure, Dual Function (#3902): Used to enclose the currency dispensing and the depository mechanisms on 3624 mdls 2 or 12 that have a depository. May also be used to enclose the currency dispensing mechanism only and provide spare lockable storage space on 3624 mdls 2 or 12 that do not have a depository. **Prerequisites:** Bezel, Through-the-Wall (#1490 or 1491), Front Dress Panel (#3951), and Front Trim Border, With or Without Envelope Holder (#3961 or 3962). **Note:** Pedestal (#4902), that includes a lockable storage cabinet, is available in several heights to mount the dual function enclosure ... a lockable storage cabinet only (#4903) is also available to mount dual function enclosure directly to a floor surface where a pedestal is not required. **Limitation:** Cannot be installed with Pedestal for Single Function Heavy-Duty Enclosure (#4901). Single Function Heavy-Duty Enclosure (#3901) cannot be field upgraded to a Dual Function Heavy-Duty Enclosure (#3902).

Dial Keylock (#3310): (Optional) Provides keylock for the combination dial on a heavy-duty enclosure. Can be used where dual control and/or bank examiner type lock is desired. When locked, the combination dial cannot be turned. **Specify:** #9251 for key removable when locked or unlocked, dial must be locked by key ... #9252 for key removable when locked or unlocked, indicator is pushed in to lock the dial automatically ... #9253 for key removable when locked only, dial must be locked by key. **Maximum:** One. **Limitation:** Installed on only one combination dial when Dual Lock (#3375) is also ordered. **Field Installation:** Available at time of manufacture only.

3624 Currency Area Lockoff (#3312): [Models 2 and 12 only] [Purchase Only] Provides a security panel to enclose the currency area. Enables the document feed mechanism to be locked in the machine. When used with the Depository Cartridge Locking Feature (#3150), it restricts access to the currency area during normal operational servicing of the depository and/or other areas of the 3624. Includes keylock and standard key. **Note:** This accessory does not change the customer's responsibility to remove any currency in the 3624 when the unit has to be serviced by a CE. If customer desires to change lock and/or key provided, customer is responsible for their procurement and installation. **Limitation:** Cannot be installed with Heavy-Duty Enclosure, Single Function (#3901). **Maximum:** One.

Dual Lock (#3375): (Optional) Provides second combination-lock on rear access door. **Field installation:** No.

Bezel, Through-the-Wall, Recessed (#1490), Non-Recessed (#1491): Bezel for through-the-wall installation of



ACCESSORIES

3624 MODELS 2 and 12 ... INSTALLATION ACCESSORIES (cont'd)

3624. #1490 is recessed, providing a shelf surface, and is recommended for walk-up installation. #1491 is non-recessed, placing the user guidance area nearer the outside wall surface for convenience of a vehicle occupant, and is recommended for drive-up installation. **Prerequisites:** Heavy-Duty Enclosure, Single or Dual Function (#3901 or 3902), Front Dress Panel (#3951), and Front Trim Border With or Without Envelope Holder (#3961 or 3962).

Pedestal for Single Function Heavy-Duty Enclosure (#4901): For mounting 3624 mdls 2 or 12 that use the single function enclosure. Consists of a base stand and a lockable storage cabinet. A standard key is provided. Available in heights to position the keyboard centerline 1067, 1194, or 1321 mm (42, 47, or 52 inches) from mounting surface. **Note:** If single function enclosure is installed without a pedestal, the keyboard centerline is 368 mm (14.5 inches) from mounting surface. **Prerequisite:** Heavy-Duty Enclosure, Single Function (#3901). **Limitation:** Cannot be installed with Heavy-Duty Enclosure, Dual Function (#3902). **Specify:** Height of keyboard centerline from mounting surface:

#9701 1067 mm (42 inches)
#9702 1194 mm (47 inches)
#9703 1321 mm (52 inches)

Pedestal for Dual Function Heavy-Duty Enclosure (#4902): For mounting 3624 mdls 2 or 12 that use the dual function enclosure. Consists of base stand and a lockable cabinet. A standard key is provided. Available in sizes to position the keyboard centerline 1067, 1194, or 1321 mm (42, 47, or 52 inches) from mounting surface. **Note:** See Storage Cabinet for Dual Function Heavy-Duty Enclosure (#4903) for installing with keyboard centerline height lower than 1067 mm (42 inches) from mounting surface. **Prerequisite:** Heavy-Duty Enclosure, Dual Function (#3902). **Limitation:** Cannot be installed with Heavy-Duty Enclosure, Single Function (#3901). **Specify:** Height of keyboard centerline from mounting surface:

#9701 1067 mm (42 inches)
#9702 1194 mm (47 inches)
#9703 1321 mm (52 inches)

Storage Cabinet for Dual Function Heavy-Duty Enclosure (#4903): Lockable storage cabinet only, for 3624 mdls 2 or 12 dual function enclosure mounted directly to floor surface without pedestal. The keyboard centerline height is 965 mm (38 inches) from mounting surface. A standard key is provided. **Prerequisite:** Heavy-Duty Enclosure, Dual Function (#3902). **Limitation:** Cannot be installed with Heavy-Duty Enclosure, Single Function (#3901). **Note:** Storage cabinet is included with the Pedestal for Dual Function Heavy-Duty Enclosure (#4902).

Front Dress Panel (#3951): Provides panel to cover face of heavy-duty enclosure and I/O module. **Prerequisites:** Bezel, Through-the-Wall, Recessed or Non-Recessed (#1490 or 1491), and Heavy-Duty Enclosure, Single or Dual Function (#3901 or 3902).

Front Trim Border, With Envelope Holder (#3961), Without Envelope Holder (#3962): Provides trim paneling around the bezel to seal through-the-wall installation. #3961 includes built-in depository envelope holder and is available only when the depository feature is installed. #3962 does not include a depository envelope holder. **Prerequisites:** (1) Bezel, Through-the-Wall, Recessed or Non-Recessed (#1490 or 1491) ... (2) Front Trim Border, With Envelope Holder (#3961) requires Depository, Through-the-Wall (#3243).

ACCESSORY PRICES:		Feature	Purchase	MMC
Heavy-Duty Enclosure, Single Function	[one req'd]	#3901	\$1,860	N/A
Dual Function		3902	2,290	N/A
Dial Keylock	[optional]	3310	65	N/A
(see "Specify" above for keying options)				
3624 Currency Area Lockoff		3312	120	N/A
Dual Lock	[optional]	3375	136	N/A
Bezel, Through-the-Wall, Recessed	[one req'd]	1490	303	N/A
Non-Recessed (Drive-up use)		1491	259	N/A
Pedestal, (includes storage cabinet) for Single Function Heavy-Duty Enclosure	[optional]	4901	759	N/A
(see "Specify" above for mounting height)				
for Dual Function Heavy-Duty Enclosure		4902	393	N/A
(see "Specify" above for mounting height)				
Storage Cabinet for Dual Function Heavy-Duty Enclosure [Optional]		4903	182	N/A
[Keyboard height = 965 mm (38 inches)]				
Front Dress Panel	[one req'd]	3951	215	N/A
Front Trim Border, With Envelope Holder	[one req'd]	3961	237	N/A
Without Envelope Holder		3962	122	N/A

3624 MODELS 1 and 11 ... PEDESTAL, LOBBY (#5510):

[Purchase only] Provides optional mounting stand for 3624 mdls 1 or 11 that do not have depository feature. **Note:** A pedestal base with casters is included with the lobby model depository special feature. **Limitation:** #5510 cannot be installed with Depository, Lobby (#3233).

ACCESSORY PRICES:	Feature	Purchase	MMC
Pedestal, Lobby	#5510	\$ 467	N/A

3624 LOGO PANEL (#9401, 9402 or 9403):

[Purchase only] Backlighted Logo Panel, suitable for customization by silkscreening or other acceptable process.

ACCESSORY PRICES:	Feature	Purchase	MMC
If #9401 is specified, logo panel will be shipped with 3624	#9401	\$ 48	N/A
If #9402 is specified, logo panel will be shipped approximately three weeks prior to 3624. Note: More than one panel may be ordered when #9402 is specified (e.g., customer may desire to order spares or to arrange to have several panels delivered for customization at one time). When more than one panel is ordered using #9402, then #9403 should be specified on the other 3624s to avoid duplicating orders for logo panels.	9402	48	N/A

If #9403 is specified, logo panel will not be ordered with 3624 and must have been ordered either separately by part number through MES or as #9402 on another 3624. To order by Part Number



ACCESSORIES

	Machine	Part No.	Purchase
	Logo Panel 3624 mdl 1 or 11	945618	\$ 48
	Logo Panel 3624 mdl 2 or 12	945617	48

Note: Additional logo panels can be ordered by Part Numbers 945617 or 945618 at the price indicated above.

3624 CURRENCY CARTRIDGE:

[Purchase only] Portable currency container, interchangeable between 3624s. Cartridge case is made of a high-impact resistant, fire retardant material. Removable access cover and built-in carrying handle, for ease of loading and transportation. Locking mechanism provides for customer installation of keylock and affixing security seals to help prevent unauthorized access to contents during storage or transport of the cartridge. The cartridge is connected to a cartridge drive station in the 3624 for power and communication of cash-low and cash-out currency levels. A keying system is provided so that a match between the cartridge and the cartridge drive station must be satisfied before the cartridge can be properly loaded in the drive station. The maximum new bill capacity is 2300 bills. The used bill capacity is approximately 1700.

Customer Responsibilities - 3624 Currency Cartridge: The customer must be advised that: (1) The customer is responsible for determining if the cartridge is the failing unit ... (2) The customer should schedule the frequency of cleaning and belt replacement procedure for optimum cartridge performance according to the usage, to maintain maximum machine availability ... (3) The customer may repair cartridge or send back to Repair Center (see "Maintenance" below ... (4) The customer is responsible for determining required spares (see "Spares" below) ... (5) The customer is responsible for providing cartridge for CE 6324 maintenance and testing; a minimum of one spare cartridge for mdls 1 and 2 and two spare cartridges for mdls 11 and 12 must be made available by customer to the CE for normal 3624 maintenance ... (6) The customer is responsible for setting the keying system on the cartridges and drive stations so that there is the desired match of currency denomination to drive station ... (7) Purchaser agrees that IBM is relieved of responsibility for all claims, including, but not limited to, loss of currency or documents contained in, dispensed by, or associated with the cartridge.

Spares: The customer may wish to replace (1) an empty or partially loaded cartridge with a fully loaded cartridge, (2) a failing cartridge with a spare for problem determination or while malfunctioning cartridge is being repaired, (3) a cartridge to enable the IBM CE to perform 3624 maintenance and testing. The customer should be advised to purchase sufficient cartridges to cover the above uses. The number of cartridges recommended is dependent upon the total number of cartridge drive stations the customer has installed, application requirements, physical location of 3624s, and location where cartridges are temporarily stored and loaded. The customer must be advised that it is recommended that spare cartridges should remain in use and not be stored for extended periods. A recommended quantity of spare cartridges and spare replacement belts per cartridge drive station is shown below. It assumes for every loaded cartridge installed in a cartridge drive station, another cartridge is available for currency replenishment. In addition, approximately one spare is available for every three cartridge drive stations. This should provide sufficient quantity of spares for customer and CE 3624 testing and for temporary replacement of cartridges in repair. These quantities should be adjusted to the customer's particular application requirements once the physical environment and usage affect on the cartridge and belt wear is understood. The customer can replace separator and restraint belts in conjunction with performing the recommended operator cleaning and belt replacement procedure. Belts can be ordered

Cartridge Drive Stations (*)	Recommended Quantity of Cartridges (including spares)	Recommended Minimum Quantity Spare Replacement Belts	
		Separator Belt P/N 945307	Restraint Belt P/N 945242
1	3	1	1
2	5	1	1
3	7	1	1
4	10	2	2
5	12	2	2
6	14	2	2
7	17	3	3
8	19	3	3
9	21	3	3
10	23	3	3

* 24 mdls 1 and 2 have one cartridge drive station and mdls 11 and 12 have two cartridge drive stations.

Cartridges and belts required for more than ten drive stations can be extrapolated from the above table by taking a multiple of these numbers. Additional quantities over the recommended minimum quantity of spare replacement belts should be ordered as required, as part of the customer periodic belt inspection and replacement schedule for cartridges (in conjunction with IBM'S general recommendation).

Maintenance: Cartridges are not maintained by IBM under the normal lease agreement or MMMC for purchased machine. A recommended operator cleaning and belt replacement procedure is provided in the *IBM 3624 Cartridge Owner's Manual*, GA66-0005; under adverse operator conditions, it is the customer's responsibility to modify the procedure to meet his own particular requirements. The customer can replace separator and restraint belts in conjunction with performing the recommended procedure. If the cartridge is in need of repair, he can send it to a designated IBM Repair Center. It is the customer's responsibility to package the unit in the designated shipping container and ship it prepaid to the designated IBM Repair Center.

IBM Repair Center Service: For cartridge repair, the customer will fill out an *IBM Repair Authorization Form*, GX27-2981, pack it and the defective cartridge in the designated shipping container, and ship it prepaid to the designated IBM Repair Center, where repair will be made if the cartridge is repairable. The charge for the repair of the cartridge at IBM Repair Center will cover handling, inspection, cleaning, repair, adjustment, testing, and return shipping. Billing will be at IBM's applicable hourly rates. In addition, all parts needed will be billed at IBM's prevailing parts prices. Alternately, upon request, the IBM Repair Center will provide, for a minimum charge, an estimate of repair charges.

If on the basis of an inspection, the repair center concludes that a cartridge is not repairable, no further work will be performed and the cartridge will be returned to the customer with a minimum charge to cover handling, inspection, testing, and return shipping charges.

Warranty: The cartridge is warranted to be free from defects in workmanship and material for a period of 90 days, commencing either on the date of installation or 30 days after shipment, whichever occurs first. Warranty service for the cartridge will be performed at the IBM Repair Center. If warranty service is performed at an IBM Repair



ACCESSORIES

3624 CURRENCY CARTRIDGE (cont'd)

Center, the customer will fill out an *IBM Repair Authorization Form*, GX27-2981, pack it and the defective cartridge in the designated shipping container, and ship it prepaid to the designated IBM Repair Center.

Ordering: Order by feature number below and specify quantity.

ACCESSORY PRICES:

	Feature	Purchase	MMMC
3624 Currency Cartridge	#9110	\$ 335	TM**

** Time and Material at IBM Repair Center only.

Note: For cartridge parts, refer to the *IBM 3624 Cartridge Owner's Manual*, GA66-0005.

3624 DEPOSITORY CARTRIDGE (3155):

[Purchase Only] Portable container for deposits. Required with Depository Cartridge Locking Feature (#3150). Capacity of approximately 300 deposited envelopes (certain conditions could cause capacity to vary). Cartridge case is made of a high-impact resistant, fire retardant material. Built-in carrying handle provides ease of loading and transportation. Locking mechanism provides for customer insertion of keylock. The cartridge is loaded into the 3624 depository in the closed and locked condition. During loading, the locking mechanism in the depository unlocks and slides the cartridge door open without allowing access to the contents of the cartridge. During unloading, the locking mechanism slides the cartridge door closed and locks it before the cartridge may be removed from the 3624. Cartridges can be opened only by a companion key corresponding to the key in the 3624.

There is also provision for affixing a seal to the locked cartridge. A mechanical counter, enclosed within the cartridge, is incremented each time the door is partially opened, providing an audit against unauthorized access.

Customer Responsibilities - 3624 Depository Cartridge: The customer must be advised that: (1) The customer is responsible for procurement and installation of cartridge lock and for installation of the companion cartridge lock key in the 3624 depository locking mechanism ... (2) The customer is responsible for determining required spare (see "Spares" below ... (3) The customer is responsible for determining if the cartridge is the failing unit ... (4) The customer is responsible for providing cartridge when required for CE 3624 depository maintenance and testing ... (5) The customer is responsible for replacement, if required, of the cartridge audit counter ... (6) Purchaser agrees that IBM is relieved of responsibility for all claims, including, but not limited to, loss of currency or documents contained in or associated with the depository cartridge ... (7) The customer will be responsible for removing, controlling and reloading all money and deposits in the 3624 when the unit has to be serviced by a CE.

Maintenance: Cartridges are not maintained by IBM under the normal lease agreement or MMMC for purchased machines. Replacement, if required, of the security lock and the internal audit counter in the cartridge is the responsibility of the customer. IBM Maintenance Agreements are not available. Field engineering on-site service will not be provided. IBM Repair Center service is not available.

Spares: To maintain continual depository operations at the ATM, at least two cartridges are required. Additional spares may be required, depending upon deposit volume between scheduled unloadings such as over weekends, physical location of 3624s, where cartridge contents are removed, where temporarily stored, and the needs for problem determination in the event of depository malfunctioning. A recommended nominal quantity of cartridges per 3624, including spares, is shown below. It assumes for every depository cartridge loaded in a machine, another cartridge has been unloaded, emptied and made available. In addition, approximately one spare is available for every five 3624s. This should provide sufficient quantities of spares for customer and CE 3624 testing and for replacement of inoperative cartridges. These quantities should be adjusted to the customer's particular system requirements.

3624s	Recommended Quantity of Cartridges (Including Spares)
1	3
2	5
3	7
4	9
5	11
6	14
7	16
8	18
9	20
10	22

Cartridges required for more than ten 3624s can be extrapolated from the above table by taking a multiple of these numbers.

Warranty: The cartridge is warranted free from defects in workmanship and material for a period of ninety (90) days, commencing either on the date of installation or 30 days after shipment, whichever occurs first. Defective cartridges will be replaced under the warranty provisions.

Ordering: Order by feature number below and specify quantity.

ACCESSORY PRICES:

	Feature	Purchase	MMMC
3624 Depository Cartridge	#3155	\$ 140	N/A

ACCESSORIES

3630 SYSTEM and 8100 SYSTEM - Loop Cable

Loop Cable may be purchased from IBM or a customer selected source. See *IBM 3630 Plant Communication System - Loop Installation Manual - Physical Planning, GA24-3676* or *8100 Information System Loop Installation Manual - Physical Planning, GA27-2878*.

Bulk Loop Cable Description	Part No.	Purchase
#22 AWG Internal .64mm diameter	1657265	
#22 AWG External Above Ground .64mm diameter	1657267	
#22 AWG External Under Ground .64mm diameter	1657268	

Ordering Instructions: Interior cable (P/N 1657265) should be ordered in 1000 feet (30,000 cm) rolls in one continuous length. Additional footage greater than a roll(s) length can be ordered by specifying the number of feet wanted (up to 999). A minimum order quantity is one roll (1000 feet).

Exterior cable (P/N 1657267 and 1657268) can be ordered by specifying the length up to a maximum of 3000 feet (90,000 cm) in one continuous length. Outdoor splices with aerial and burial cable should be avoided by ordering one continuous length.

Warranty: Loop Cable is warranted free from defects of workmanship and materials for 90 days.

Loop Accessories (3630, 8100)

A group of accessory products are offered to permit plant electricians or contract personnel to install the loops.

Loop Splice Plate (LSP) – The LSP splices together two segments of indoor cable or provides a connecting point for future expansion of the loop. The LSP consists of a single connector strip, to which the incoming loop cable and the outgoing loop cable can be attached; it is installed in a standard outlet box for business office environments, or weatherproof outlet box for industrial environments.

Loop Station Connector (LSC) – The LSC is available as two unique types: wrap and radial. The wrap LSC attaches an I/O unit or controller directly to the main loop cable; the radial LSC attaches an I/O unit only through an LWC to the loop. The wrap LSC attaches an incoming and outgoing loop cable; the radial LSC attaches at the end of one loop cable from the LWC.

The wrap LSC also offers the isolation feature of wrapping which allows the customer to wrap the loop away from a loop wiring failure or to reconfigure the loop during alterations. Both wrap and radial LSCs contain bypass relays that bypass the I/O unit when the I/O unit is powered-off or disconnected. These accessories are installed in a standard or weatherproof outlet box.

Loop Wiring Concentrator (LWC) – The LWC provides the facility to attach a cluster of I/O units without a large number of drops on the loop cable. It attaches up to eight radial LSCs at the end of loop cables called *radials*. The point where a radial line terminates at the LWC is called an *LWC Port*. Not all ports have to be used; unused ports can be reserved for future expansion.

The LWC has the same wrapping capability as the wrap LSC. In addition, the LWC allows the customer to bypass one or more of the radials by setting a corresponding switch located inside the LWC.

The LWC has its own enclosure or can be mounted in a NEMA-4X electrical equipment cabinet, with minimum measurement of 36x30x15 cm (14x12x6 in.).

Loop Surge Suppressor (LSS) – The LSS allows the loop to be run across an outdoor space to another building. It attaches two outdoor cables and two indoor cables, allowing the proper termination and grounding for each type of cable. In addition, the LSS contains four surge protectors, one for each twisted pair in the two outdoor cables, to protect from voltage surges caused by near strikes of lightning. There is no protection in the LSS from a direct lightning strike.

The LSS has its own enclosure or can be mounted in an electrical equipment cabinet, with minimum measurement of 36x30x15 cm (14x12x6 in.).

Continuity and Relay Tester – The Continuity and Relay Tester is used with a volt-ohm meter to verify the loop installation, including loop cabling and accessories, after completion. By plugging the tester into any loop station connector and connecting any volt-ohm meter rated at least 5000 ohms/volt to the tester, the condition of the wire segment being tested can be determined as to conductor and shield continuity (opens or shorts), wrap switch operation, and total lobe resistance. The loop station connector relays are also activated and their operation verified with this tester.

Loop Accessories	Part No.	Purchase
Loop Splice Plate (LSP)	1657300	\$6.00
Loop Station Connector (Radial LSC)	1657310	40.00
Loop Station Connector (Wrap LSC)	1657320	70.00
Loop Wiring Concentrator (LWC)	1657330	160.00
LWC Circuit Board Assy (order instead of LWC - 1657330)*	1657332	145.00
Loop Surge Suppressor (LSS)	1657350	220.00
LSS Circuit Board Assy (order instead of LSS - 1657350)*	1657354	200.00
Continuity and Relay Tester	1657420	140.00
Loop Accessory Keys (10 spares) **	1657379	4.00
Wrap Switch Access Cover	1657325	5.00
Electrical Box (indoor) 5cm x 10cm (1 in. x 4 in.)	2102151	1.20
Clamp (for cable to indoor box)	2100264	.10
Electrical Box (outdoor) 7cm x 11.5cm (2.75 in. x 4.5 in.)(for industrial use)	1657280	7.00
Clamp-small (for cable to indoor box)	2114285	5.00
Clamp-large (for cable to outdoor box)	1657377	5.00
Single Device Attachment Cable... 40 ft (12.1m) (8100 system only)	8269543	152.00

* For use with NEMA -4X enclosure and associated parts (used when installing in harsh environments) or as a replacement part for the LWC or LSS.

** 1 package (10 keys) shipped with each 3631, 3632, 3842, 8101, 8130 or 8140. 1 key shipped with each LWC and wrap LSC.

Ordering Instructions –

When ordering use Machine Type 3631, 3632, 8101, 8130 or 8140.

ACCESSORIES

3630 SYSTEM ACCESSORIES ... cont'd

Warranty – All loop accessories are warranted free from defects of workmanship and materials for 90 days.

Customer Responsibilities

The customer is responsible to provide (purchase, install, test, and maintain) the loop cables and accessories for terminal attachments.

The customer is also responsible for procuring and stocking spare cable and spare parts for loop accessories.

See *IBM 3630 System Loop Installation Manual - Physical Planning*, GA24-3675 or *IBM 8100 Information System Loop Installation*, GA27-2879, for a suggested schedule to allow the customer to plan, install, and test the loop cable and accessories prior to delivery of the system.

It is recommended that the customer order additional loop components for spares with the initial order, as spares will not be stocked in the Branch Office.

To enable the customer to test installed loops it is recommended that the customer order a Continuity and Relay Tester or its equivalent. Testing the loop wiring will require the tester or its equivalent.

Wall Mounting Brackets [3641, 3646]

A two piece mounting bracket is available to mount the 3641 or 3646 to a wall, column, or other vertical surface. One piece mounts on the 3641 or 3646 and the other mounts on the vertical surface. There are four bracket holes on the back of the 3641 or 3646 and four mounting screws supplied with the brackets. The customer is responsible for supplying the fasteners for the wall bracket.

Description	Part NO.	Purchase
Wall Mounting Bracket	4151768	\$ 35

Ordering Instructions – For ordering for delivery with the machine see appropriate machine page.

use Machine Type 3641 or 3646.

When ordering,

Warranty – Wall mounting brackets are warranted free from defects of workmanship and materials for 90 days.

Magnetic Scanner Accessories

Magnetic Hand Scanner [3278, 3641, 3643, 3646, 3647]

The Magnetic Hand Scanner (MHS) attaches by a 1.5 meter coiled cable to a number of data entry and reporting devices that have an appropriate magnetic adapter feature. It allows the user to read magnetic stripe labels that are attached to shelves, cartons, machines, etc. It can also be used to read magnetic stripe tags which are hand-held or placed on a flat surface.

The MHS has three lights and an audible buzzer which provide feedback to the user on the status of the scanned data. With proper encoding the MHS can read a stripe in either direction. A magnetic reader attachment feature on the appropriate machine is required to use the Magnetic Hand Scanner.

Magnetic Slot Reader and Dual Entry Magnetic Slot Reader [3276, 3278, 3651, 3643, 3646, 3647, 8775]

The Magnetic Slot Reader (MSR) and Dual Entry Magnetic Slot Reader (DEMSR) attach by a 1.5 meter cable to a number of data entry and reporting devices that have an appropriate magnetic adapter feature. These slot readers accommodate a wide range (height and length) of magnetic striped card stock and plastic badges including: magnetic striped 80-column cards, operator identification badges, large and small credit cards, etc.

The MSR and DEMSR have three lights and an audible buzzer which provide feedback to the user on the status of scanned data. Holes in the bottom of the readers allow optional attachment to an appropriate flat surface.

The MSR has a wide opening on one end to facilitate reading of badges and documents. The DEMSR has wide openings on both ends to facilitate reading in either direction. A magnetic reader attachment feature on the appropriate machine is required to use the MSR or DEMSR.

Description	Part No.	Purchase	Maintenance
Magnetic Hand Scanner	4123495	\$ 275	T&M
Magnetic Slot Reader	4123500	275	T&M
Dual Entry Magnetic Slot Reader	4123520	285	T&M

Ordering Instructions – For ordering for delivery with the machine, see appropriate machine page.

use Machine Type 3276, 3278, 3641, 3643, 3646, 3647, 8775.

When ordering

Maintenance – High-densities of hard particulates may decrease head life. In this environment, customer should consider protecting the media to reduce the frequency of head assembly replacement. Where there are high densities of corrosive gases, more frequent head assembly replacement may be required.

Warranty – The Magnetic Hand Scanner, the Magnetic Slot Reader and the Dual Entry Magnetic Slot reader are warranted to be free from defects in workmanship and materials for a period of 90 days. Warranty service will be performed at the FE Repair Center. The customer will fill out a Repair Center Machine Repair Authorization Form (GX27-2981), pack, and mail it and the defective Magnetic Hand Scanner or Magnetic Slot Reader to:

IBM Corporation
 Repair Center
 321 Route 17
 Paramus, N. J. 07652

There is no regularly scheduled preventive maintenance recommended by IBM. Primary maintenance for the MHS, MSR and/or DEMSR will be done by the customer, following the problem determination and part replacement procedures.

Optionally, the customer can obtain post-warranty maintenance on a Time and Materials basis at the IBM Repair Center, Paramus, N. J.

ACCESSORIES

3630 SYSTEM ACCESSORIES ... cont'd

Magnetic Hand Scanner or Slot Reader Replacement Assemblies

Description	Part No.	Purchase
MHS Sensor Head Assembly	4832721	\$ 75
MHS Handle and Feedback Assembly	4832701	84
MHS Amplifier Card and Cable Assembly	4832727	116
DEMSR/MSR Arm and Sensor Head Assembly	4832963	72
MSR Base and Feedback Assembly	4832973	82
DEMSR/MSR Amplifier Card and Cable Assembly	4832962	114
MSR Cover	4832964	7
DEMSR Base and Feedback Assembly	4123518	82
DEMSR Cover	4123486	17

The following table lists a number of magnetic replacement assemblies the customer may want to consider stocking.

Magnetic Hand Scanner

No. of MHS	Sensor Head Assy P/N 4832721	Handle and Feedback Assy P/N 4832701	Amplifier Card and Cord Assy P/N 4832727
P/N 4123495			
50	2	1	2
100	3	1	3
150	4	1	4
200	5	2	5

Magnetic Slot Reader

No. of MSR	Arm & Sensor Head Assy P/N 4832963	Base and Feedback Assy P/N 4832973	Amplifier Card and Cord Assy P/N 4832962	Cover P/N 4832964
P/N 4123500				
50	2	1	2	1
100	3	1	3	1
150	4	1	4	1
200	5	2	5	1

Dual Entry Magnetic Slot Reader

No. of DEMSR	Arm & Sensor Head Assy P/N 4823963	Base and Feedback Assy P/N 4123518	Amplifier Card and Cord Assy P/N 4832962	Cover P/N 4123486
P/N 4123520				
50	2	1	2	1
100	3	1	3	1
150	4	1	4	1
200	5	2	5	1

Warranty – Magnetic scanner replacement assemblies are warranted free from defects of workmanship or materials for 90 days.

Magnetic Slot Reader Mounting Bracket [3647]

The mounting bracket is used to firmly attach the MSR or DEMSR to the 3647. It locks to the front cover of the 3647 by a key lock. The magnetic reader cable is coiled under the bracket.

Description	Part No.	Purchase
Magnetic Slot Reader Mounting Bracket	8632451	\$ 25

Ordering Instructions – For ordering for delivery with the machine see appropriate machine page. When ordering use Machine Type 3647.

Magnetic Reader Extension Cables [3641, 3643, 3646]

These cable assemblies can be used to extend the Magnetic Hand Scanner (P/N 4123495) or Magnetic Slot Reader (P/N 4123500) distances. **Limitation;** Extension cables cannot be plugged into other extension cables.

Description	Part No.	Purchase
6 meter (19.7 ft.)	4832986	\$ 30
12 meter (39.4 ft.)	4832987	43

Note: Different length cables are available

Ordering Instructions – For ordering for delivery with the machine see appropriate machine page. When ordering, use Machine Type 3641, 3643 or 3646.

Warranty – Magnetic reader extension cables are warranted free from defects of workmanship or materials for 90 days.

3644 AUTOMATIC DATA UNIT ACCESSORIES

3644 Sensor I/O Cards

16 point Non-isolated DI – Provides 16 non-isolated input points for connection to user voltage or contact sense signals. Each point provides a high level and a low level sense capability. Input parameters are:

Contact Sense	Low Level	High Level
Logical 1	≤ 2K OHMS	≤ 5K OHMS
Logical 0	≥ 50K OHMS	≥ 100K OHMS
Voltage Sense	Low Level	High Level
Logical 1	- 24.0 to + 1.0 VDC	0 to + 9.0 VDC
Logical 0	+ 2.5 to + 24.0 VDC	+ 22.5 to + 52.8 VDC

ACCESSORIES

3630 SYSTEM ACCESSORIES ... cont'd

16 Point Isolated DI – Provides 16 points of optically isolated digital input for connection to user signals. 250 VDC isolation is provided between user signals and the 3644. Each point provides a high level and a low level voltage - sense capability. Input parameters are:

	Low Level	High Level
Logical 1	+ 2.0 to + 12.0 VDC	+ 12.0 to + 52.8 VDC
Logical 0	- 12.0 to + 0.8 VDC	- 52.8 to + 0.8 VDC

16 Point Non-isolated DO – Provides 16 NPN transistor switches in a grounded emitter configuration for switching user provided DC power to user provided devices. Each switch is capable of sinking .250 amps from a 52.8 volt source through a resistive load. A logical 1 written into the control register will cause the transistor to turn on. Maximum voltage drop in the on state is 0.4 volts at load currents up to 20 milliamperes and 0.6 volts at load currents up to .250 amps. If no user voltage source is attached, the card will supply an off state voltage of 5.5 volts maximum at 0 amps, and 2.4 volts minimum at .001 amps.

16 Point Isolated DO – Provides 16 NPN transistor switches in an open collector, open emitter configuration for switching user provided DC power to user provided devices. 250V DC or peak AC isolation is provided between each switch and the 3644. Each transistor switch is capable of switching up to .250 amps from a 52.8 volt source to a resistive load. A logical one written into the control register will cause the switch to turn on. Maximum voltage drop in the on state is 0.4 volts at load currents up to 20 milliamps and 0.6 volts at load currents up to 250 milliamps.

Analog/Digital Converter – Provides an 11 bit plus sign (12 bit total), 5 volt bi-polar, successive approximation analog to digital converter with a zero correction logic section that reduces errors caused by component aging and temperature induced offset drift. Note that the ADC must be used in conjunction with at least one multiplexor card to provide for connection of signal wires. Additional multiplexor cards may be installed to provide a greater multiplexing capability. The ADC card must be installed in the 3644 card socket 1 if it is used. The first multiplexor card must be installed in socket 2.

8 Point Reed Relay Multiplexor – Provides eight 3-wire connections for shielded differential analog input signals. Provides eight-way multiplexing for the ADC. Flying capacitor switching is used to provide + or - 200 volt common mode tolerance and reduce the influence of common mode voltage to unmeasurable levels at reference conditions. The reed relay multiplexor can switch signal voltages ranging from -0.5 to +5 volts.

Current Loop Receiver/Transmitter – Provides two transmitters and two receivers for modulating and demodulating a 20 milliamp current flow. Switches are provided on the card to select speed (110, 150, 300, 600, 1200 baud), number of data bits (5, 6, 7, 8), parity (odd, even, none), and number of stop bits (1, 2). A variety of start/stop codes over a wide range of speeds is available to allow connection to bit-serial devices. If more than two current loop cards are to be used in a single 3644 consult the 3644 Component Description Manual.

Description	Part No.	Purchase
16 Point Non-isolated DI	4152582	\$450
16 Point Isolated DI	4152581	655
16 Point Non-isolated DO	4152583	372
16 Point Isolated DO	8333198	575
Analog/Digital Converter	4152586	900
8 Point Reed Relay Multiplexor	4152584	682
Current Loop Receiver/Transmitter	4152580	725

Ordering Instructions – For ordering for delivery with machine see appropriate machine page. When ordering use Machine Type 3644.

Warranty – Each 3644 Sensor I/O card is warranted to be free from defects in materials and workmanship for a period of 90 days starting either on the date of installation or 30 days after date of shipment, whichever comes first. IBM at its option will repair or replace the defective or failing accessory. Warranty service will be performed at the FE Repair Center. The customer is responsible for executing the problem determination procedures for the Sensor I/O cards, determining the defective card and mailing it to:

IBM Corporation
Repair Center
321 Route 17
Paramus, N. J. 07652

Cards that have been modified and cards that have been damaged through improper installation, handling, or failure to provide a suitable installation environment will not be accepted for warranty service. IBM shall be the sole judge of whether or not a card meets warranty requirements.

Spare unit requirements are a function of the customer's application, the total number of 3644s installed, and the range of Sensor I/O card types installed. Spare unit stocking considerations are:

1. At least one spare for each type of Sensor I/O card installed at a customer site.
2. Where multiples of a single Sensor I/O card are installed, one spare for each eight active cards.

Each customer will have to determine his own unique spare requirements.

3644 ATTACHMENT ACCESSORIES

Process Termination Block – Attaches to the end of the Sensor I/O card to provide a screw-down termination facility for process signals and to retain the card in the 3644 housing. Each installed card with the exception of the analog-digital converter must be equipped with a process termination block.

Accessory Socket Cover – Covers unused sensor card locations in the 3644 to minimize entry of airborne contaminants. One cover is required for each unused sensor card location. A cover is also used to retain the A/D Converter.

Description	Part No.	Purchase
Process Termination Block	4152588	\$ 70
Accessory Socket Cover	4152589	20

Ordering Instructions – For ordering for delivery with machine, see appropriate machine page. When ordering, use machine Type 3644.

Warranty – The 3644 Attachment Accessories are warranted free from defects in workmanship and materials for 90 days.



ACCESSORIES

**3653, 3683, 3684
CASH TILL and
COVER WITH LOCK**

Additional cash tills and till covers may be ordered

Note: Assembly of the Adjustable Till is a customer responsibility.

For 3653, 3683, 3684 —

	Purchase	MMMC	FIC
Cash Till w Fixed Bill Dividers, Part No. 1860154, each (w/o cover)	\$ 15.00	NC	NC
Cash Till w Adjustable Bill Dividers, Part No. 2493151, each (w/o cover)	15.00	NC	NC
Cash Till Cover with lock and keys, Part No. 1851126, each	7.50	NC	NC

**3657 Ticket Unit
HOPPER/STACKER
CARTRIDGE**

The 3657 is shipped with two Hopper/Stacker cartridges. Additional or replacement cartridges may be purchased.

	Purchase
Hopper/Stacker Cartridge, Part No. 5560620, each	\$ 17.00

3663 TILLS

The 3663 Supermarket Terminal stations are equipped with a removable till and locking cover. Additional tills and locking covers may be ordered

Specify Part No. and quantity. **Note:** Assembly of the Adjustable Till is a customer responsibility.

	Purchase	MMMC	FIC
3663 Till with Fixed Bill Slots, Part No. 1851117	\$ 21.00	NC	NC
3663 Till with Adjustable Bill Slots, Part No. 1990616	21.00	NC	NC

3666 WINDOW

The 3666 Checkout Scanner is equipped with a replaceable window. With use, it will tend to get scratched and need to be replaced periodically. Additional windows may be ordered

Specify Part No. and quantity.

3666 Window, Part No. 5563123	\$ 3.00	NC	NC
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3863/3864/3865 MODEM ACCESSORIES

**RACK MOUNT
ADAPTER**

A rack adapter that fastens inside a standard 19" EIA rack. A shelf with an inside width of 17-3/8" (441.3mm) which allows two standalone modems to be placed side by side. The adapter will fit racks with depths of 23.5" to 30" (600 to 760mm).

Purchase MMMC

Rack Mount Adapter, Feature No. 6420	\$ 70	NC
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**TAIL CIRCUIT
ATTACHMENT**

*Allows the 3863 mdl 1 or 3864 mdl 1 to attach to a 3865 Modem mdl 1 (9600 bps) equipped with Data Multiplexing (#3260). Permits an extension of a network via a separate set of modems and a separate communications channel. **Limitations:** No LPDA support on tailed circuit attachments ... 3863 mdl 1s or 3864 mdl 1s in point-to-point or multipoint control mode only.*

Tail Circuit Attachment, Feature No. 7875	\$ 45	NC
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ACCESSORIES

3653/3663/3683/3684 Terminal

KEYBOARD ACCESSORIES

The following terms are used in the keypad descriptions.

VERSION STEM NUMBER/KEY ALIGNMENT

OV	One/Vertical
OH	One/Horizontal
OVH	One/Vertical or Horizontal
TV	Two/Vertical
TH	Two/Horizontal
-B	Small raised projection in keypad
-C	Circular, concave top on key button
-M	Minimal concavity of circular keypad

SIZE UNITS

Single	1 x 1
Single	1 x 1-1/3
Long	1 x 2
Double	1-1/3 x 2

ENGRAVED KEYTOPS Keytops containing pre-defined messages are available for use on the 3653/3663/3683/3684 terminal keyboards. Blank keytops are also available for customer engraving. Keytops can be ordered by part number

Specify part number and quantity.

3650/3680 RETAIL KEYTOPS

The following is a list of pre-defined keytops available in the 3650 Retail Store System nomenclature:

Purchase

3653/3663/3683/3684 Keypad, ea \$.40

NAME	COLOR	SIZE	VERSION	HEIGHT	PART NO.
2	White	Square	OH	Std	1650743
3	White	Square	OH	Std	1650744
4	White	Square	OH	Std	1650745
5	White	Square	OH-B	Std	1650746
7	White	Square	OH	Std	1650748
1 CASH	White	Square	OH	Std	1757346
2	White	Square	OH	Std	1757347
3 CASH S'CHK	White	Square	OH	Std	1757348
4 COD	White	Square	OH	Std	1757351
5 LAYBY	White	Square	OH-B	Std	1757352
6 CHRGE	White	Square	OH	Std	1757353
7 DEFER CHRGE	White	Square	OH	Std	1757354
8 INVCE WELFR	White	Square	OH	Std	1757355
9	White	Square	OH	Std	1757356
7G	White	Square	OH	Std	1762440
8H	White	Square	OH	Std	1762441
9J	White	Square	OH	Std	1762442
1 A CASH	White	Square	OH	Std	1762834
2 B CHECK	White	Square	OH	Std	1762835
3 C CHG	White	Square	OH	Std	1762836
4 D	White	Square	OH	Std	1762837
5 E	White	Square	OH-B	Std	1762838
6 F	White	Square	OH	Std	1762839
/	White	Square	OH	Std	1853929
1 CASH	White	Square	OH	Std	1853931
2 SPLC	White	Square	OH	Std	1853932
3 S'CHK	White	Square	OH	Std	1853933
4 COD	White	Square	OH	Std	1853934
5 L'WAY	White	Square	OH-B	Std	1853935
6 CHG A	White	Square	OH	Std	1853936
7 CHG B	White	Square	OH	Std	1853937
8 CHG C	White	Square	OH	Std	1853938
9 CHG D	White	Square	OH	Std	1853939
6 CHG	White	Square	OH	Std	1855411
7 TMP	White	Square	OH	Std	1855412
8	White	Square	OH	Std	1855413
9	White	Square	OH	Std	1855414
8 CTA	White	Square	OH	Std	5192991
9 STORE	White	Square	OH	Std	5192992
6 REG	White	Square	OH	Std	1757364
7 PBA	White	Square	OH	Std	1757365
8 CCA	White	Square	OH	Std	1757366
9 CLUB	White	Square	OH	Std	1757367
NON-TAX	Yellow	Single	OH	Std	1650749
RETURN CREDIT	Yellow	Single	OH	Std	1650750
FRACT QTY	White	Single	OH	Std	1752442
NON MDSE CODE	Yellow	Single	OH	Std	1757342
EMPLOYEE DISCOUNT	Yellow	Single	OH	Std	1757343
RETURN	White	Single	OH	Std	1757344
MISC TAX CODE	Yellow	Single	OH	Std	1757349
ALLOW/MISC CREDIT	Yellow	Single	OH	Std	1757350
DEPOSIT	Yellow	Single	OH	Std	1757357

NAME	COLOR	SIZE	VERSION	HEIGHT	PART NO.
SKU	Blue	Single	OH	Std	1762444
DATA ENTRY	Blue	Single	OH	Std	1853915
NON MDSE CODE	Blue	Single	OH	Std	1853916
RETURN CREDIT	Blue	Single	OH	Std	1853917
PAYMENT	Blue	Single	OH	Std	1853918
ALLOW CODE	Blue	Single	OH	Std	1853919
DEPT	Blue	Single	OH	Std	1853920
CLASS	Blue	Single	OH	Std	1853921
NON TAX	Blue	Single	OH	Std	1853922
STOCK	Blue	Single	OH	Std	1853923
QTY	Blue	Single	OH	Std	1853924
SUB TOTAL	Blue	Single	OH	Std	1853925
DISCOUNT CODE	Blue	Single	OH	Std	1853926
TAX CODE	Blue	Single	OH	Std	1853927
SUB	White	Single	OH	Std	1855409
LOT	White	Single	OH	Std	1855410
ITEM	Blue	Single	OH	Std	5192903
COUPON DISPLAY	Blue	Single	OH	Std	5192987
NO COUPON	Blue	Single	OH	Std	5192988
VOID	White	Single	OH	Std	5587654
DISCOUNT CODE	Red	Single	OH	Std	5587655
Dept	Brown	Single	OH	R-1/8	5587658
CLASS	Brown	Single	OH	R-1/8	5587663
RETURN CREDIT	Red	Single	OH	Std	5587664
STOCK	Brown	Single	OH	R-1/8	5587667
ALLOW CODE	Red	Single	OH	Std	5587668
R/P/M	Blue	Single	OH	Std	1757074
C/U	Blue	Single	OH	Std	1757075
D	Blue	Single	OH	Std	1757076
0	White	Long	OV	Std	1762443
CLEAR	White	Long	OH	Std	1762910
0	White	Long	OV	Std	1762911
VOID	Red	Long	OV	Std	1762913
0 COUPON NO SALE	White	Long	OV	Std	5192990
0 NO SALE	White	Long	TH	Std	5587674
ENTER	White	Double	TV	R-1/8	1762530
TOTAL	White	Double	TV	R-1/8	1762531
CLEAR	White	Double	TV	R-1/8	1762532
TOTAL	Blue	Double	OV	Std	1853906
MODIFY TICKET	Blue	Double	OV	Std	1853907
ENTER	Blue	Double	OV	Std	1853908
ENTER COUPON	Blue	Double	OV	Std	5192989
QTY	Blue	Double	TV	Std	5588042
MODIFY TICKET	Blue	Double	TV	Std	5588043
MODIFY TICKET CASH	Blue	Double	TV	Std	5588047
SKIP FIELD	Blue	Double	OV	Std	1757077

ACCESSORIES
3653/3663/3683/3684 Terminal Keyboard Accessories (cont'd)
3663/3683/3684 SUPERMARKET KEYTOPS

The following is a list of pre-defined keytops available in the 3663/3683/3684 Supermarket nomenclature:

		Purchase			
		3663/3683/3684 Keytop, each \$.40			
NAME	COLOR	SIZE	VERSION	HEIGHT	PART NO.
FOR	White	Square	OH-CM	Std	1650263
5	White	Square	OH-BC	Std	1752490
4	White	Square	OH-C	Std	1854186
5	White	Square	OH-C	Std	1854187
6	White	Square	OH-C	Std	1854188
*	White	Square	OH-CM	Std	1854189
1	White	Square	OH-CM	Std	1854190
2	White	Square	OH-CM	Std	1854191
3	White	Square	OH-CM	Std	1854192
7	White	Square	OH-CM	Std	1854193
8	White	Square	OH-CM	Std	1854194
9	White	Square	OH-CM	Std	1854195
NO SALE	White	Single	OH	Std	1762460
VOID	Red	Single	OH	Std	1762462
DISC	Red	Single	OH	Std	1762463
REFUND	Red	Single	OH	Std	1762464
MFR COUPON N	Red	Single	OH	Std	1762465
STORE COUPON M	Red	Single	OH	Std	1762466
FOOD STAMP E	Blue	Single	OH	R-1/8	1762472
CHECK FEE	Blue	Single	OH	R-1/8	1762473
BOTTLE DEPOSIT	Blue	Single	OH	R-1/8	1762474
PRICE B(PSWD)	Blue	Single	OH	R-1/8	1762475
TAX/NO TAX	Blue	Single	OH	R-1/8	1762476
WEIGHT A(OP#)	Blue	Single	OH	R-1/8	1762478
QTY C	Blue	Single	OH	R-1/8	1762479
MEAT	Red	Single	OH	R-1/8	1762480
BOTTLE REFUND	Red	Single	OH	R-1/8	1762481
WINE	Red	Single	OH	R-1/8	1762482
PROD	Green	Single	OH	R-1/8	1762484
FLWR	Green	Single	OH	R-1/8	1762485
GEN MDSE	Green	Single	OH	R-1/8	1762487
FROZ FOOD	Green	Single	OH	R-1/8	1762488
DELI	Yellow	Single	OH	R-1/8	1762489
CH'ESE	Yellow	Single	OH	R-1/8	1762490
BEER	Yellow	Single	OH	R-1/8	1762492
LIQUOR	Brown	Single	OH	R-1/8	1762493
TOBAC	Brown	Single	OH	R-1/8	1762494
NON FOOD	Brown	Single	OH	R-1/8	1762495
SNDRY	Brown	Single	OH	R-1/8	1762496
GROC	White	Single	OH	R-1/8	1762497
GROC TAX	White	Single	OH	R-1/8	1762498
GROC NON TAX	White	Single	OH	R-1/8	1762499
FISH	White	Single	OH	R-1/8	1762502
BAKE	White	Single	OH	R-1/8	1762503
HABA	White	Single	OH	R-1/8	1762504
DAIRY	White	Single	OH	R-1/8	1762505
MFG COUPON N	Blue	Single	OH	Std	1854196
MISC N	Blue	Single	OH	Std	1854197
STORE COUPON M	Blue	Single	OH	Std	1854198
PRICE B(PSWD)	Blue	Single	OH	Std	1854199
WEIGHT A(OP#)	Blue	Single	OH	Std	1854200
QTY C	Blue	Single	OH	Std	1854201
REFUND D	Blue	Single	OH	Std	1854202
VOID J	Blue	Single	OH	Std	1854203
SIGN ON/OFF	Blue	Single	OH	Std	1854204
FOOD STAMP E	Blue	Single	OH	Std	1854205
DISC K	Blue	Single	OH	Std	1854206
CHECK F	Blue	Single	OH	Std	1854207
CHECK VERIFY I	Blue	Single	OH	Std	1854208
CASH G	Blue	Single	OH	Std	1854209
NO SALE	Blue	Single	OH	Std	1854210
STAMP-	Blue	Single	OH	Std	1854211
TAX/NO TAX	Blue	Single	OV	Std	1854212
GROC	Blue	Single	OV	Std	1854213
PROD	Green	Single	OV	Std	1854215
DEPT 1	Blue	Single	OV	Std	1855373
DEPT 2	Blue	Single	OV	Std	1855374
DEPT 3	Blue	Single	OV	Std	1855375
DEPT 4	Blue	Single	OV	Std	1855376
BAKE	Blue	Single	OH	Std	1855377
DELI	Blue	Single	OH	Std	1855378
DAIRY	Blue	Single	OH	Std	1855379
FROZ FOOD	Blue	Single	OH	Std	1855380
LIQUOR	Blue	Single	OH	Std	1855381
WINE	Blue	Single	OV	Std	1855382
HABA	Blue	Single	OV	Std	1855383
TOBAC	Blue	Single	OV	Std	1855384
GEN MDSE	Blue	Single	OV	Std	1855385
CHECK FEE	Blue	Single	OV	Std	1855386
FISH	Blue	Single	OV	Std	1855387

NAME	COLOR	SIZE	VERSION	HEIGHT	PART NO.
FLWR	Blue	Single	OV	Std	1855388
SNDRY	Blue	Single	OV	Std	1855389
CH'ESE	Blue	Single	OV	Std	1855390
NON FOOD	Blue	Single	OV	Std	1855391
BEER	Blue	Single	OV	Std	1855392
ALTER ENTRY	Blue	Single	OH	Std	5183540
FS/NO FS	Yellow	Single	OH	Std	5194241
SERV-DELI	Blue	Single	OV	Std	8542914
DRUG TAX	Blue	Single	OV	Std	8542915
SEAFOOD	Blue	Single	OV	Std	8542916
TARE OVERRIDE	Blue	Single	OH	Std	8542917
MEAT	Red	Single	OV	Std	1854219
0	White	Long	TH	Std	1648416
0	White	Long	OV	Std	1854214
ENTER	White	Double	TV	Std	1762520
TOTAL	White	Double	TV	Std	1762521
GROC	White	Double	TV	R-1/8	1762529
ENTER	White	Double	TV	R-1/8	1762530
TOTAL	White	Double	TV	R-1/8	1762531
CLEAR	White	Double	TV	R-1/8	1762532
CLEAR	White	Double	OV	Std	1854216
TOTAL	White	Double	OV	Std	1854217
ENTER	White	Double	OV	Std	1854218

ACCESSORIES

3653/3663/3683/3684 Terminal Keyboard Accessories (cont'd)

3653/3663/3683/3684 BLANK KEYTOPS

The following is a list of blank keytops which are available for customer engraving:

Keytop, each	Purchase				
	COLOR	SIZE	VERSION	HEIGHT	PART NO.
	White	Square	OH-CM	R-1/8	1648413
	White	Square	OH-CB	Std	1752491
	White	Square	OH	Std	1853928
	White	Square	OH-B	Std	1853930
	White	Square	OH-CM	Std	1854184
	White	Square	OH-C	Std	1854185
	White	Single	OVH	Std	1762468
	Yellow	Single	OVH	Std	1762469
	Black	Single	OVH	Std	1762470
	Brown	Single	OVH	Std	1762471
	White	Single	OH	R-1/8	1762506
	Red	Single	OH	R-1/8	1762507
	Blue	Single	OH	R-1/8	1762508
	Green	Single	OH	R-1/8	1762509
	Yellow	Single	OH	R-1/8	1762510
	Black	Single	OH	R-1/8	1762511
	Brown	Single	OH	R-1/8	1762512
	White	Single	OH	R-1/4	1762513
	Red	Single	OH	R-1/4	1762514
	Blue	Single	OH	R-1/4	1762515
	Green	Single	OH	R-1/4	1762516
	Yellow	Single	OH	R-1/4	1762517
	Black	Single	OH	R-1/4	1762518
	Brown	Single	OH	R-1/4	1762519
	Blue	Single	OVH	Std	1853914
	Green	Single	OVH	Std	1854182
	Red	Single	OVH	Std	1854183
	White	Long	TH	R-1/8	1648415
	White	Long	TH	Std	1648417
	White	Long	OV	Std	1853909
	White	Long	OH	Std	1855439
	Red	Double	TV	R-1/4	1648405
	Blue	Double	TV	R-1/4	1648406
	Green	Double	TV	R-1/4	1648407
	Yellow	Double	TV	R-1/4	1648408
	Black	Double	TV	R-1/4	1648409
	Brown	Double	TV	R-1/4	1648410
	White	Double	TV	Std	1762522
	Red	Double	TV	Std	1762523
	Blue	Double	TV	Std	1762524
	Green	Double	TV	Std	1762525
	Yellow	Double	TV	Std	1762526
	Black	Double	TV	Std	1762527
	Brown	Double	TV	Std	1762528
	White	Double	TV	R-1/8	1762533
	Red	Double	TV	R-1/8	1762534
	Blue	Double	TV	R-1/8	1762535
	Green	Double	TV	R-1/8	1762536
	Yellow	Double	TV	R-1/8	1762537
	Black	Double	TV	R-1/8	1762538
	Brown	Double	TV	R-1/8	1762539
	White	Double	TV	R-1/4	1762540
	Blue	Double	OV	Std	1853905
	White	Double	OV	Std	1854181

UNIVERSAL KEYTOPS

Keyboard accessories are available which allow the customer to define and to change the messages on the keytops on the 3653, 3663, 3683 and 3684 terminals. These accessories consist of legendable keytops and sheets of blank labels to use on these keytops.

The universal keytops come in the four standard sizes and in two heights. They consist of two parts; a white bottom button and a clear plastic cover. Blank labels for the various keytop sizes may also be ordered. These labels come in various colors and may be printed with either black or white ink. The user may define unique key button messages, print these messages on the desired color label, affix the printed color label to the white bottom key button and snap on the clear protective cover. Extra clear plastic covers are also available for use as spares.

Accessories can be ordered by part number
Specify part number and quantity.

	Purchase
Keytop, each	\$.40
Plastic Cover, each	\$.15
Label Sheet, each	\$.20

ITEM	COLOR	SIZE	HEIGHT	VERSION	PART NO.
Keytop	White	Square	Std	OH	5188767
Keytop	White	Single	Std	OVH	5188768
Keytop	White	Single	R-1/8	OH	5188769
Keytop	White	Long	Std	TH	5188770
Keytop	White	Long	Std	OV	5188771
Keytop	White	Long	Std	OH	5188772
Keytop	White	Double	Std	OV	5188773
Keytop	White	Double	Std	TV	5188774
Cover	Clear	Square	--	--	5188751
Cover	Clear	Single	--	--	5188754
Cover	Clear	Long	--	--	5188757
Cover	Clear	Double	--	--	5188760

ITEM	COLOR	SIZE (Decals/Sheets)	PART NO.
Labels	White	Square (102 decals/sheet)	5194900
Labels	White	Single (68 decals/sheet)	1756848
Labels	Yellow	Single (68 decals/sheet)	5194901
Labels	Red	Single (68 decals/sheet)	5194902
Labels	Blue	Single (68 decals/sheet)	5194903
Labels	Green	Single (68 decals/sheet)	5194904
Labels	Brown	Single (68 decals/sheet)	5194905
Labels	White	Long (42 decals/sheet)	5194906
Labels	White	Double (28 decals/sheet)	5194907
Labels	Red	Double (28 decals/sheet)	5194908
Labels	Blue	Double (28 decals/sheet)	5194909

KEY STOPS

The key stop is a small ring collar which is placed over the stem of a keybutton and under the keytop. The collar holds the keytop in the up position and prevents its use. These stops may be ordered by part number.

Specify part number and quantity.

	Part No.	Purchase
Key Stop, each	1650058	\$.20

KEYTOP EXTRACTOR

The keytop extractor is a small plier-like device which fits between rows of keybuttons. By squeezing on the handles, a firm grip is made on the keytop and it may be pulled off its stem. The customer may find this helpful when adding key stops, universal keytops, or in doing any rearranging of the keyboard.

Two keytop extractors are supplied with each 3651 controller and one extractor with each 3684 Point of Sale - Control Unit. The customer may desire additional extractors. They may be ordered by part number 1647720



ACCESSORIES

3736 ACCESSORIES For shipment with machine, order the feature number indicated.

MRC Purchase MMMC

Paper Stacker/Tray: Holds fan-fold continuous form paper and stacks paper as it leaves the 3736 printer.

Paper Stacker/Tray, #5545 \$80SUC \$ 80 NC

Paper Carrier: Guides paper onto the paper stacker/tray as paper leaves the 3736 printer. The paper carrier also has a tear-off blade and rod to hold continuous roll paper.

Paper Carrier #5540 62SUC 62 NC

3736 ADDITIONAL PRINT WHEELS

Additional print wheels for the 3736 may be ordered

Specify quantity required,

quoting following part numbers, as appropriate:

	Courier 10-pitch	Prestige Pica 10-pitch	Prestige Elite 12-pitch	Letter Gothic 12-pitch	Purchase	MMMC
English (US)	1257503	1257507	1257504	1257506		
ASCII	1257612	—	—	—		
3736 Additional Print Wheels					\$ 19	N/C

3762 DOCUMENT TRAYS

The 3762 is shipped with two document trays. Additional or replacement trays may be purchased.

	Purchase	MMMC
Document tray, Part No. 2716872	\$ 12	

3845/3846 ACCESSORIES

Personalization/Key Entry Unit: [3845 and 3846] One unit is needed at each site having a 3845 or 3846 for entry of the key variable, seed, and personalization data.

Personalization/Key Entry Unit ... IBM Part No. 4407908 \$ 265 **

Mounting Plate: [3846 only] One unit is needed for each four of 3846 models 1, 2, 3, 12, 13 to permit placing the 3846 in a rack.

Mounting Plate ... IBM Part No. 6813128 30 —

Blank Panel: [3846 only] A blank panel may be ordered to cover an unused 3846 opening in the accessory mounting plate.

Blank Panel ... IBM Part No. 4409058 5 —

Battery: [3845 and 3846] A battery is needed to replace the installed battery. The replacement schedule is defined in the Principles of Operation Manual. Discharged batteries should be returned to IBM.

Battery ... IBM Part No. 1743456 17 —

** Warranty: Services are available at the designated IBM Repair Center during the 90 day warranty period, which commences 30 days following date of shipment from the Plant of Manufacture. It shall be the customer's responsibility to determine the failing unit and if the unit is still under warranty to pack it in the designated shipping container and ship it pre-paid to the designated IBM Repair Center.

IBM Maintenance Agreements are not available. Field Engineering on-site service will not be provided.

3890 MICROFILM CASSETTE

The film cassette provides space for take-up of the film as well as the film supply. Capacity is 2,000 feet of .0027 polyester thin base film. The cassette must be loaded in a dark room. Disclosure specifications covering the film, cassette and core on which the film must be wound, are available from IBM Industry Relations/Product Information, Dept. 767, CHQ, Old Orchard Road, Armonk, N. Y. 10504.

	Purchase	MMMC	FIC
Microfilm Cassette, Part No. 2647900	\$ 424	NC	NC

* Corrects prices.



ACCESSORIES

4300 PROCESSORS

Console Table, 4300 Processors: An operator workstation with modesty skirt and capabilities for two operators with two 3278 mdl 2As and room for reference material. Attachable book racks may be ordered for manual storage. They also serve as a cable control device for the 3278 mdl 2A, telephone, etc. The table, whose dimensions are 1,590mm x 815mm, is equipped with gliders. Specify color code for the Console Table, 4300 Processors (#1550).

- #9161 - Willow Green
- #9162 - Garnet Rose
- #9163 - Sunrise Yellow
- #9164 - Classic Blue
- #9165 - Charcoal Brown
- #9166 - Pebble Gray

	Feature	Purchase
Console Table, 4300 Processors	#1550	\$395
Bookrack and Cable Holder, 4300 Processors	1480	25