

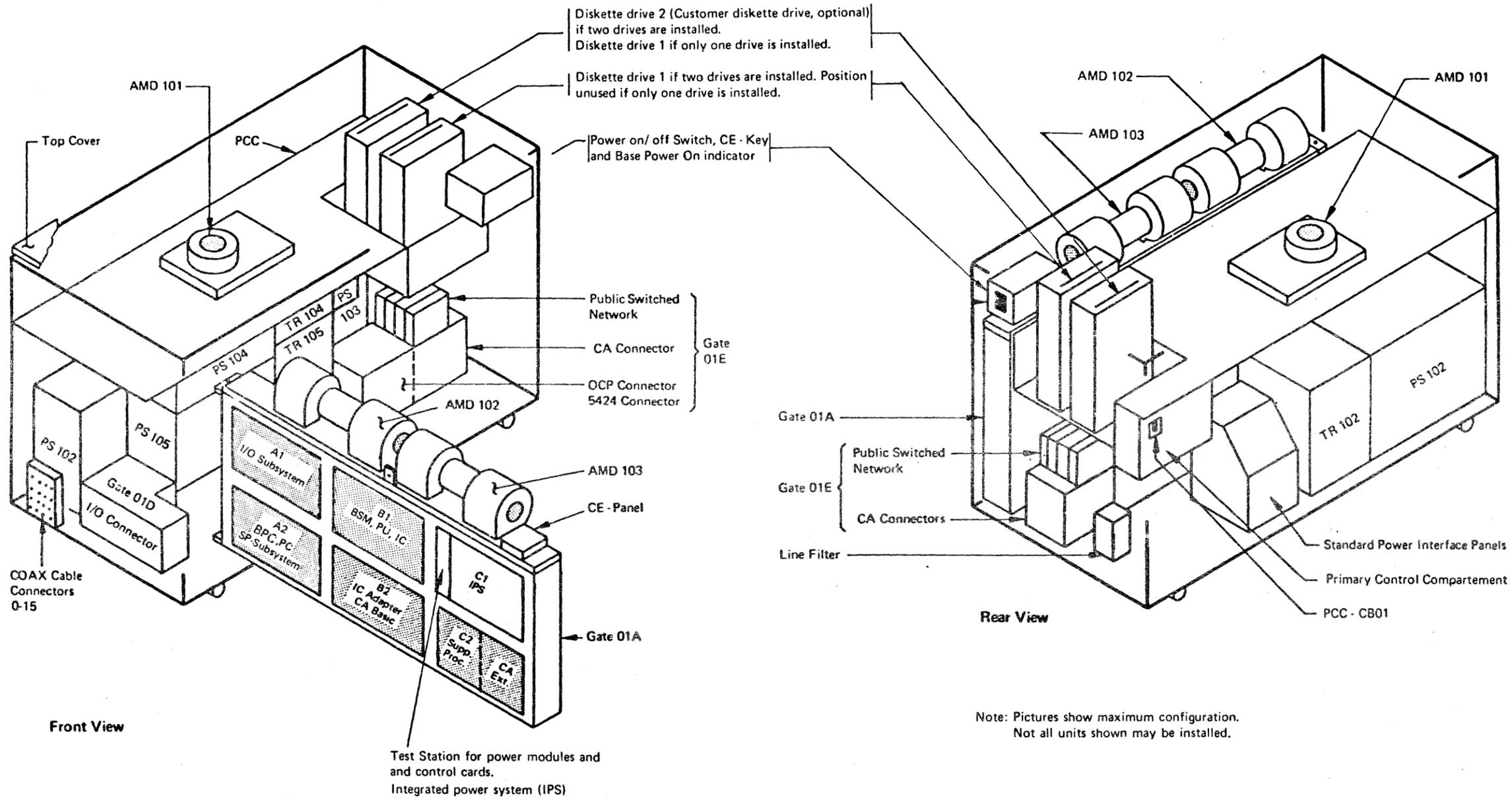
Supplement to MAPs, Section 1: LOCATIONS

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Physical Locations

This page shows the maximum configuration for the processor 4331, Model 2.
 The maximum configuration for the processor 4331-11 does not include all units shown.



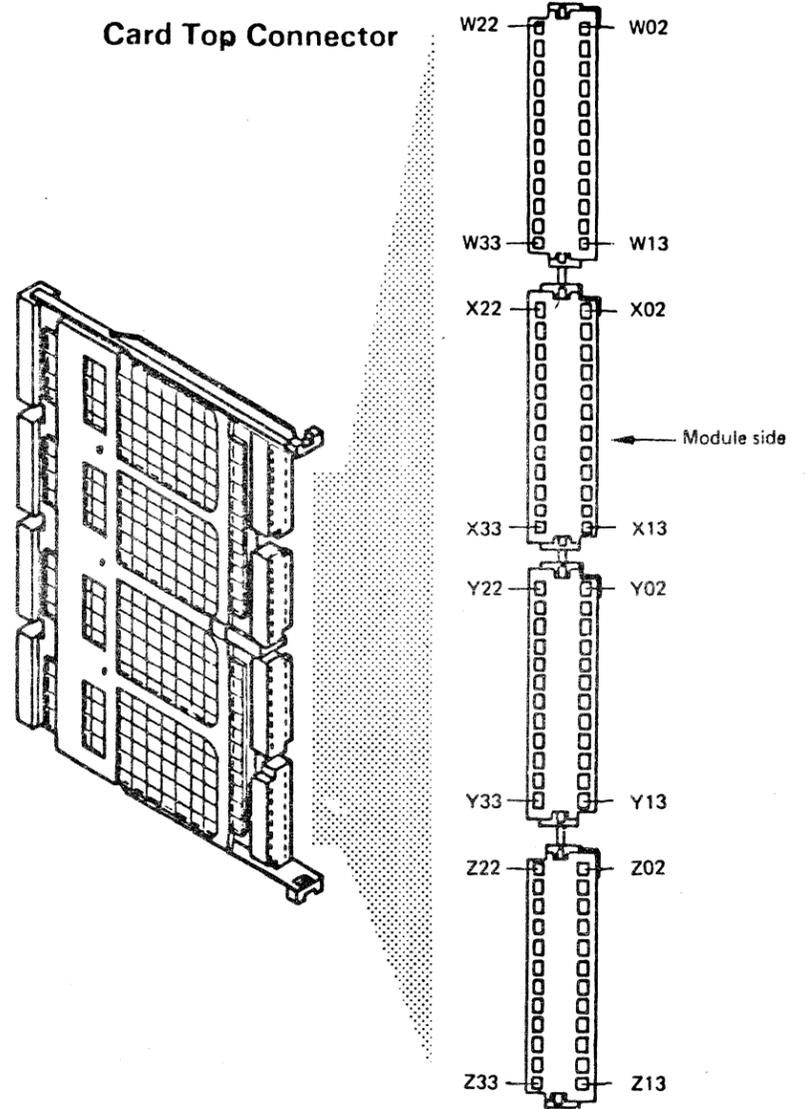
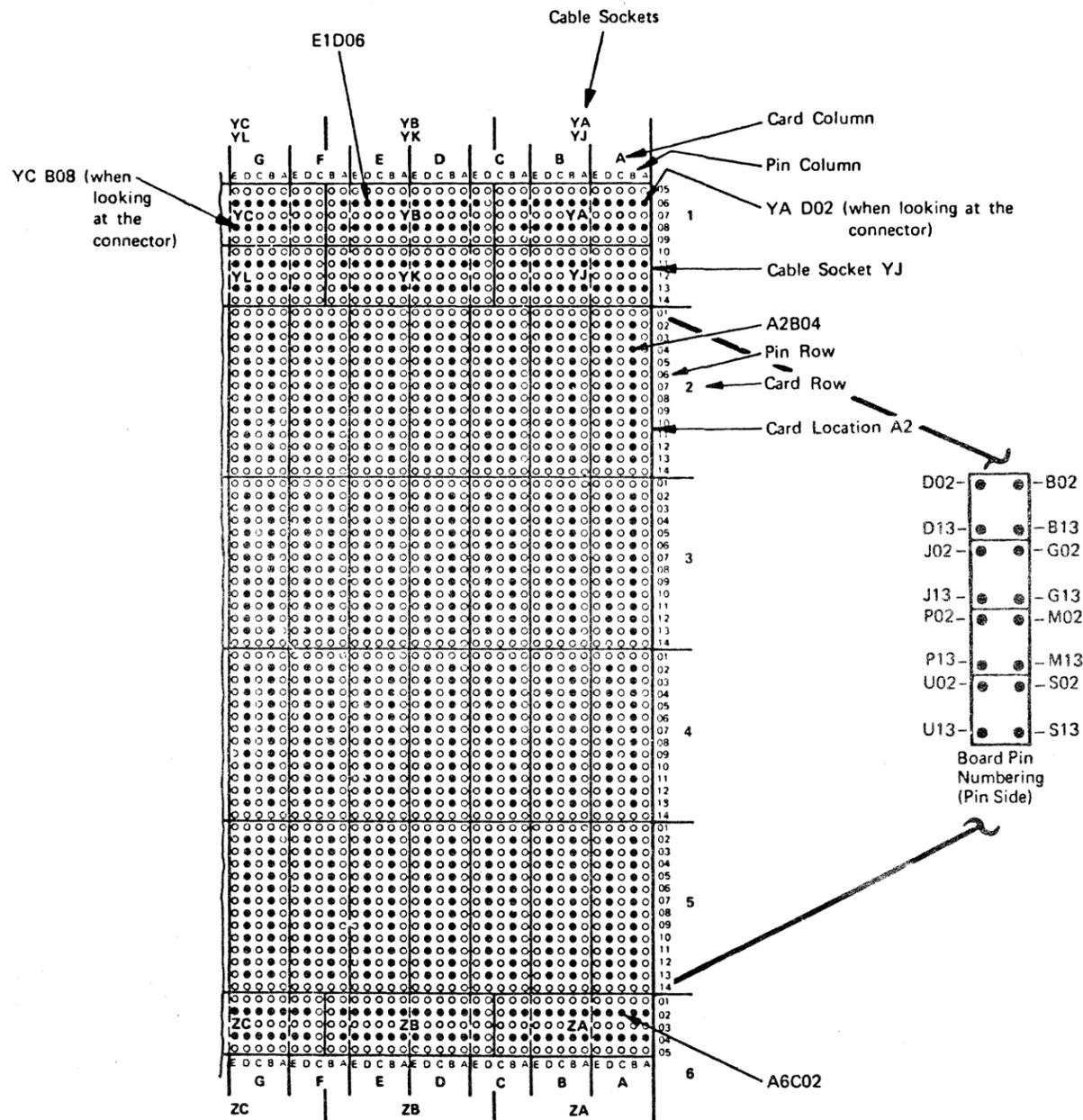
Note: Pictures show maximum configuration.
 Not all units shown may be installed.

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 ADB1020

STM

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Pins and Top Connectors Numbering of 22 Position Board *



* From Pin Side

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Use of Cards

Note: This page shows the maximum configuration for the processor 4331, Model 2.

The maximum configuration for the processor 4331-11 does not include all cards shown.

On the following pages all cards belonging to a unit are sequentially numbered, for example the cards of the processing unit are named PU cards 1 through 7. The following list gives, where possible, the meaning (use) of the card.

Board	Code Card	Card Number	Use of Card	
A1	SF5	IOC card 5	Control store ext.	} Note 1
	SF5	IOC card 6	Control store ext.	
B1	QA5/QS2	PU card 1	Control store	} Note 3
	QA5	PU card 2	Control store	
	QC5/QC4	PU card 3	Control card	} Note 4
	QC3	PU card 4	ALU card	
	QC2	PU card 5	Storage interface	} Note 4
	QC7/QC6	PU card 6	Cache store	
	QC9	PU card 7	Data mover	} Note 2
	QD1	BSM card 1	Storage control	
		BSM card 2	Main store	
		BSM card 3	Main store	
	BSM card 4	Main store		
	BSM card 5	Main store		
	BSM card 6	Main store		
	BSM card 7	Main store		
	BSM card 8	Main store		
	BSM card 9	Main store		
B2	QG3	MPX card 1	SCA interface card	} Note 1
	QG2	MPX card 2	SCA card	
	QG3	BMPX (X) card 1	SCA interface card	} Note 1
	QG2	BMPX (X) card 2	SCA card	
	QF3	FTA (X) card 1	CTLI card	} Note 1
	QF2	FTA (X) card 2	Control card	
	QF1	FTA (X) card 3	Data card	} Note 1
	QG3	HSC card 1	HSC interface card	
	QG5	HSC card 2	HSC adapter card	
	QG4	HSC card 3	HSC-IC bus link	
C2	SF5	SP card 5	Control store ext.	} Note 1
	SF5/SF9	SP card 6	Control store ext.	

For card code and P/N refer to PA13 or plug chart in Volume 30.

Notes:

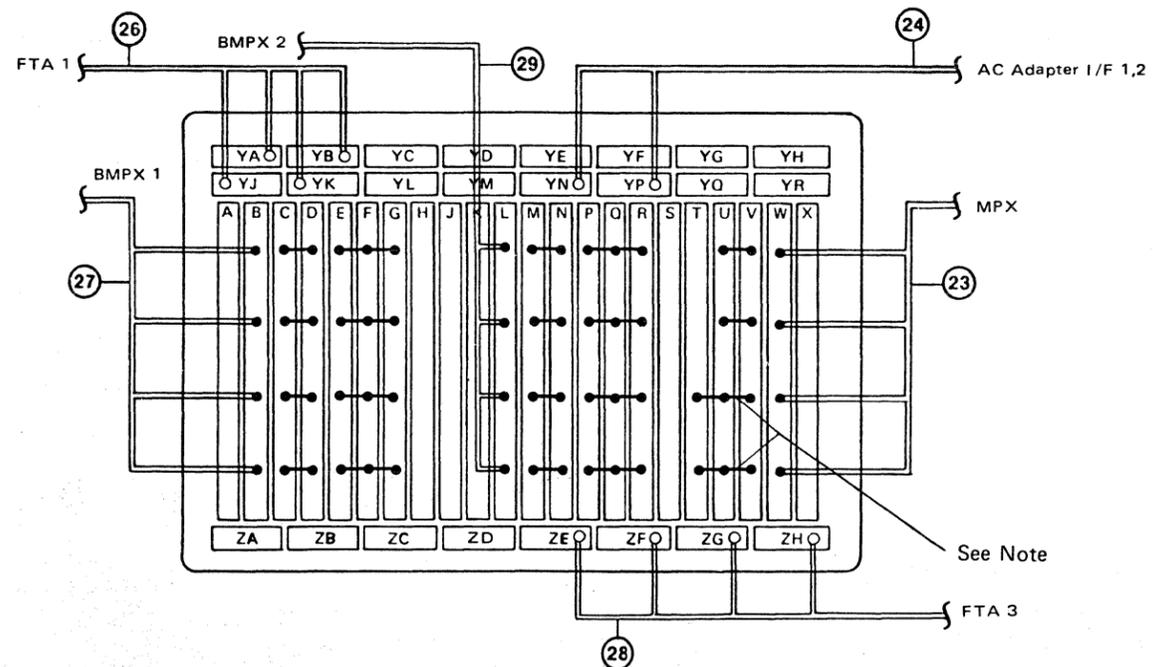
- In case of IOSS Processor (A1 Board):
If the SF5 cards are plugged a QH8 card must be plugged in F2.

In case of MSSS Processor (C2 Board):
If the SF5 cards are plugged a QH7 card must be plugged in G2.
If a SF9 card is plugged it requires a QJ7 in G2.

- 0,5 MB cards QD7 may be replaced by 0,5 MB card QD6, or groups of 0.5 MB cards may be replaced by 1.0 MB cards. Refer to the card plug list in Vol. 30 and table on page 6190 of this manual.
- The PU control store may consist of two 64 KB cards (QA5) or one 128 KB card (QS2).
- Card codes QC5 and QC7 are used on 4331 Model 2.
Card codes QC4 and QC6 are used on 4331 Model 11.

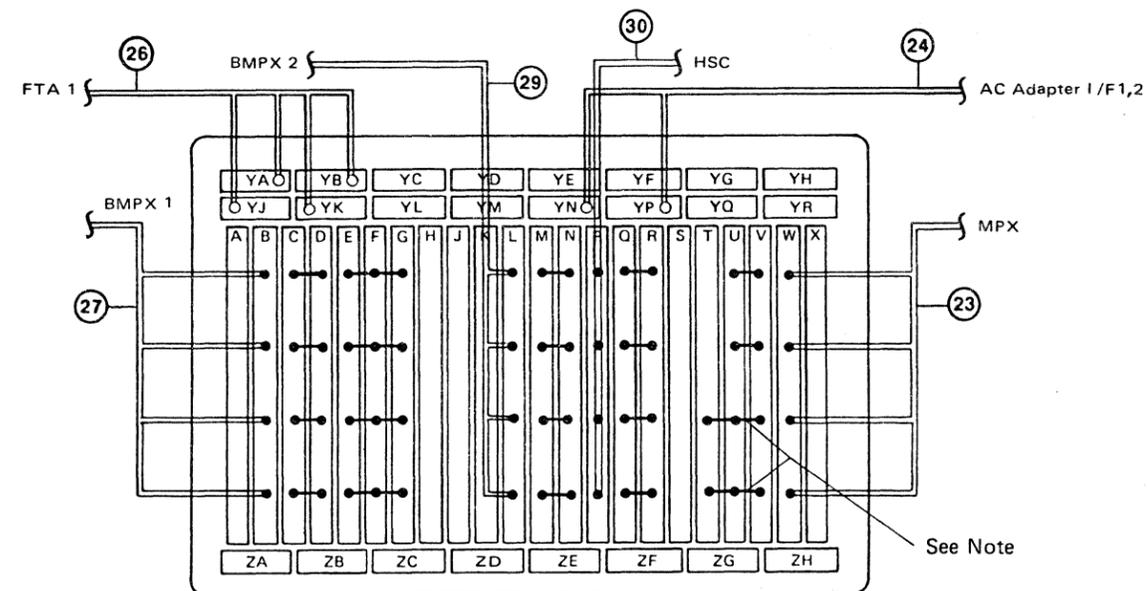
Cabling Layout for Gate 01A (continued)

Layout for Board B2-Version 1 (4331 Model 2 only)

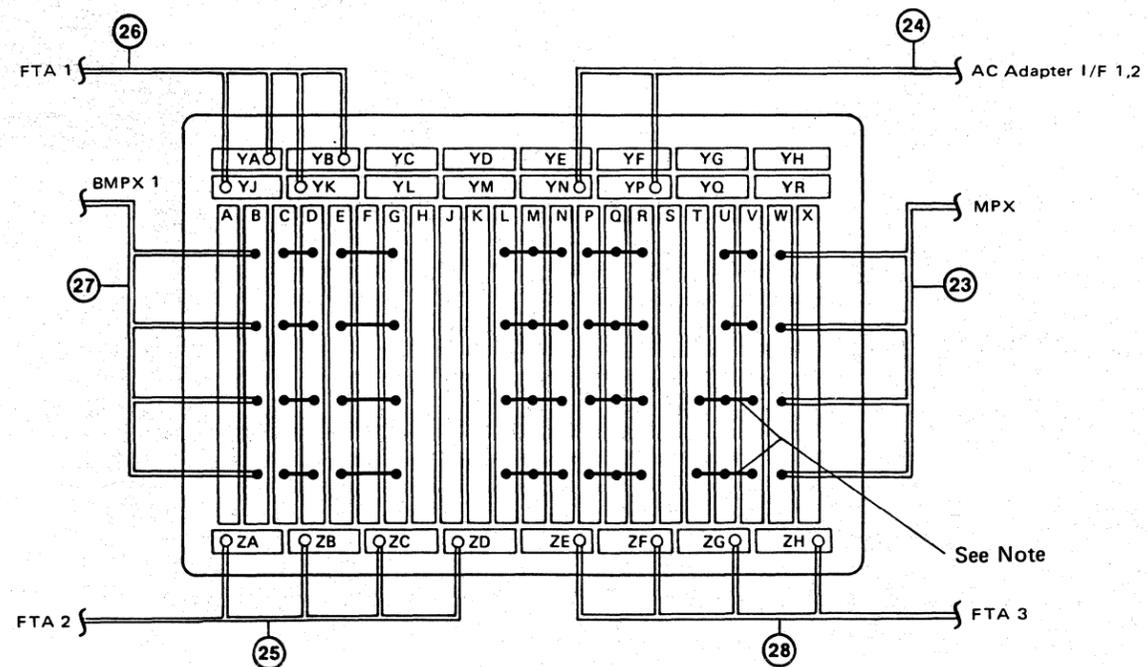


Layout for Board B2-Version 3

(4331 Model 2 only)



Layout for Board B2-Version 2



Note: 3-position crossover (T-U-V) if CA or CA with MPX installed.
2-position crossover (U-V) if MPX without CA installed.

Cable Locations for Gate 01A (continued)

Sequence number	Use of Cable	Location	
		From Board	To
37	Standard Power Interface	A2 - ZA	SPI - P00 CON00
38	PC	A2 - ZB	Board C1 - B4
39	CA Interface (line 36)	C2 - YD	Gate 01E - A4 - GJ
	CA Interface (line 37)	C2 - YM	Gate 01E - A5 - BD
	CA Interface (line 34)	C2 - YE	Gate 01E - A3 - GJ
	CA Interface (line 35)	C2 - YN	Gate 01E - A4 - BD
	CA Interface (line 32)	C2 - YF	Gate 01E - A2 - GJ
	CA Interface (line 33)	C2 - YP	Gate 01E - A3 - BD
	CA Interface (line 30)	C2 - YG	Gate 01E - A1 - GJ
	CA Interface (line 31)	C2 - YQ	Gate 01E - A2 - BD
40	Connection of MFCU	A1 - X2-W	Gate 01D - C1 (GJ)
	Connection of MFCU	A1 - X3-X	Gate 01D - C1 (BD)
	Connection of MFCU	A1 - X4-Y	Gate 01D - D1 (BD)
	Connection of MFCU	A1 - X5-Z	Gate 01D - A1 (BD)
	Connection of MFCU	A1 - W2-W	Gate 01D - E1 (GJ)
	Connection of MFCU	A1 - W3-X	Gate 01D - E1 (BD)
	Connection of MFCU	A1 - W4-Y	Gate 01D - F1 (BD)
	Connection of MFCU	A1 - W5-Z	Gate 01D - F1 (GJ)
	Connection of MFCU	A1 - YP	Gate 01D - B1 (GJ)
	Connection of MFCU	A1 - YQ	Gate 01D - D1 (GJ)
	Connection of MFCU	A1 - YR	Gate 01D - B1 (BD)
41	Remote link terminal	A2 - ZH	Tailgate 01E - A1 - BD
42	External Signal Bus	B1 - A3B	Gate 01D - G1
43	Voltage sense PU/BSM (PDL 5 only)	B1 - B4A	Board A2 - ZC

Interface Cable Routing: Card Pin to Tailgate

FTA 1 Cable Routing

SIGNAL NAME	CARD PIN	BOARD PIN	BRD CON.	TAIL GATE	CABLE TYPE
CTL1 BUS OUT BIT P	01A-B2E2-M10	01A-B2A1-A06	YA	01D-A2-B03	BUS
CTL1 BUS OUT BIT 0	01A-B2E2-S11	01A-B2A1-B06	YA	01D-A2-D04	BUS
CTL1 BUS OUT BIT 1	01A-B2E2-P06	01A-B2A1-D08	YA	01D-A2-B05	BUS
CTL1 BUS OUT BIT 2	01A-B2E2-U11	01A-B2A1-E06	YA	01D-A2-D06	BUS
CTL1 BUS OUT BIT 3	01A-B2E2-P12	01A-B2B1-B08	YA	01D-A2-B08	BUS
CTL1 BUS OUT BIT 4	01A-B2E2-P11	01A-B2B1-C06	YA	01D-A2-D09	BUS
CTL1 BUS OUT BIT 5	01A-B2E2-M12	01A-B2B1-D08	YA	01D-A2-B10	BUS
CTL1 BUS OUT BIT 6	01A-B2E2-M11	01A-B2B1-E06	YA	01D-A2-D11	BUS
CTL1 BUS OUT BIT 7	01A-B2E2-P10	01A-B2C1-A08	YA	01D-A2-B12	BUS
CTL1 CE COMM OUT	01A-B2E2-P07	01A-B2A1-E08	YA	01D-A2-B06	BUS
CTL1 CE COMM IN	01A-B2E2-U12				
CTL1 SYNC OUT AD4	01A-B2E2-M13	01A-B2C1-B06	YA	01D-A2-D13	BUS
CTL1 BUS IN BIT P	01A-B2E2-S08	01A-B2C1-E06	YB	01D-A2-G03	BUS
CTL1 BUS IN BIT 0	01A-B2E2-U06	01A-B2D1-A06	YB	01D-A2-J04	BUS
CTL1 BUS IN BIT 1	01A-B2E2-S06	01A-B2D1-C08	YB	01D-A2-G05	BUS
CTL1 BUS IN BIT 2	01A-B2E2-U07	01A-B2D1-D06	YB	01D-A2-J06	BUS
CTL1 BUS IN BIT 3	01A-B2E2-S07	01A-B2E1-A08	YB	01D-A2-G08	BUS
CTL1 BUS IN BIT 4	01A-B2E2-P02	01A-B2E1-B06	YB	01D-A2-J09	BUS
CTL1 BUS IN BIT 5	01A-B2E2-M02	01A-B2E1-C08	YB	01D-A2-G10	BUS
CTL1 BUS IN BIT 6	01A-B2E2-M03	01A-B2E1-D06	YB	01D-A2-J11	BUS
CTL1 BUS IN BIT 7	01A-B2E2-M04	01A-B2E1-E08	YB	01D-A2-G12	BUS
CTL1 SYNC IN	01A-B2F2-B13	01A-B2F1-A06	YB	01D-A2-J13	BUS
CTL1 TAG BUS BIT P	01A-B2E2-M07	01A-B2B1-C11	YJ	01D-B2-D09	TAG
CTL1 TAG BUS BIT 0	01A-B2E2-M06	01A-B2A1-A11	YJ	01D-B2-B03	TAG
CTL1 TAG BUS BIT 4	01A-B2E2-U02	01A-B2A1-D13	YJ	01D-B2-B05	TAG
CTL1 TAG BUS BIT 5	01A-B2E2-S03	01A-B2A1-B11	YJ	01D-B2-D04	TAG
CTL1 TAG BUS BIT 6	01A-B2E2-S02	01A-B2B1-B13	YJ	01D-B2-B08	TAG
CTL1 TAG BUS BIT 7	01A-B2E2-M08	01A-B2A1-E11	YJ	01D-B2-D06	TAG
CTL1 TAG GATE	01A-B2E2-S13	01A-B2B1-D13	YJ	01D-B2-B10	TAG
CTL1 RESPONSE	01A-B2E2-S04	01A-B2C1-A13	YJ	01D-B2-B12	TAG
CTL1 SEL HOLD AD4	01A-B2E2-S05	01A-B2B1-E11	YJ	01D-B2-D11	TAG
CTL1 RECYCLE	01A-B2E2-M09	01A-B2C1-B11	YJ	01D-B2-D13	TAG
CTL1 SELECT ACTIVE	01A-B2E2-U09	01A-B2C1-E11	YK	01D-B2-G03	TAG
CTL1 NORMAL END	01A-B2E2-U10	01A-B2D1-C13	YK	01D-B2-G05	TAG
CTL1 SEL ALERT1	01A-B2E2-P05	01A-B2E1-A13	YK	01D-B2-G08	TAG
CTL1 UNSEL ALERT 1	01A-B2E2-M05	01A-B2E1-E13	YK	01D-B2-G12	TAG
CTL1 TAG VALID	01A-B2E2-S09	01A-B2D1-A11	YK	01D-B2-J04	TAG
CTL1 CHECK END	01A-B2E2-P04	01A-B2D1-D11	YK	01D-B2-J06	TAG
CTL1 SEL ALERT 2	01A-B2E2-S10	01A-B2E1-B11	YK	01D-B2-J09	TAG

FTA 2 Cable Routing

SIGNAL NAME	CARD PIN	BOARD PIN	BRD CON.	TAIL GATE	CABLE TYPE
CTL2 BUS OUT BIT P	01A-B2L2-M10	01A-B2A6-A02	ZA	01D-C2-B03	BUS
CTL2 BUS OUT BIT 0	01A-B2L2-S11	01A-B2A6-B02	ZA	01D-C2-D04	BUS
CTL2 BUS OUT BIT 1	01A-B2L2-P06	01A-B2A6-D04	ZA	01D-C2-B05	BUS
CTL2 BUS OUT BIT 2	01A-B2L2-U11	01A-B2A6-E02	ZA	01D-C2-D06	BUS
CTL2 BUS OUT BIT 3	01A-B2L2-P12	01A-B2B6-B04	ZA	01D-C2-B08	BUS
CTL2 BUS OUT BIT 4	01A-B2L2-P11	01A-B2B6-C02	ZA	01D-C2-D09	BUS
CTL2 BUS OUT BIT 5	01A-B2L2-M12	01A-B2B6-D04	ZA	01D-C2-B10	BUS
CTL2 BUS OUT BIT 6	01A-B2L2-M11	01A-B2B6-E02	ZA	01D-C2-D11	BUS
CTL2 BUS OUT BIT 7	01A-B2L2-P10	01A-B2C6-A04	ZA	01D-C2-B12	BUS
CTL2 CE COMM OUT	01A-B2L2-P07	01A-B2A6-E04	ZA	01D-C2-B06	BUS
CTL2 CE COMM IN	01A-B2L2-U12				
CTL2 SYNC OUT AD2	01A-B2L2-M13	01A-B2C6-B02	ZA	01D-C2-D13	BUS
CTL2 BUS IN BIT P	01A-B2L2-S08	01A-B2C6-E02	ZB	01D-C2-G03	BUS
CTL2 BUS IN BIT 0	01A-B2L2-U06	01A-B2D6-A02	ZB	01D-C2-J04	BUS
CTL2 BUS IN BIT 1	01A-B2L2-S06	01A-B2D6-C04	ZB	01D-C2-G05	BUS
CTL2 BUS IN BIT 2	01A-B2L2-U07	01A-B2D6-D02	ZB	01D-C2-J06	BUS
CTL2 BUS IN BIT 3	01A-B2L2-S07	01A-B2E6-A04	ZB	01D-C2-G08	BUS
CTL2 BUS IN BIT 4	01A-B2L2-P02	01A-B2E6-B02	ZB	01D-C2-J09	BUS
CTL2 BUS IN BIT 5	01A-B2L2-M02	01A-B2E6-C04	ZB	01D-C2-G10	BUS
CTL2 BUS IN BIT 6	01A-B2L2-M03	01A-B2E6-D02	ZB	01D-C2-J11	BUS
CTL2 BUS IN BIT 7	01A-B2L2-M04	01A-B2E6-E04	ZB	01D-C2-G12	BUS
CTL2 SYNC IN	01A-B2M2-B13	01A-B2F6-A02	ZB	01D-C2-J13	BUS
CTL2 TAG BUS BIT P	01A-B2L2-M07	01A-B2H6-A02	ZC	01D-D2-D09	TAG
CTL2 TAG BUS BIT 0	01A-B2L2-M06	01A-B2F6-D02	ZC	01D-D2-B03	TAG
CTL2 TAG BUS BIT 4	01A-B2L2-U02	01A-B2G6-B04	ZC	01D-D2-B05	TAG
CTL2 TAG BUS BIT 5	01A-B2L2-S03	01A-B2F6-E02	ZC	01D-D2-D04	TAG
CTL2 TAG BUS BIT 6	01A-B2L2-S02	01A-B2G6-E04	ZC	01D-D2-B08	TAG
CTL2 TAG BUS BIT 7	01A-B2L2-M08	01A-B2G6-C02	ZC	01D-D2-D06	TAG
CTL2 TAG GATE	01A-B2L2-S13	01A-B2H6-B04	ZC	01D-D2-B10	TAG
CTL2 RESPONSE	01A-B2L2-S04	01A-B2H6-D04	ZC	01D-D2-B12	TAG
CTL2 SEL HOLD AD2	01A-B2L2-S05	01A-B2H6-C02	ZC	01D-D2-D11	TAG
CTL2 RECYCLE	01A-B2L2-M09	01A-B2H6-E02	ZC	01D-D2-D13	TAG
CTL2 SELECT ACTIVE	01A-B2L2-U09	01A-B2J6-C02	ZD	01D-D2-G03	TAG
CTL2 NORMAL END	01A-B2L2-U10	01A-B2K6-A04	ZD	01D-D2-G05	TAG
CTL2 SEL ALERT 1	01A-B2L2-P05	01A-B2K6-D04	ZD	01D-D2-G08	TAG
CTL2 UNSEL ALERT 1	01A-B2L2-M05	01A-B2L6-C04	ZD	01D-D2-G12	TAG
CTL2 TAG VALID	01A-B2L2-S09	01A-B2J6-D02	ZD	01D-D2-J04	TAG
CTL2 CHECK END	01A-B2L2-P04	01A-B2K6-B02	ZD	01D-D2-J06	TAG
CTL2 SEL ALERT 2	01A-B2L2-S10	01A-B2K6-E02	ZD	01D-D2-J09	TAG

HSC Cable Routing

SIGNAL NAME	CARD TOP CON- NECTOR PIN	TAILGATE PIN	CABLE TYP
BUS OUT BIT P	01A-B2P2-W03	01D-E2-B03	BUS
BUS OUT BIT 0	01A-B2P2-W24	01D-E2-D04	BUS
BUS OUT BIT 1	01A-B2P2-W05	01D-E2-B05	BUS
BUS OUT BIT 2	01A-B2P2-W26	01D-E2-D06	BUS
BUS OUT BIT 3	01A-B2P2-W08	01D-E2-B08	BUS
BUS OUT BIT 4	01A-B2P2-W29	01D-E2-D09	BUS
BUS OUT BIT 5	01A-B2P2-W10	01D-E2-B10	BUS
BUS OUT BIT 6	01A-B2P2-W31	01D-E2-D11	BUS
BUS OUT BIT 7	01A-B2P2-W12	01D-E2-B12	BUS
BUS IN BIT P	01A-B2P2-X03	01D-E2-G03	BUS
BUS IN BIT 0	01A-B2P2-X24	01D-E2-J04	BUS
BUS IN BIT 1	01A-B2P2-X05	01D-E2-G05	BUS
BUS IN BIT 2	01A-B2P2-X26	01D-E2-J06	BUS
BUS IN BIT 3	01A-B2P2-X08	01D-E2-G08	BUS
BUS IN BIT 4	01A-B2P2-X29	01D-E2-J09	BUS
BUS IN BIT 5	01A-B2P2-X10	01D-E2-G10	BUS
BUS IN BIT 6	01A-B2P2-X31	01D-E2-J11	BUS
BUS IN BIT 7	01A-B2P2-X12	01D-E2-G12	BUS
MARK OUT	01A-B2P2-W33	01D-E2-D13	BUS
MARK IN	01A-B2P2-X33	01D-E2-J13	BUS
ADDRESS OUT	01A-B2P2-Y10	01D-F2-B10	TAG
COMMAND OUT	01A-B2P2-Y31	01D-F2-D11	TAG
SERVICE OUT	01A-B2P2-Y33	01D-F2-D13	TAG
DATA OUT	01A-B2P2-Z10	01D-F2-G10	TAG
SUPRESS OUT	01A-B2P2-Y12	01D-F2-G12	TAG
OPERATIONAL OUT	01A-B2P2-Z33	01D-F2-J13	TAG
HOLD/SELECT OUT	01A-B2P2-Y29	01D-F2-D09	TAG
COND SUPPR OUT	01A-B2P2-Y12	01D-F2-B12	TAG
METERING OUT	01A-B2P2-Z24	01D-E2-J04	TAG
ADDRESS IN	01A-B2P2-Y05	01D-F2-B05	TAG
STATUS IN	01A-B2P2-Y24	01D-F2-D04	TAG
SERVICE IN	01A-B2P2-Y26	01D-F2-D06	TAG
DATA IN	01A-B2P2-Z08	01D-F2-G08	TAG
DISCONNECT IN	01A-B2P2-Z31	01D-F2-J11	TAG
OPERATIONAL IN	01A-B2P2-Y03	01D-F2-B03	TAG
SELECT IN	01A-B2P2-Y08	01D-F2-B08	TAG
REQUEST IN	01A-B2P2-Z26	01D-F2-J06	TAG
METERING IN	01A-B2P2-Z05	01D-F2-G05	TAG

MPX Cable Routing

SIGNAL NAME	CARD TOP CON- NECTOR PIN	TAILGATE PIN	CABLE TYP
BUS OUT BIT P	01A-B2W2-W03	01D-D3-B03	BUS
BUS OUT BIT 0	01A-B2W2-W24	01D-D3-D04	BUS
BUS OUT BIT 1	01A-B2W2-W05	01D-D3-B05	BUS
BUS OUT BIT 2	01A-B2W2-W26	01D-D3-D06	BUS
BUS OUT BIT 3	01A-B2W2-W08	01D-D3-B08	BUS
BUS OUT BIT 4	01A-B2W2-W29	01D-D3-D09	BUS
BUS OUT BIT 5	01A-B2W2-W10	01D-D3-B10	BUS
BUS OUT BIT 6	01A-B2W2-W31	01D-D3-D11	BUS
BUS OUT BIT 7	01A-B2W2-W12	01D-D3-B12	BUS
BUS IN BIT P	01A-B2W2-X03	01D-D3-G03	BUS
BUS IN BIT 0	01A-B2W2-X24	01D-D3-J04	BUS
BUS IN BIT 1	01A-B2W2-X05	01D-D3-G05	BUS
BUS IN BIT 2	01A-B2W2-X26	01D-D3-J06	BUS
BUS IN BIT 3	01A-B2W2-X08	01D-D3-G08	BUS
BUS IN BIT 4	01A-B2W2-X29	01D-D3-J09	BUS
BUS IN BIT 5	01A-B2W2-X10	01D-D3-G10	BUS
BUS IN BIT 6	01A-B2W2-X31	01D-D3-J11	BUS
BUS IN BIT 7	01A-B2W2-X12	01D-D3-G12	BUS
MARK OUT	01A-B2W2-W33	01D-D3-D13	BUS
MARK IN	01A-B2W2-X33	01D-D3-J13	BUS
ADDRESS OUT	01A-B2W2-Y10	01D-E3-B10	TAG
COMMAND OUT	01A-B2W2-Y31	01D-E3-D11	TAG
SERVICE OUT	01A-B2W2-Y33	01D-E3-D13	TAG
DATA OUT	01A-B2W2-Z10	01D-E3-G10	TAG
SUPRESS OUT	01A-B2W2-Y12	01D-E3-G12	TAG
OPERATIONAL OUT	01A-B2W2-Z33	01D-E3-J13	TAG
HOLD/SELECT OUT	01A-B2W2-Y29	01D-E3-D09	TAG
COND SUPPR OUT	01A-B2W2-Y12	01D-E3-B12	TAG
METERING OUT	01A-B2W2-Z24	01D-E3-J04	TAG
ADDRESS IN	01A-B2W2-Y05	01D-E3-B05	TAG
STATUS IN	01A-B2W2-Y24	01D-E3-D04	TAG
SERVICE IN	01A-B2W2-Y26	01D-E3-D06	TAG
DATA IN	01A-B2W2-Z08	01D-E3-G08	TAG
DISCONNECT IN	01A-B2W2-Z31	01D-E3-J11	TAG
OPERATIONAL IN	01A-B2W2-Y03	01D-E3-B03	TAG
SELECT IN	01A-B2W2-Y08	01D-E3-B08	TAG
REQUEST IN	01A-B2W2-Z26	01D-E3-J06	TAG
METERING IN	01A-B2W2-Z05	01D-E3-G05	TAG

IC-Bus 0 and 1

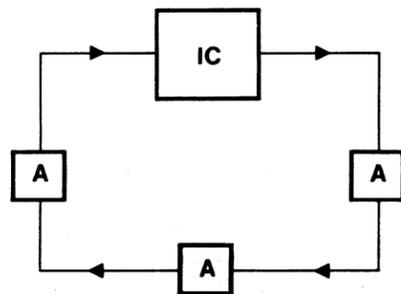
General Information

The integrated channel bus is the link between the processing unit and the adapters of the system. The bus is two bytes wide (data/address path) and also contains the request/response control lines. The IC-bus consists of three different types of lines

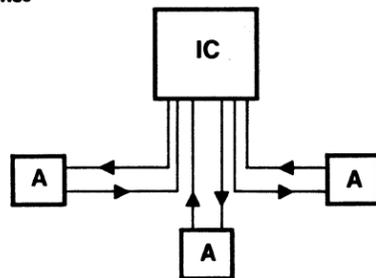
- Ring lines 1
- Star lines 2
- Stub lines 3

which are routed to the adapter in three different ways as shown below.

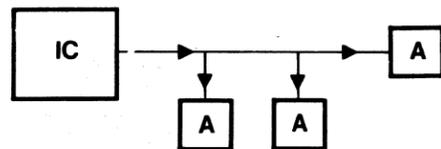
① Ring Lines



② Star Lines



③ Stub Lines



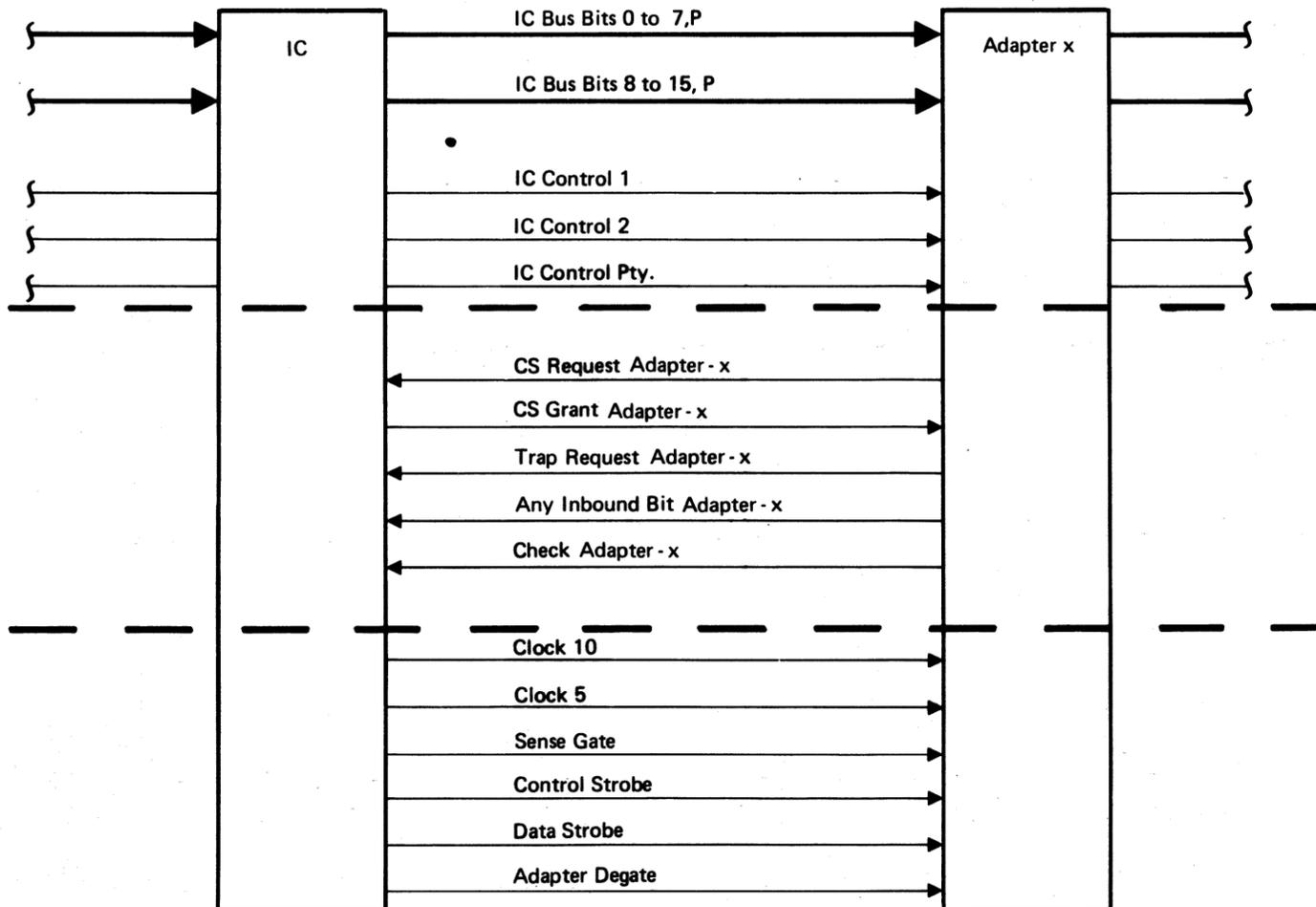
The 4331/2 system has two independently working IC-buses each servicing three adapters. The two buses are named IC-bus 0 and IC-bus 1.

Five different adapters (MPX/CA, SCA2, FTA2, FTA3, HSC) can be attached to the IC-bus 0, but only three can be attached at one time. This results in three base configurations (version 1, 2 and 3). Only three different adapters (FTA1, SCA1, BBA 0/1) can be attached to the IC-bus 1. This results in only one base configuration. The base configuration equals the maximum configuration of the bus. Depending on the configuration of the system only one or two adapters may be attached to IC-bus.

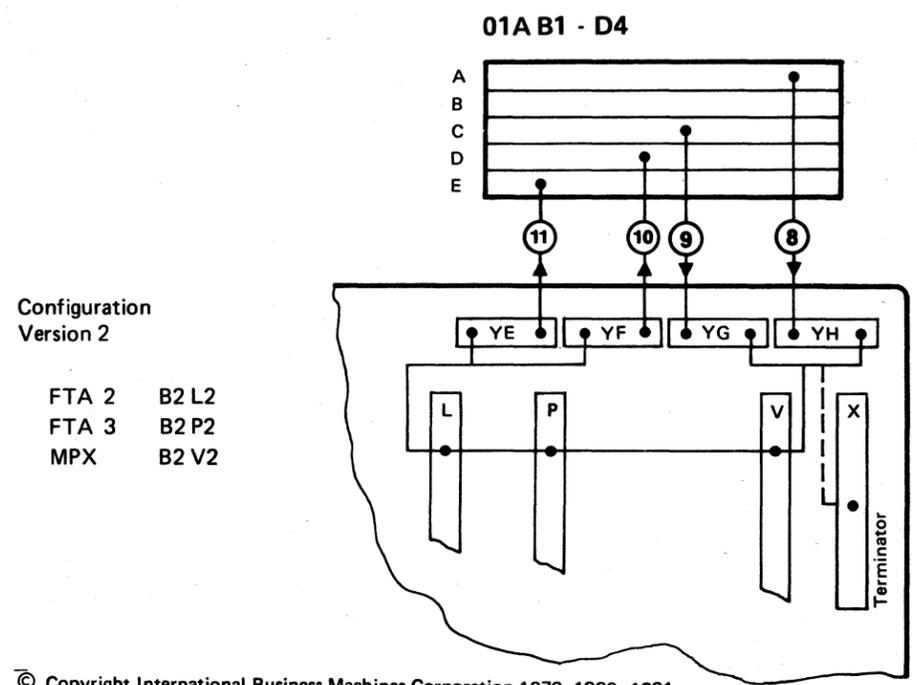
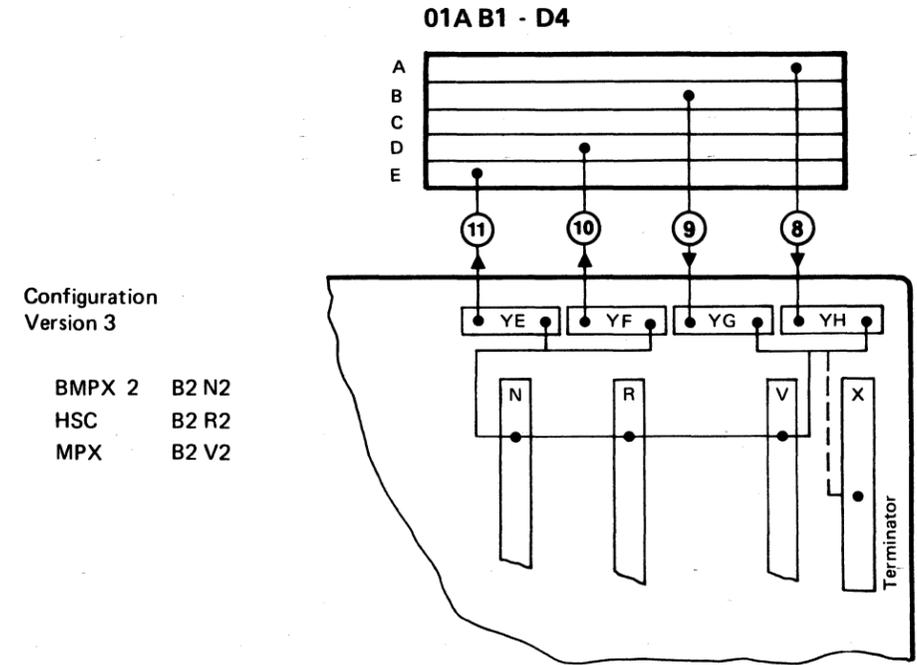
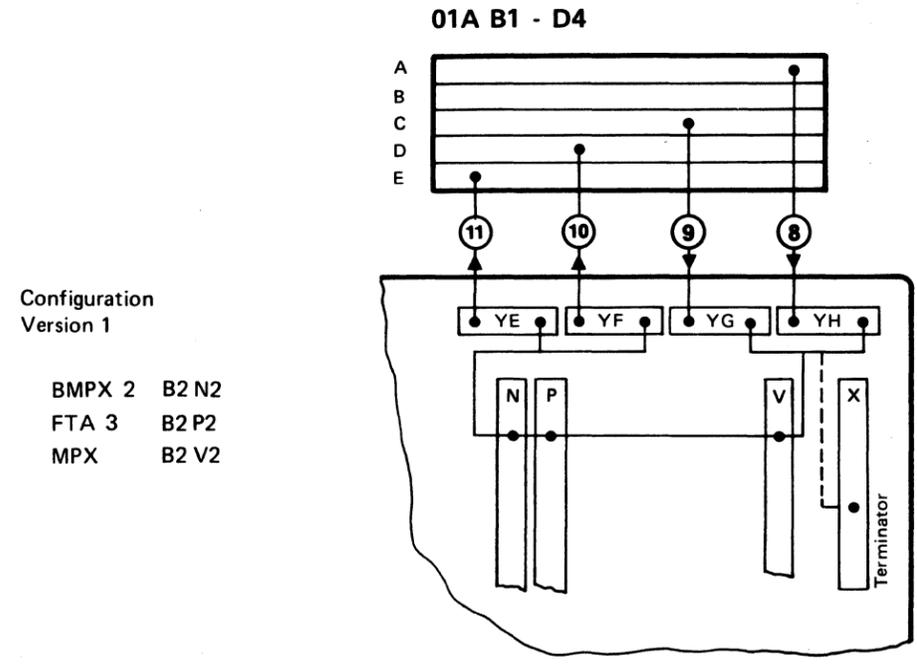
IC-Bus Adapter Addressing

The system uses a logical and physical address scheme to address the IC-bus adapters. The table below shows the relationship of the address schemes.

IC-Bus Number	Adapter	Logical Address	Physical Address
0	HSC	0	1
	FTA 3	1	2
	FTA 2 or BMPX 2	2	4
	MPX/CA	3	6
1	FTA 1	4	9
	BMPX 1	5	A
	BBA 0/1	7	E



Cable Layout of IC Bus 0—Detail A



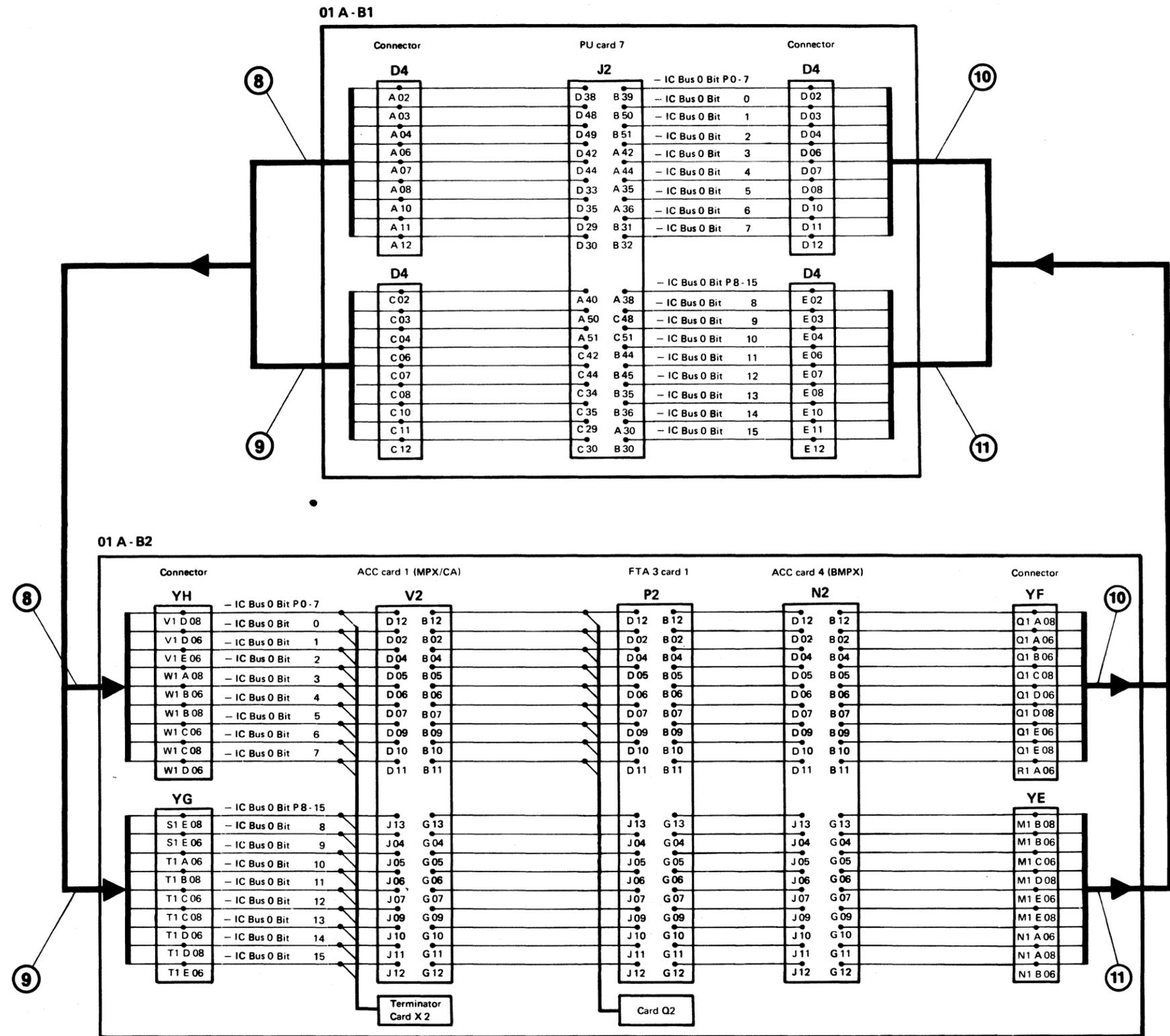
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EC 366269 03 Aug 79	EC 366284 27 Mar 80	EC 366388 23 Jan 81	P/N 5683391 Page 3 of 12	1 114	F
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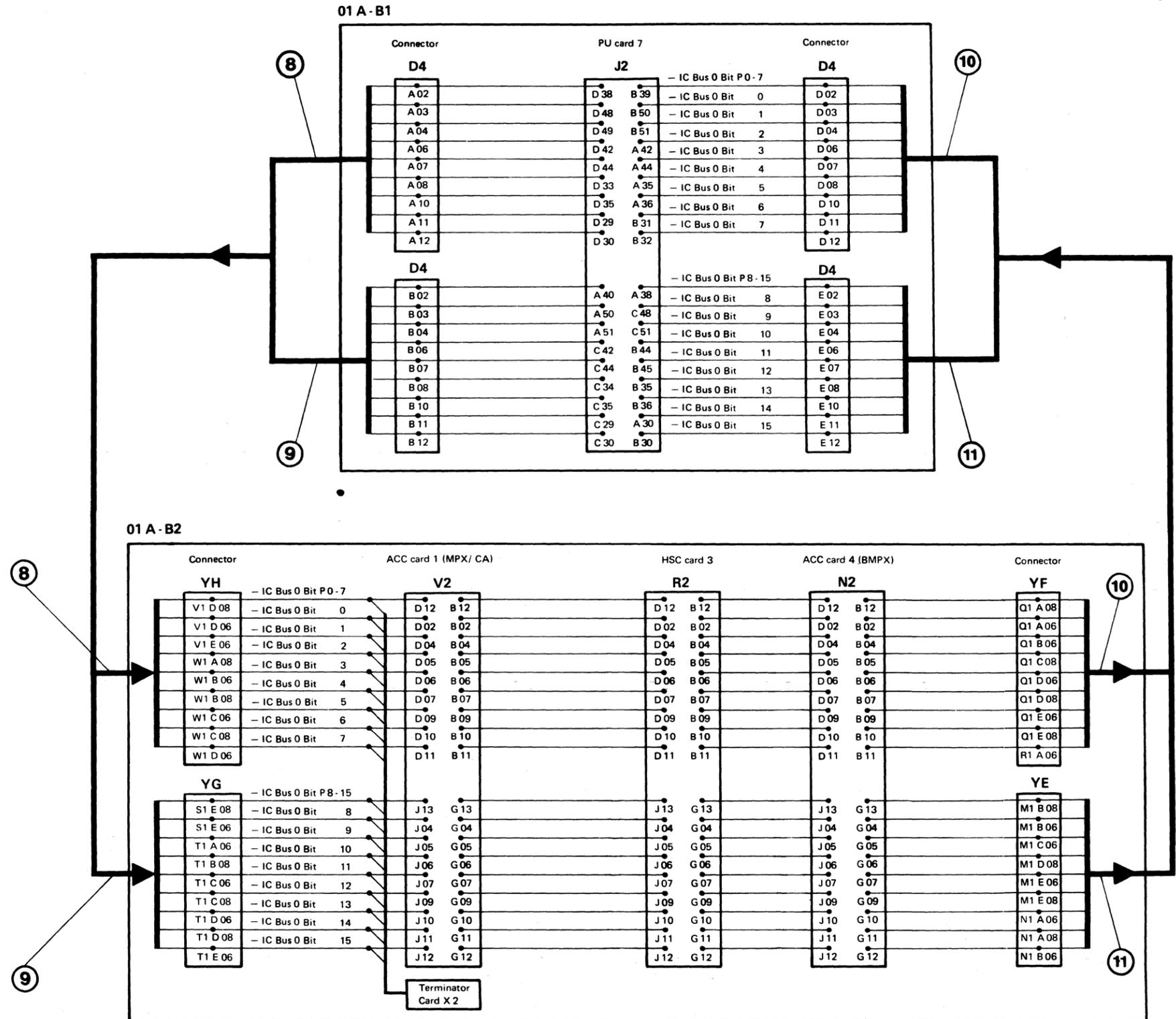
IC Bus 0 Ring Lines

This page shows the IC bus 0 'bus ring lines' for version 1.



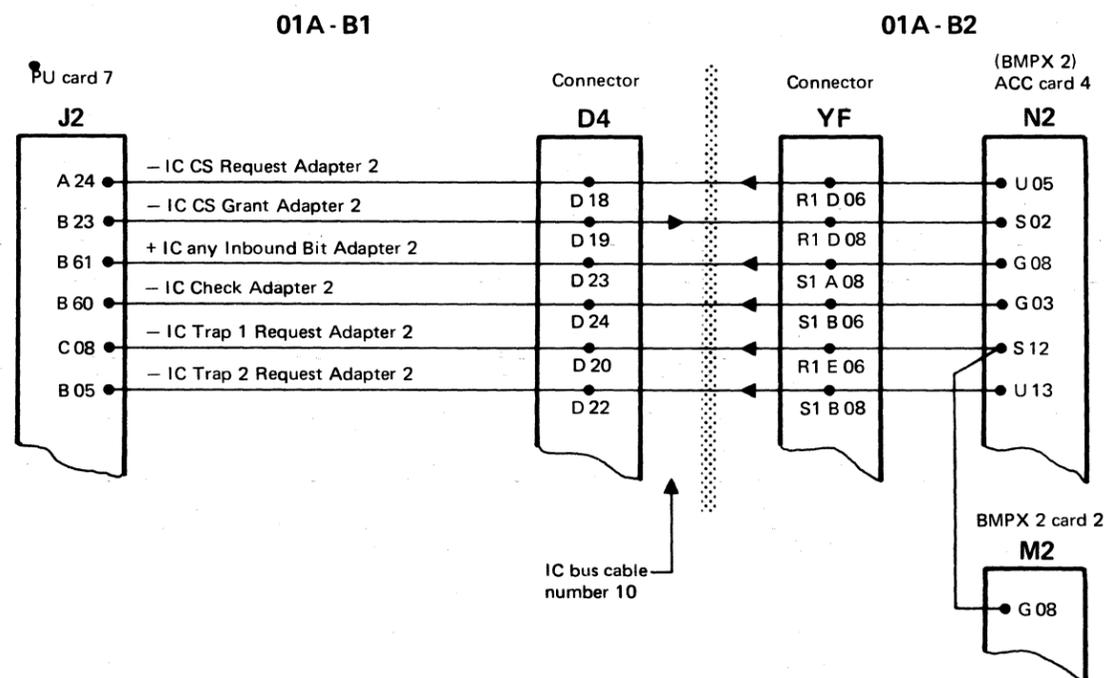
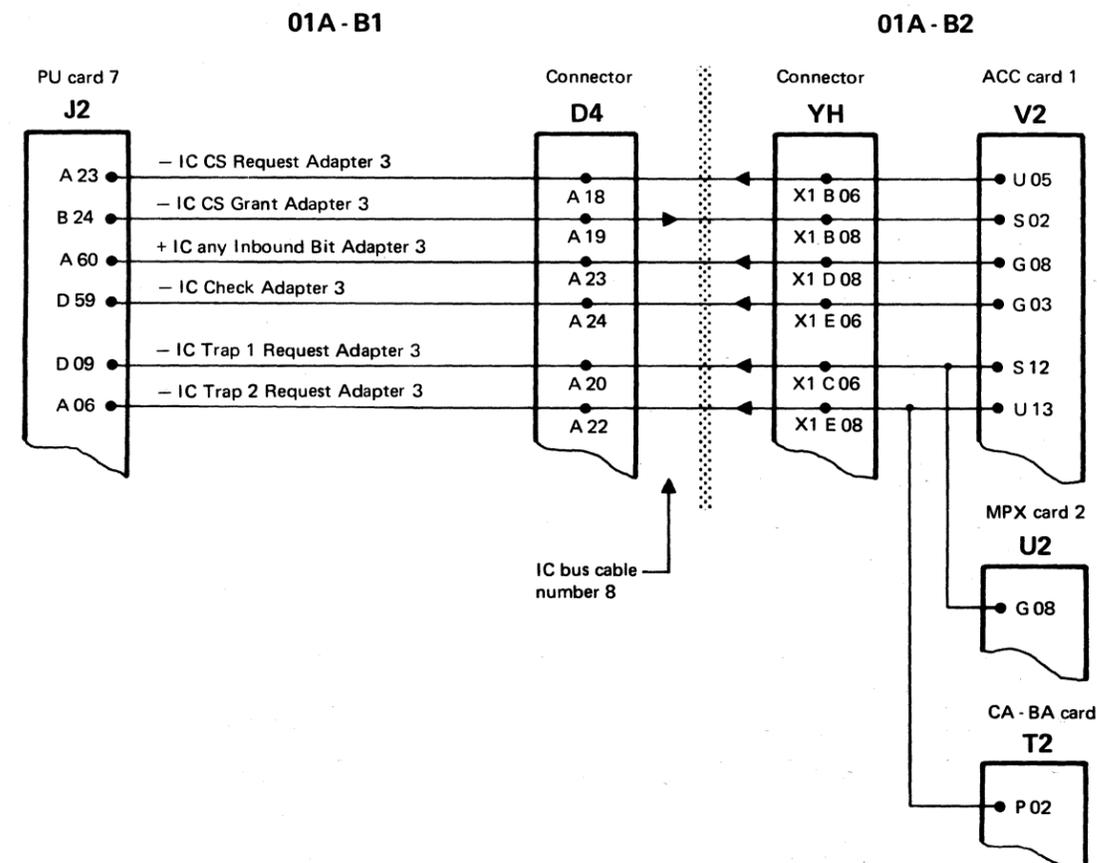
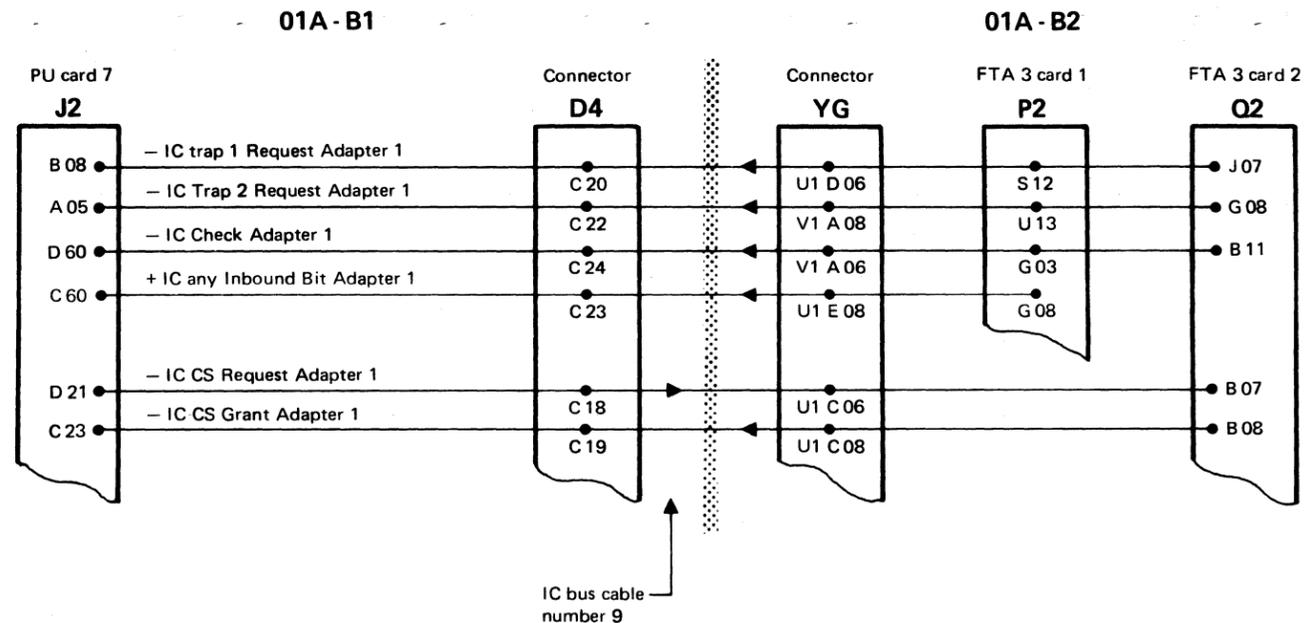
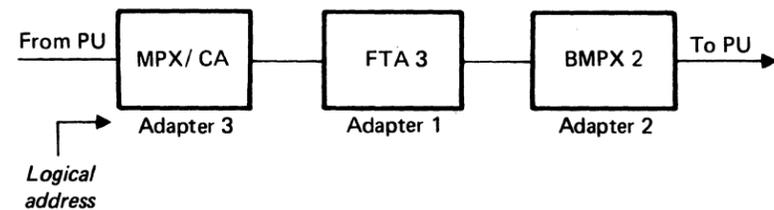
IC Bus 0 Ring Lines (continued)

This page shows the IC bus 0 'bus ring lines' for version 3



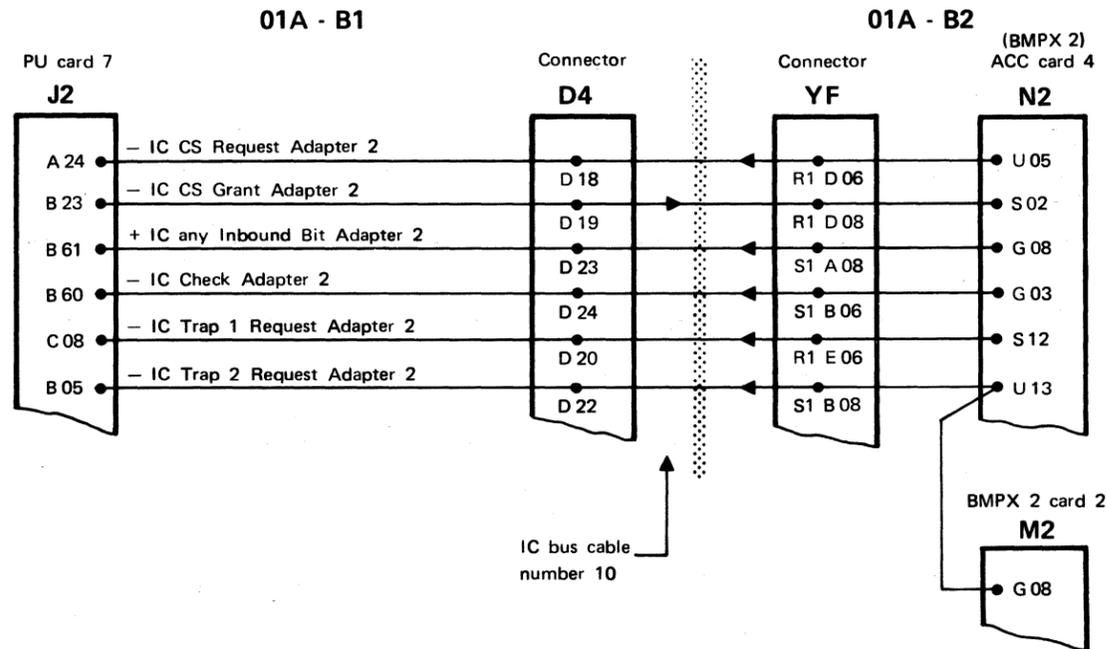
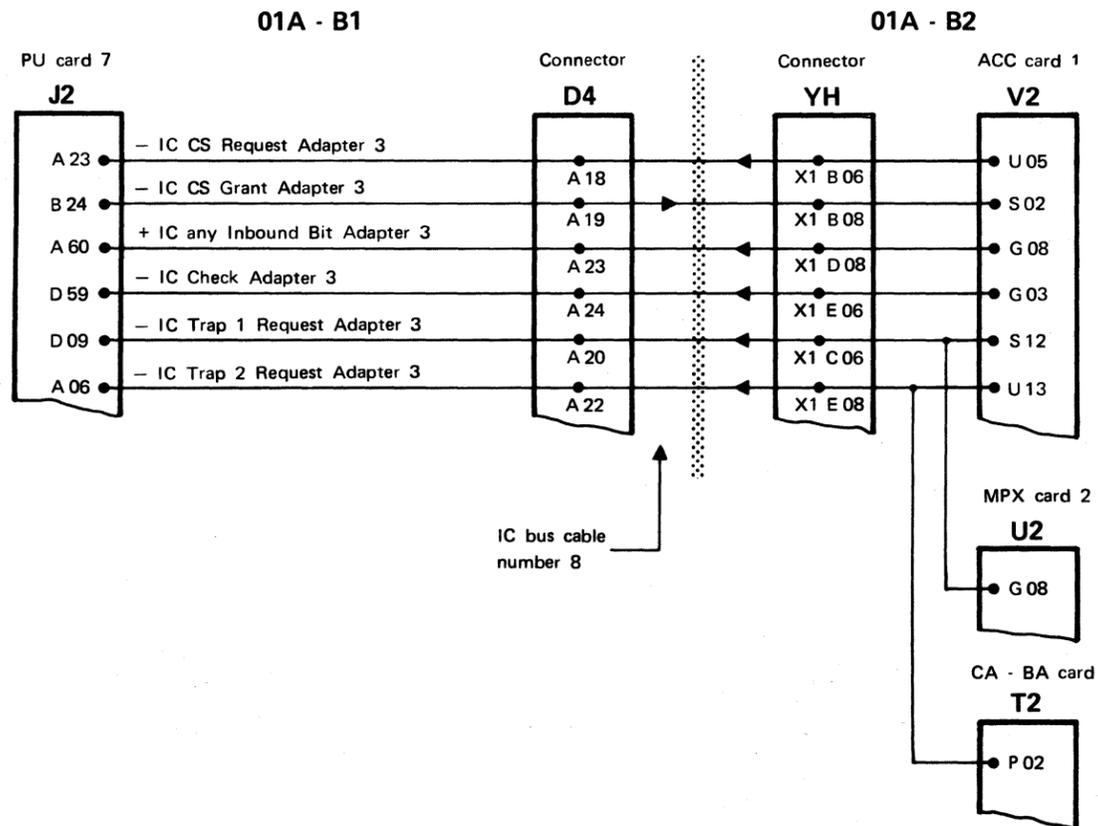
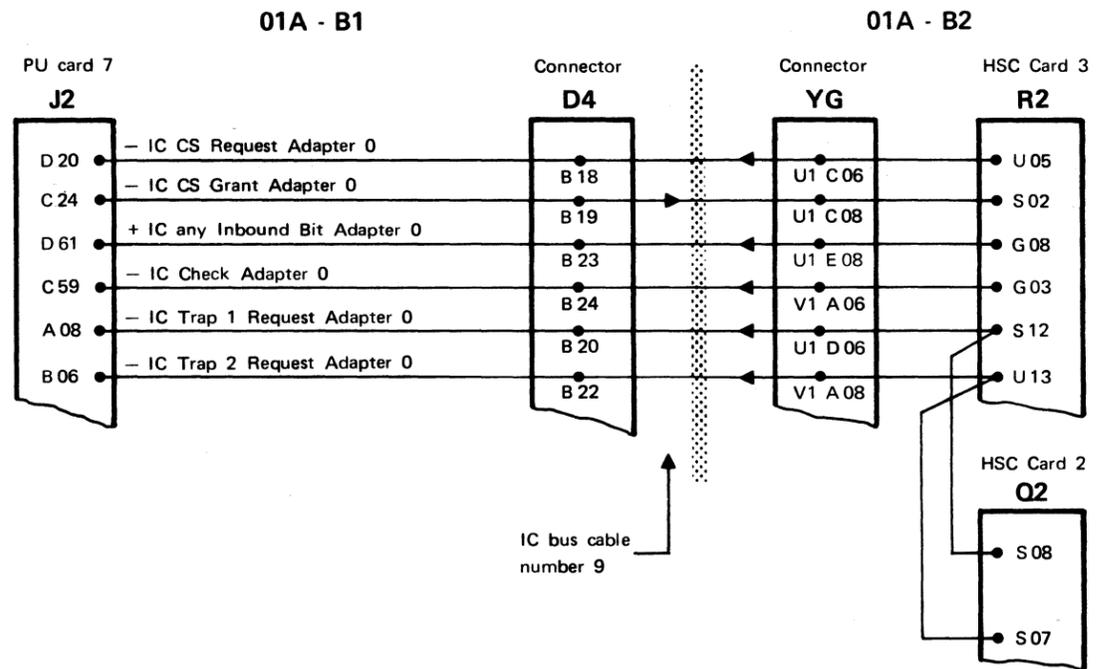
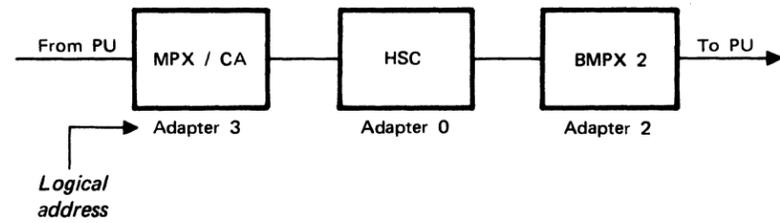
IC Bus 0 Star Lines

This page shows the star lines for version 1.



IC Bus 0 Star Lines (continued)

This page shows the star lines for version 3.



IC Bus 1

Signal Names of IC Bus 1 Cables

Cable Number 4

From	To	Signal Name
01A-A2*	01A-B1	
S1E13	B4D02	- IC Bus 1 Bit, P, 8-15
S1E11	B4D03	- IC Bus 1 Bit 8
T1A11	B4D04	- IC Bus 1 Bit 9
T1B13	B4D06	- IC Bus 1 Bit 10
T1C11	B4D07	- IC Bus 1 Bit 11
T1C13	B4D08	- IC Bus 1 Bit 12
T1D11	B4D10	- IC Bus 1 Bit 13
T1D13	B4D11	- IC Bus 1 Bit 14
T1E11	B4D12	- IC Bus 1 Bit 15
U1A13	B4D14	+ IC 1 Control 1
U1B11	B4D15	+ IC 1 Control 2
U1B13	B4D16	- IC 1 Control Parity
U1C11	B4D18	- IC CS Request Adapter 7
U1C13	B4D19	- IC CS Grant Adapter 7
U1D11	B4D20	- IC Trap 1 Request 7
V1A13	B4D22	- IC Trap 2 Request 7
U1E13	B4D23	+ IC Any Inbound Bit Adapter 7
V1A11	B4D24	- IC Check Adapter 7

* Connector YQ

Cable Number 5

From	To	Signal Name
01A-A2*	01A-B1	
V1E11	B4E04	- IC 1 Data Strobe
W1A13	B4E06	- IC 1 Control Strobe
W1B11	B4E07	- IC 1 Sense Gate
W1B13	B4E08	- IC Adapter Degate
W1E13	B4E14	- IC Bus 1 Bit P 0 - 7
X1A11	B4E15	- IC Bus 1 Bit 0
X1A13	B4E16	- IC Bus 1 Bit 1
X1B11	B4E18	- IC Bus 1 Bit 2
X1B13	B4E19	- IC Bus 1 Bit 3
X1C11	B4E20	- IC Bus 1 Bit 4
X1E13	B4E22	- IC Bus 1 Bit 5
X1D13	B4E23	- IC Bus 1 Bit 6
X1E11	B4E24	- IC Bus 1 Bit 7

* Connector YR

Cable Number 6

From	To	Signal Name
01A-B2	01A-A2	
A3D13	X3D13	- IC Bus Bit P, (8-15)
A3D03	X3D03	- IC Bus Bit 8
A3D05	X3D05	- IC Bus Bit 9
A3D06	X3D06	- IC Bus Bit 10
A3D07	X3D07	- IC Bus Bit 11
A3D09	X3D09	- IC Bus Bit 12
A3D10	X3D10	- IC Bus Bit 13
A3D11	X3D11	- IC Bus Bit 14
A3B10	X3B10	- IC Bus Bit 15
A3B12	X3B12	- IC Clock 5B
A3B13	X3B13	- IC Clock 10B
A3B06	X3B06	- IC Sense Gate
A3B05	X3B05	- IC Control Strobe
A3B09	X3B09	- IC Data Strobe
A3B08	X3B08	- IC Adapter Degate

Cable Number 7

From	To	Signal Name
01A-B2	01A-A2	
A2B12	X2B12	- IC Bus Bit P, (0-7)
A2D02	X2D02	- IC Bus Bit 0
A2B04	X2B04	- IC Bus Bit 1
A2D05	X2D05	- IC Bus Bit 2
A2D06	X2D06	- IC Bus Bit 3
A2D07	X2D07	- IC Bus Bit 4
A2D09	X2D09	- IC Bus Bit 5
A2D10	X2D10	- IC Bus Bit 6
A2D11	X2D11	- IC Bus Bit 7
A2B08	X2B08	- IC Control Bit 1
A2D13	X2D13	- IC Control Bit 2
A2B13	X2B13	- IC Control P

Cable Number 11

From	To	Signal Name
01A-B1	01A-B2*	
D4E14	N1C08	- IC Clock 5B
D4E15	N1D06	- IC Clock 10B

* Connector YE

Cable Number 12

From	To	Signal Name
01A-B1	01A-B2*	
B4C02	J1C08	- IC Bus 1 Bit P, 0-7
B4C03	J1C06	- IC Bus 1 Bit 0
B4C04	J1D06	- IC Bus 1 Bit 1
B4C06	J1E08	- IC Bus 1 Bit 2
B4C07	K1A06	- IC Bus 1 Bit 3
B4C08	K1A08	- IC Bus 1 Bit 4
B4C10	K1B06	- IC Bus 1 Bit 5
B4C11	K1B08	- IC Bus 1 Bit 6
B4C12	K1C06	- IC Bus 1 Bit 7
B4C18	L1A06	- IC CS Request Adapter 4
B4C19	L1A08	- IC CS Grant Adapter 4
B4C20	L1B06	- IC Trap 1 Request Adapter 4
B4C22	L1D08	- IC Trap 2 Request Adapter 4
B4C23	L1C08	+ IC Any Inbound Bit Adapter 4
B4C24	L1D06	- IC Check Adapter 4

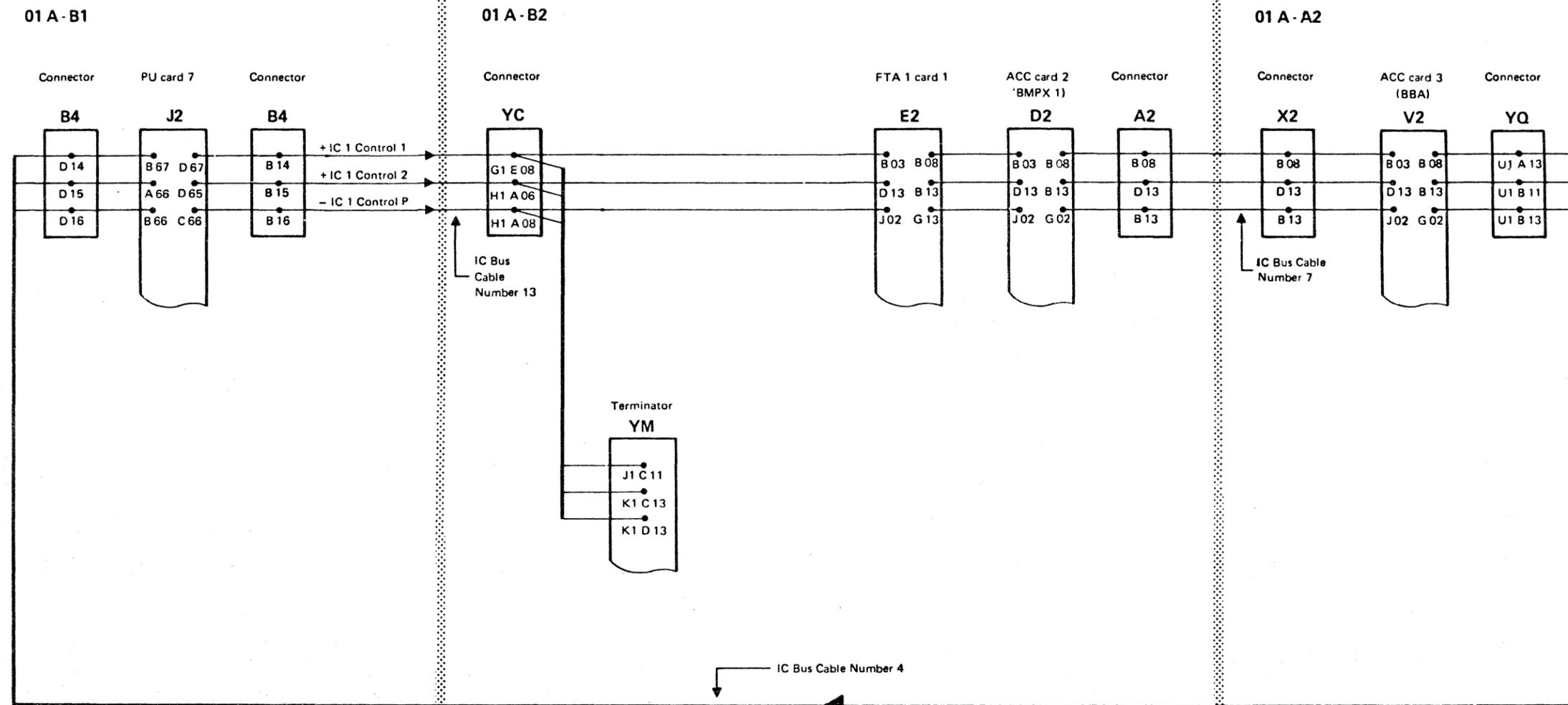
* Connector YD

Cable Number 13

From	To	Signal Name
01A-B1	01A-B2*	
B4B02	F1D08	- IC Bus 1 Bit P, 8-15
B4B03	F1D06	- IC Bus 1 Bit 8
B4B04	F1E06	- IC Bus 1 Bit 9
B4B06	G1A08	- IC Bus 1 Bit 10
B4B07	G1B06	- IC Bus 1 Bit 11
B4B08	G1B08	- IC Bus 1 Bit 12
B4B10	G1C06	- IC Bus 1 Bit 13
B4B11	G1C08	- IC Bus 1 Bit 14
B4B12	G1D08	- IC Bus 1 Bit 15
B4B14	G1E08	+ IC 1 Control 1
B4B15	H1A06	+ IC 1 Control 2
B4B16	H1A08	- IC 1 Control Parity
B4B18	H1B06	- IC CS Request Adapter 5
B4B19	H1B08	- IC CS Grant Adapter 5
B4B20	H1C06	- IC Trap 1 Request Adapter 5
B4B22	H1E08	- IC Trap 2 Request Adapter 5
B4B23	H1D08	+ IC Any Inbound Bit Adapter 5
B4B24	H1E06	- IC Check Adapter 5

* Connector YC

IC Bus 1 Ring Lines (continued)

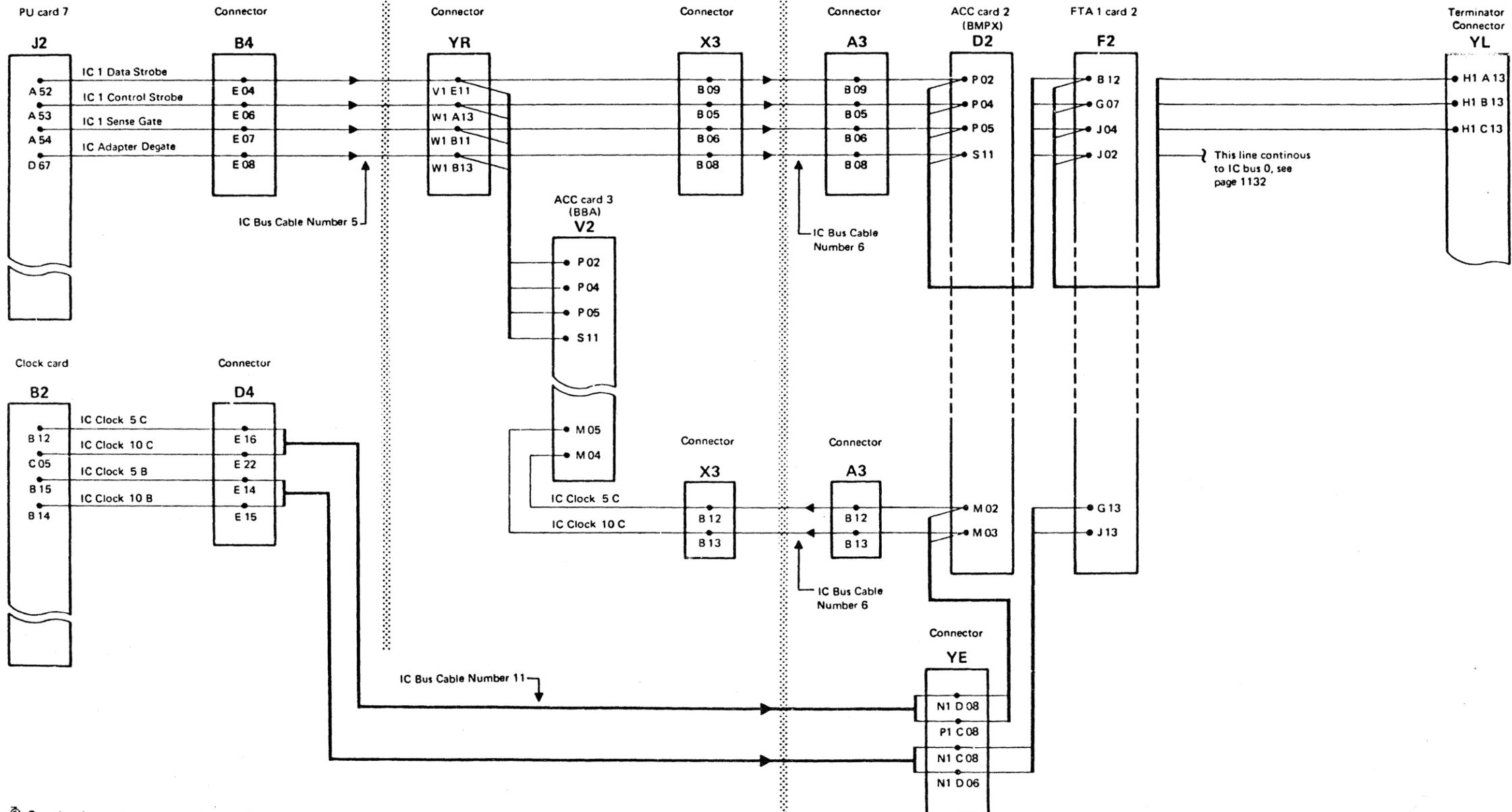


IC Bus 1 Stub Lines

Board 01 A - B1

Board 01 A - A2

Board 01 A - B2



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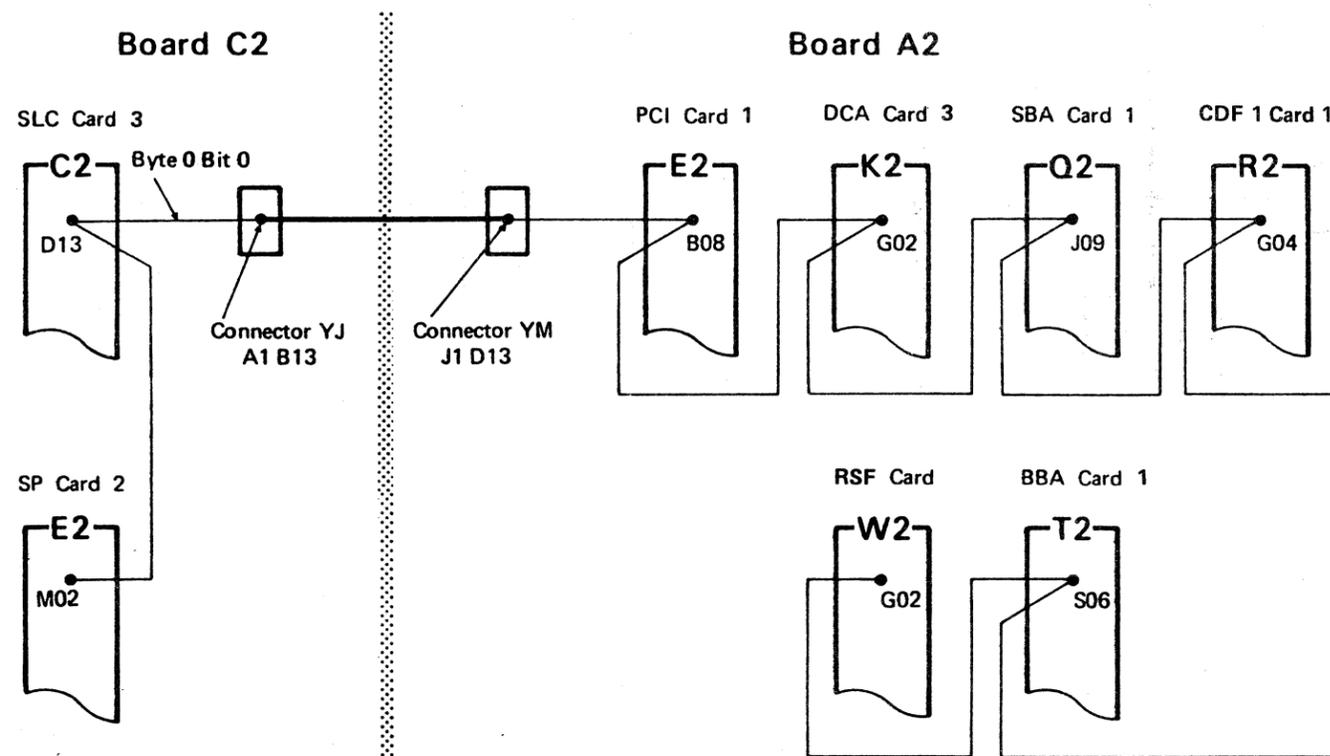
Pin Location Charts

Processor Bus (Bytes)	Location of Card		Processor	SCL Card 3	Connector	Connector	PCI	DCA Card 3	SBA	CDF Card 1	BBA 0	RSF
	C2 E2	C2 C2	C2 YJ	A2 YM	A2 E2	A2 K2	A2 Q2	A2 R2	A2 T2	A2 W2		
Byte 0 Bit 0	M02	D13	A1 B13	J1 D13	B08	G02	J09	G04	S06	G02		
Byte 0 Bit 1	P02	B12	A1 C13	J1 E13	D11	J02	B07	D13	S12	J02		
Byte 0 Bit 2	M03	B13	A1 D13	K1 A13	D10	D10	B13	J02	U10	D10		
Byte 0 Bit 3	P04	D10	B1 A13	K1 C13	B09	G08	B08	G02	U09	G08		
Byte 0 Bit 4	M04	D09	B1 B13	K1 D13	D06	J04	B09	J06	S10	J04		
Byte 0 Bit 5	M05	B10	B1 C13	K1 E13	B03	D09	G02	G07	S05	D09		
Byte 0 Bit 6	P05	D06	B1 D13	L1 A13	B10	B09	B10	G08	S07	B09		
Byte 0 Bit 7	P06	D07	C1 A13	L1 C13	D04	D06	G03	G03	U12	D06		
Byte 0 Bit P	P07	B03	C1 B13	L1 D13	B06	B02	G04	B12	S08	B02		
Byte 1 Bit 8	P09	U06	A1 C11	J1 E11	J13	G09	J10	D12	U05	G09		
Byte 1 Bit 9	M09	U04	A1 D11	K1 A11	J10	B07	J02/G06	J04	S09	J06		
Byte 1 Bit 10	M10	S04	A1 E11	K1 B11	G09	G07	G07	G09	U02	B07		
Byte 1 Bit 11	P10	S03	B1 A11	K1 C11	G08	J07	J04	J07	U07	J07		
Byte 1 Bit 12	P11	P09	B1 C11	K1 E11	G10	G10	J05	D10	U04	G10		
Byte 1 Bit 13	P12	M09	B1 D11	L1 A11	G06	J10/S08	J06	J09/M08	U13	J10		
Byte 1 Bit 14	P13	M08	B1 E11	L1 B11	J07	J11	J07	G05	S11	J11		
Byte 1 Bit 15	M12	M07	C1 A11	L1 C11	G05	J12	G08	J05	U11	J12		
Byte 1 Bit P	M13	S10	C1 B11	L1 D11	J06	G12	G09	B10	M13	G12		

Processor Cont. Lines	Location of Card		Processor	Processor	SCL 3	SCL 4	Connector	Connector	PCI	DCA Card 3	SBA	CDF Card 1	BBA 0	RSF	
	C2F2	C2E2	C2C2	C2B4	C2YK	A2YD	A2 E2	A2K2	A2Q2	A2R2	A2T2	A2W2			
Adapter to SP	Valid Byte	D04		D11		F1A11	L1D06	B12		U02	G07	G03			
	Valid Halfword	B09		B02/S12		E1C11	L1A06		J09	B05					
	IRR	B03		D12		E1D11	L1B06	B04	D02	J12	P10	G12	D02		
	Parity Valid	B12		U12		E1E11	L1C06	J04	D07	G05	U11	M04	D07		
	CSR	B04				C1E11	J1C06		S02		M05	B09			
	EOC	D09				D1C11	K1A06		M05		U13	P05			
	PIO Reset			G09	D10	E1A13	K1D08		J06	D09	S03	D04	J05		
	Restart	S08			J11										
	TA	D05		S13		E1C13	L1A08	G04	D05	D12	U06	G08	D05		
SP to Adapter	TC	B10		B04		E1E13	L1C08	G02		S05	G05	B08			
	TD	D11		G08		F1A13	L1D08	D13	B05	D13	U05	M11	B05		
	I/O Tag	G08	U09	U13		E1B13	K1E08	B13	B04	D04	S09	J09	B04		
	Halt	B07		M13		D1E13	K1C08	J02	G04	P11	P02	P07	G04		
	CSG	D10		D04	G04	D1B11	J1E06				U10				
	Byte Tag	B08				D1D11									
	CSG Pass DCA								B10		S10	J10			
	OSC Out	U02		S05		D1E11	K1C06			D11					

Note: Not all control lines of the Processor bus are used for each Adapter.

The following picture shows for example one bit of bus 0. All the other bits and control lines use the same way.



Pin Location Charts

Processor Bus (Bytes)	Location of Card		Connector	Connector	MFCU	SCL Card 1	IOC Card 4	LOOP * HPCA card
	BBA 1	A2 U2						
Byte 0 Bit 0	S06	T1 A08	T6 A04	P10	D13	M02	G02	
Byte 0 Bit 1	S12	T1 B08	T6 B04	U05	B12	P02	J02	
Byte 0 Bit 2	U10	T1 C08	T6 C04	M13	B13	M03	D10	
Byte 0 Bit 3	U09	T1 E08	T6 E04	P12	D10	P04	G08	
Byte 0 Bit 4	S10	U1 A08	U6 A04	P13	D09	M04	J04	
Byte 0 Bit 5	S05	U1 B08	U6 B04	M08	B10	M05	D09	
Byte 0 Bit 6	S07	U1 C08	U6 C04	M10	D06	P05	B09	
Byte 0 Bit 7	U12	U1 E08	U6 E04	S03	D07	P06	D06	
Byte 0 Bit P	S08	V1 A08	V6 A04	P11	B03	P07	B02	
Byte 1 Bit 8	U05	T1 B06	T6 B02	M09	U06	P09	G09	
Byte 1 Bit 9	S09	T1 C06	T6 C02	M12	U04	M09	J06	
Byte 1 Bit 10	U02	T1 D06	T6 D02	M06	S04	M10	G07	
Byte 1 Bit 11	U07	T1 E06	T6 E02	M11	S03	P10	J07	
Byte 1 Bit 12	U04	U1 B06	U6 A02	P07	P09	P11	B07	
Byte 1 Bit 13	U13	U1 C06	U6 B02	U04	M09	P12	J10	
Byte 1 Bit 14	S11	U1 D06	U6 D02	U02	M08	P13	J11	
Byte 1 Bit 15	U11	U1 E06	U6 E02	S04	M07	M12	J12	
Byte 1 Bit P	M13	V1 A06	V6 A02	S02	S10	M13	G12	

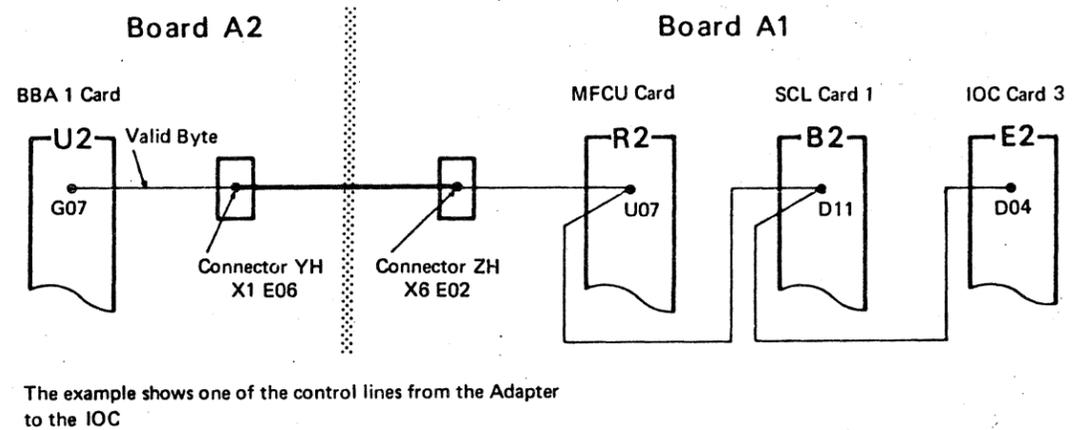
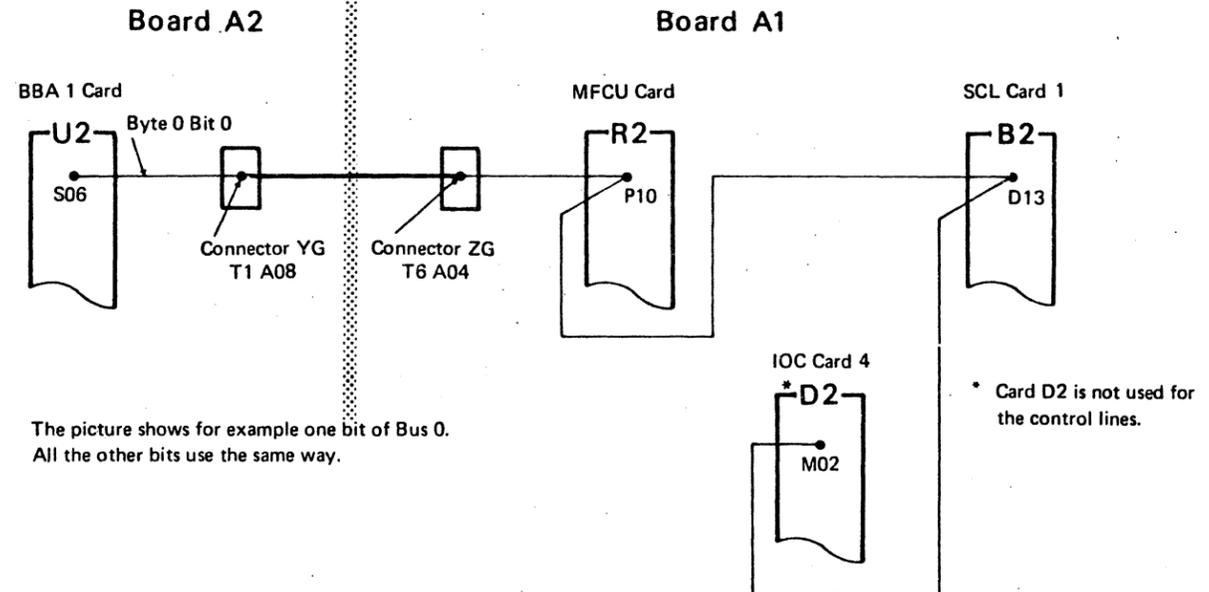
* Up to four HPCA may be installed

Processor Control Lines	Location of Card		Connector	Connector	MFCU	SCL Card 1	IOC Card 3	LOOP * HPCA card
	BBA 1	A2 U2						
Valid Byte	G07	X1 E06	X6 E02	U07		D04	G03	
Valid Halfword						B09		
I/O Exception						D2 U11		
IRR	G12	X1 C06	X6 C02	J12	D12	B03	D02	
Parity Valid	M04	X1 D06	X6 D02	U12	U12	B12	D07	
CSR	B09	V1 D06	W6 B04	S09			M13	
EOC	P05	W1 B06	W6 B02	S06		D09	P11	
Reset					G09	J02	J05	
Restart						S08		
TA	G08	X1 B08	X6 B04	S10	S13	D05	D05	
TC	G05	X1 D08	X6 D04	U09	B04	B10	B08	
TD	M11	X1 E08	X6 E04	U13	G08	D11	B05	
I/O Tag	J09	X1 A08	X6 A04	G10	U13	G08	B04	
Halt	P07	W1 A08	W6 D04	S08	M13	B07	G04	
CSG	J10	W1 D06		P02	D04	D10	P05	
Byte Tag						B08		

Note: Not all control lines of the I/O Subsystem are used for each adapters

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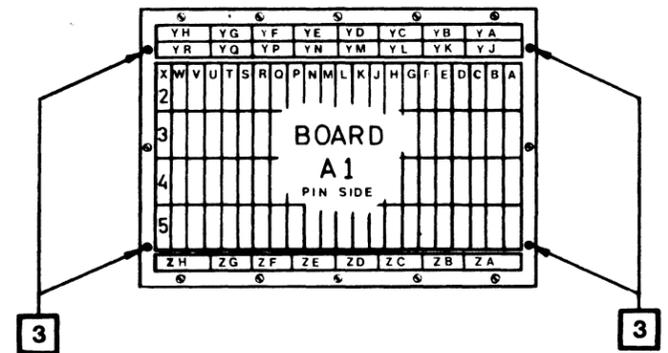
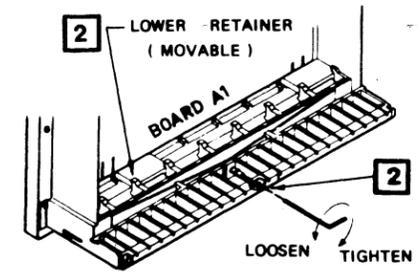
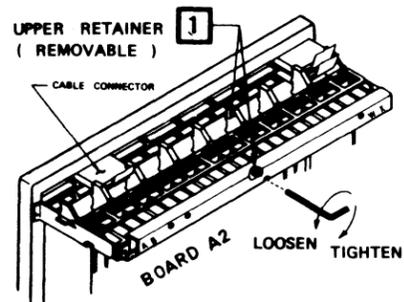
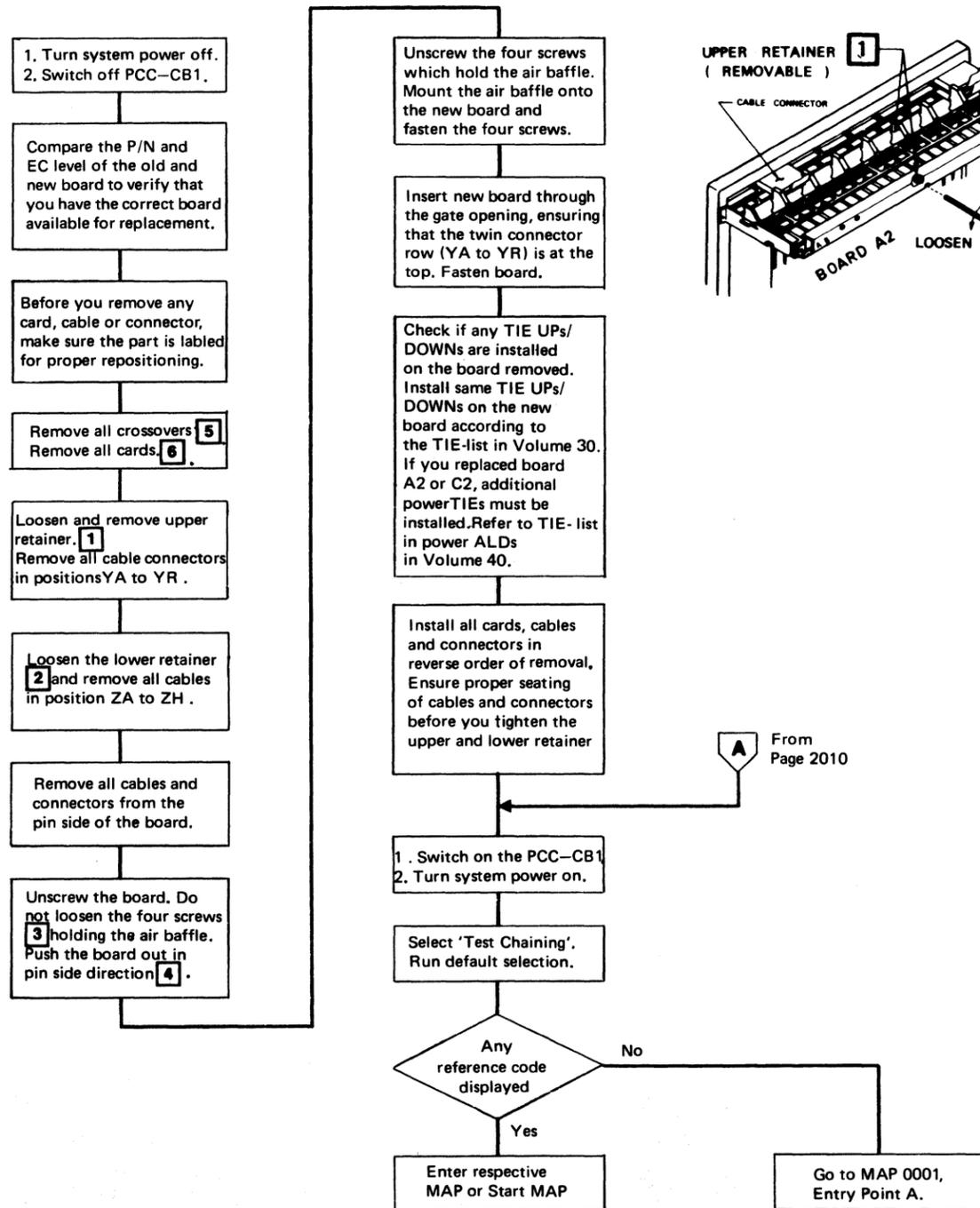


Supplement to MAPs, Section 2: REMOVALS and REPLACEMENTS

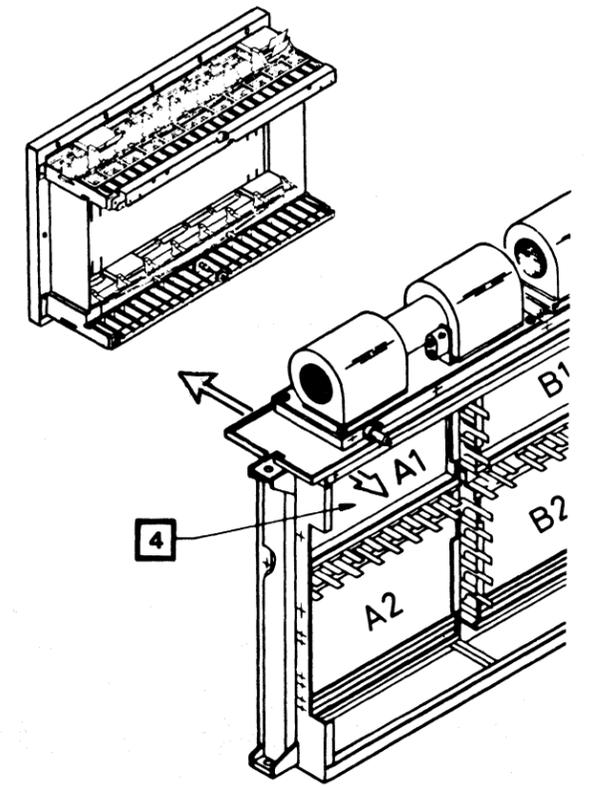
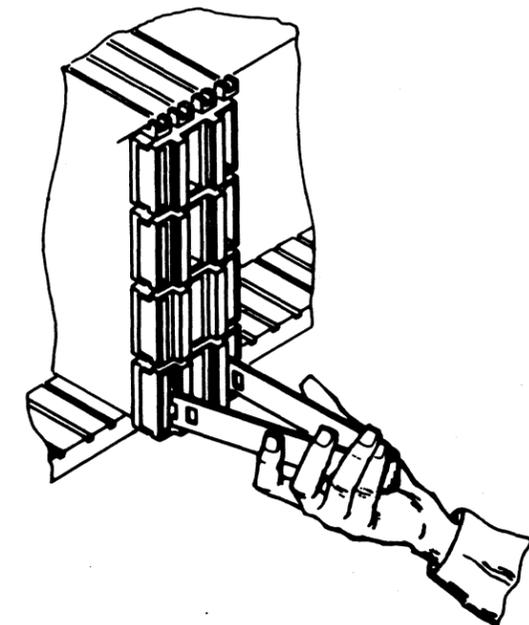
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22-Position Board Replacement



5 Crossover connectors can easily be removed using the extraction tool P/N 454065 (wire relay extraction tool).



6 To remove cards use extraction tool P/N2360375.

Supplement to MAPs, Section 3: ADJUSTMENTS

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In this system there are only adjustments needed for POWER. They are described in the POWER MANUAL.

Supplement to MAPs, Section 4: DIAGNOSTIC RUN PROCEDURES

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M/S Program-Handling Overview

The following tables show the available LOG, TEST, and TOOL programs with a summary of all handling prerequisites.

These tables are intended as a quick recall aid on how to set up a wanted program and how to terminate this program.

The handling prerequisites are indicated by an asterisk (*) in the respective columns.

Log Programs

This table shows the available log programs and the summary of their handling prerequisites.

A log is recorded on the diagnostic diskette only for SP machine check, SPIL program, Power, and IML.

Note 1: This log is only documented in the Field Support Center documentation.

Note 2: For power logs and ambient recording logs refer to the Power Manual in Volume 16.

Note 3: For CA unit check log refer to the CA Section in Volume 14.

Note 4: For loop adapter log refer to the Loop Section in Volume 15.

LOG PROGRAMS		SETUP							TERMINATION									
Selectable from M/S PROGRAM SELECTION menu	Page reference	Control diskette	Diagnostic diskette		PWR complete light		IML complete	CE mode switch on	Vary off line		Manual stop required	Re-IML required		Copy config progr	Cancel key	Vary on line	Runtime (min)	
		V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Log mode	4030	*	*															
Erase selective log	4032	*	*															
Erase all logs	4034	*	*															
Stop before log	4036	*	*	*	*													
Disable channel logs	4030	*	*	*	*													
Enable channel logs	4030	*	*	*	*													
Reference code log	4040	*	*															
Detailed log display	4050	*	*															
PU trace log	Note 1	*	*															
Power log	Note 2	*	*															
SP machine check log	4070	*	*															
PU stop log	4080	*																
PU program log	4090	*																
BBA 0/1 log	4100	*																
MPX/BMPX/HSC log	4110	*																
Ambient recording log	Note 2	*																
IOC log	4120	*																
IC bus log	4130	*																
FTA log	4140	*																
Loop adapter log	Note 4	*																
CA unit check log	Note 3	*	*															
SPIL program log	4160	*	*															
IML log	4170	*	*															
Last detailed log	4180	*	*															
Refcode analysis	4200	*		*	*													

Test Programs (continued)

Note 1: For power test description refer to the Power Manual in Volume 16.

Note 2: These tests are described in the CA Section of Volume 14.

Note 3: These tests are described in the MFCU Section of Volume 14 for 5424 in Volume 15 for the loop.

Note 4: If the functional code occupies two diskettes, the inline tests reside on the second diskette. You are prompted to change diskettes after selection of inlines.

Note 5: Run IC-bus test.

Note 6: Run IC-bus test, then the ACC/SCA (MPX/BMPX) test.

Note 7: Do not run other tests concurrent to the 'disk/tape inline' tests.

Note 8: Running time depends on environmental conditions.

Note 9: Perform IML with DIAG diskette inserted before selected this test.

TEST PROGRAMS	Page reference	SETUP							TERMINATION					
		Control diskette	Diagnostic diskette	PWR complete light	IML complete	CE mode switch on	Vary off line	Jumper/plug Previous test run	Manual stop required	Re-IML required	Copy config progr	Cancel key	Vary on line	Runtime (min)
Selectable from M/S PROGRAM SELECTION menu Selection offered in the selected menu	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Disk/tape inline 3310 3370 3340 3344 8809	4400	Note 4	*	*	*	*	*	*	Note 7	*	*	*	*	Note 8
CA inline Inline tests Trace/dynamic display Line exerciser	Note 2	*	*	*	*	*	*	*						
Test chaining	4325		*	*						*				

Log Mode Selection

Log Handling - Actions

The picture **A** appears on the screen when you select 'LOG MODE' from the 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'. This menu offers five selections which are described briefly below. For handling refer to the following pages.

- (A) Erase Selective Log**
Erases the reference code log of a selected unit and, if available, the detailed log of this unit. See table in right column.
- (B) Erase all Logs**
Erases all detailed log areas and the reference code log area.
- (C) Stop before Log**
This mode immediately stops the processing unit as soon as an error is detected in a selected unit. The units for which this can be applied are listed on screen.
- (D) Disable Channel Logs**
If this selection is entered, any logs from MPX/BMPX are suppressed to allow scoping on the standard interface or control unit. A message is displayed on line 23 as long as this mode is active.
- (E) Enable Channel Logs**
This selection resets selection **(D)**, thus allowing all logs to be recorded. This is the normal status.

Log Handling - Results

A

```

4331 LOG MODE SELECTION
UNIT = TYPE
          ↑
          (K)
(A) 1 = ERASE SELECTIVE LOG   SELECT UNIT
(B) 2 = ERASE ALL LOGS
(C) 3 = STOP BEFORE LOG      SELECT UNIT
(D) 4 = DISABLE CHANNEL LOGS
(E) 5 = ENABLE CHANNEL LOGS

CONFIGURATION INDEX: <-- (F)

ACTION DONE
          ↑
          (J)
SELECTION: ↑
          (H)

RESTART=PF4
          ↑
          (G)

ANSWER
          ↑
          (G)
    
```

- (F)** This information is used as instructed by the MAP E680.
- (G)** After selection of **(A)** to **(E)** you may return to this picture by pressing PF4.
- (H)** Enter field for selection code.
- (J)** This message is displayed after selection **(D)** or **(E)** is executed.

(K)	Unit	Meaning
	TRAC = 01	Pu Trace Log
	IC = 2X/3X	IC-Bus
	PU = 49/4B	Processing Unit
	BMPX = 80	Block Multiplexer Channel 1
	BPX2 = 81	Block Multiplexer Channel 2
	HSC = 82	High Speed Channel
	MPX = 84	Multiplexer Channel
R	CA-C = 88	CA Channel Check
	CA-U = 89	CA Unit Check
	IOC = A0	I/O Controller
	BBA1 = A2	Bus to Bus Adapter 1
	Loop = A8	Loop Adapter
	FTA1 = C4	File/Tape Adapter 1
	FTA2 = C5	File/Tape Adapter 2
	FTA3 = C6	File/Tape Adapter 3
	IML = E0	Initial Microprogram Load
R	TIMR = E1	Timer Check
R	PUPS = E4	PU Program Check Stop Log
	AMBI = E8	Ambient Recording
	PUPR = EA	PU Program Check Log
	SPMC = F0	SP Machine Check
	BBA0 = F2	Bus to Bus Adapter 0
	SPIL = F5	SP Interpreter Log
	POWR = F7	Power
	3278 = F9	Device Cluster Adapter
R	LOG = FC	Error during log-in

Type of log or unit which caused a log.
 First two digits shown in the reference code.
 Abbreviation used in the screen display.
 R = Only a reference code is stored (no detailed log available).

Reference Code Log

Log Handling - Actions

Prerequisites:

- None

How to Select the Log

1. Call M/S PROGRAM SELECTION.

Hold down ALT key and press DIAG key. **A**

2. Key in selection for 'REFERENCE CODE LOG', press ENTER. **B**

This selection causes the display LOG DISTRIBUTION STATISTIC to be displayed first. With PF5 the REFERENCE CODE LOG DISPLAY can then be called.

Caution:

Whenever a non empty log area is erased, the log distribution is also cleared.

Communication adapter unit check logs and ambient recording logs are not stored in the 'reference code log' and the 'log distribution statistic'. They can only be displayed with 'Detailed Log Display' selection.

How to Terminate the Log Display

Press ALT key and press DIAG key. The 'IBM M/S Program Selection' is displayed on the screen.

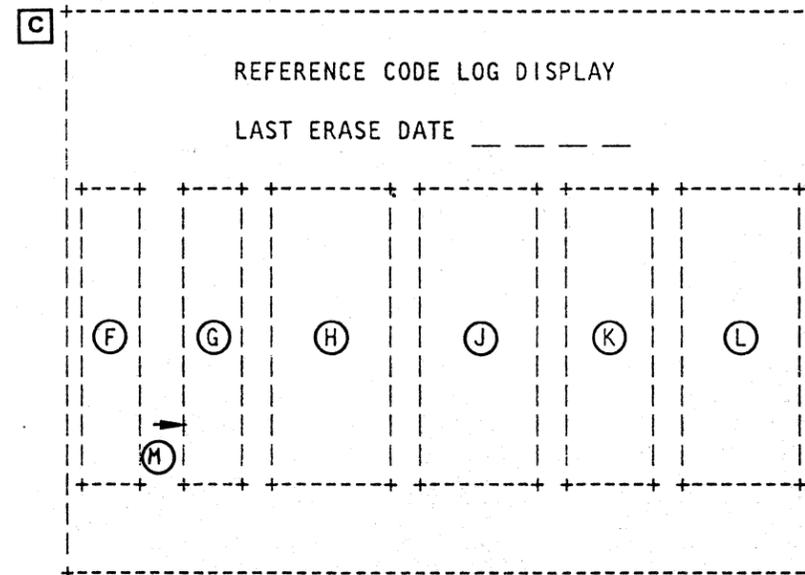
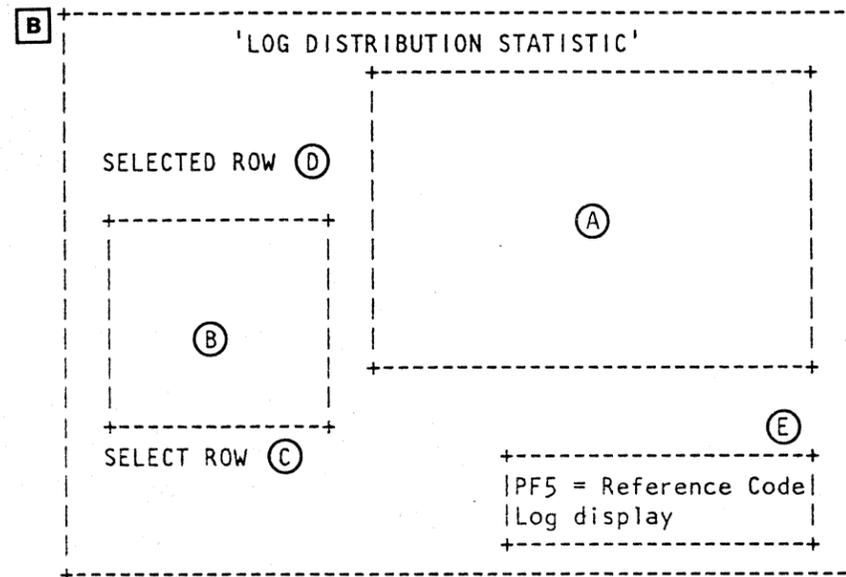
For the following log types there is no detailed log available. Only a reference code log is stored.

- CA channel check log
- PU program stop log
- Timer log
- Error during log - in
- DCA device log

Log Handling - Results

Screen displays:

A IBM MAINTENANCE AND SERVICE PROGRAM SELECTION



- A** See picture **A** in example on next side
- B** Selection of any row in **A**
- C** Indication what row in **A** is selected.
- D** To display all logged reference codes, press PF5. You get the picture 'REFERENCE CODE LOG DISPLAY' **C**

- F** Address of the reference code(s) logged.
- G** Name of the unit.
- H** Reference code.
- J** Additional information (Reference code extension).
- K** The count shows how often this log had occurred.
- L** Time and date of recorded log.
- M** The arrow points to the last log.

SP Machine Check Log Display

Log Handling - Actions

Prerequisites:

- Control or diagnostic diskette inserted.

How to Select the Log

- Call M/S PROGRAM SELECTION.
Hold down ALT key and press DIAG key. **A**
- Key in selection for 'DETAILED LOG DISPLAY',
press ENTER. **B**
- Key in selection for SP Machine Check log display,
press ENTER. **C**

How to Terminate the Log Display

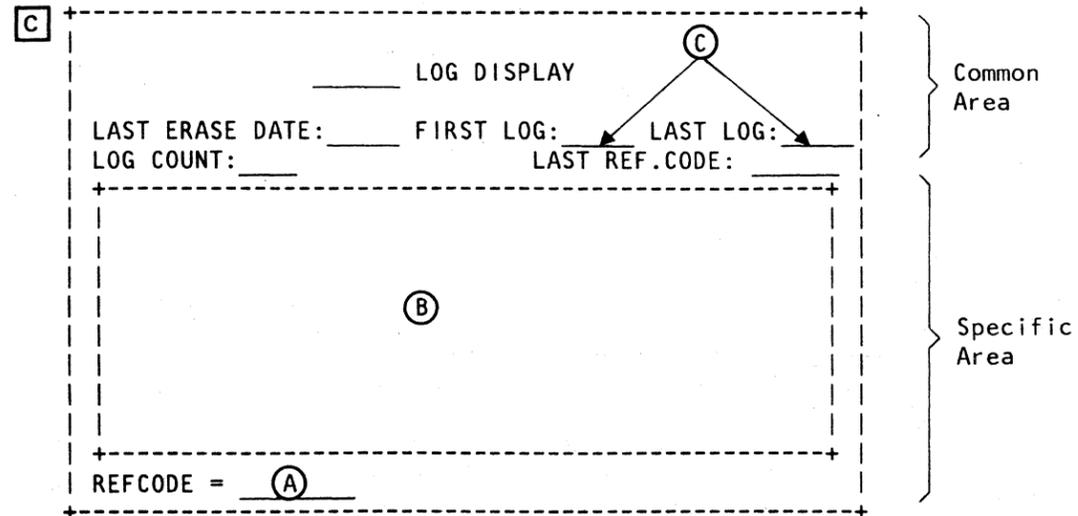
Hold down ALT key and press DIAG key. The 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION' is displayed on screen.

Log Handling - Results

Screen displays:

A 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'

B 'DETAILED LOG DISPLAY SELECTION'



- A** This reference code corresponds to the data in field. **B**
- B** Hardware data to be used in case of support.
- C** No time of occurrence is recorded for this log.

MPX/BMPX, HSC Log Display

Log Handling - Actions

Prerequisites:

- Control diskette installed

How to Select the Log

- Call M/S PROGRAM SELECTION.
Hold down ALT key and press DIAG key. **A**
- Key in selection for 'DETAILED LOG DISPLAY',
press ENTER. **B**
- Key in selection for 'MPX/BMPX LOG', press EN-
TER.
This picture offers in its lower part the appropriate
selection for MPX, BMPX, and HSC.
- Key in selection for the log to be displayed, for ex-
ample: BMPX1 **C**

How to Terminate the Log Display

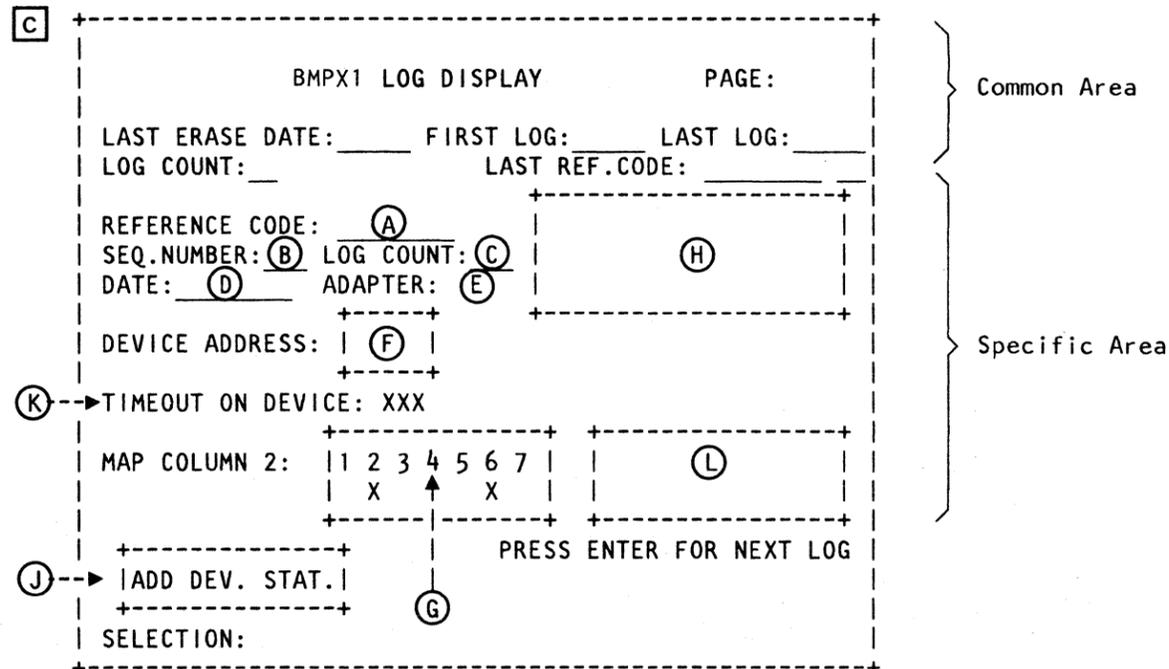
Hold down ALT key and press DIAG key. The 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION' is displayed on screen.

Log Handling - Results

Screen displays:

A 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'

B 'DETAILED LOG DISPLAY SELECTION'



- A** This reference code corresponds to the data displayed in field **H**.
- B** This is the log sequence number of the specific reference code **A**. The logs are numbered per adapter in the sequence of their occurrence.
- C** If one and the same log came up more than once, only the count is updated. This shows how often the same error occurred.
- D** The date when the reference code **A** occurred.
- E** Displays the status of the adapter e.g. STOPPED.
- F** This shows the device address of the erroneous control unit connected to the standard interface.

- G** These seven digits are used additionally within the MAPs for further decision which FRU(s) to replace.
- H** Hardware data to be used in case of support.
- J** The last 32 device addresses are displayed here, four at a time.
With PF5 the next four addresses are displayed. The device address with the highest count is displayed first. The count can be from 01 to 15.
- K** This message appears when an adapter timeout was detected. This may happen when a read is attempted on a blank tape on device XXX.
- L** The standard interface is displayed here.

IC-Bus Log Display

Log Handling - Actions

Prerequisites:

- Control diskette inserted

How to Select the Log

1. Call M/S PROGRAM SELECTION.
Hold down ALT key and press DIAG key. **A**
2. Key in selection for 'DETAILED LOG DISPLAY',
press ENTER. **B**
3. Key in the selection for 'IC-BUS (DM) LOG', press
ENTER. **C**

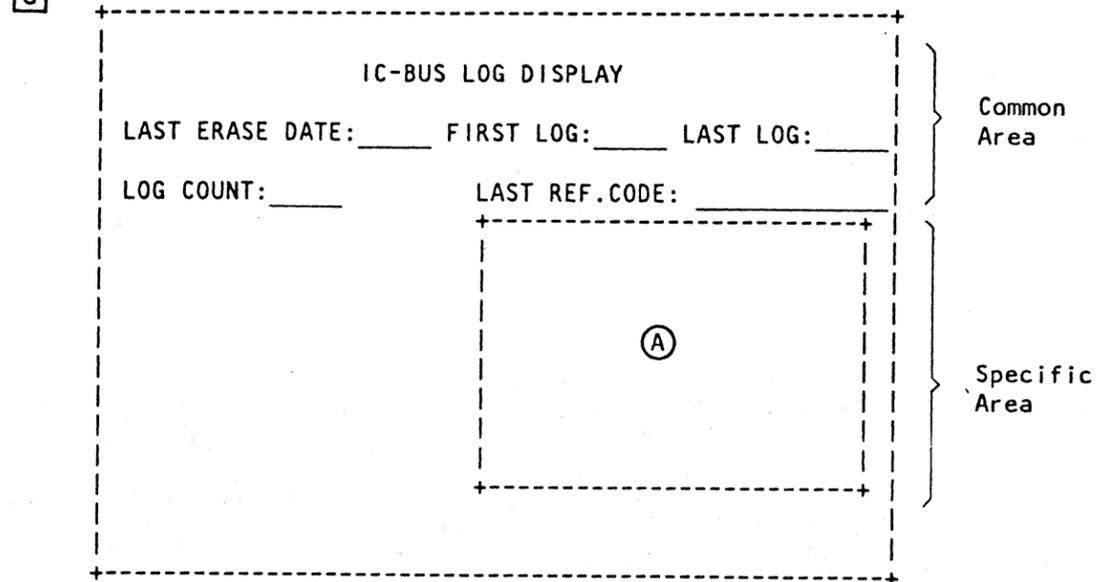
How to Terminate the Log Display

Press ALT key and hold and press DIAG key. The 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION' is displayed on screen.

Log Handling - Results

Screen displays:

- A** 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'
- B** 'DETAILED LOG DISPLAY SELECTION'
- C**



Explanation of the Specific Area:

- A** Hardware data to be used in case of support.

FTA Log Display (continued)

Log Handling - Results

D LV: 80267133 FTA-1 LOG DISPLAY PAGE: 0001
 LAST ERASE DATE: 10/02 12:54 FIRST LOG: 10/02 13:03 LAST LOG: 10/02 13:40
 LOG COUNT: 000003 LAST REF.CODE: C430F001 00000000

REFERENCE CODE: CA 30F0 01 <--- **(A)**

ADPT: TRAP STOP CTL: 0004

SEQ. NO. -- SYMPTOMS --	0..: 23020200 450E8A66 77787777 000068A0
003 = 30F0	16.: 08C20308 08C866FF 000E8A21 30000091
002 = 30F0	32.: 18DCF4A0 3002C4D2 E5E6FFFF 0001FFE5
001 = 30F0	48.: D50F90DB 1826008D 48420204 00008001
=	64.: 23030000 00000000 00000000 00000000

CHK.: PSO CRG ALU PPC SPC PXC SXC SYN FCO
 CNT.: 000 000 000 000 000 000 000 000 000 000

SELECTION: 2108

4MB VSE TIMER: ON DATA: ADDR:
 TOD: SEC

PRESS ENTER COMP/3340 DA LOG <--- **(E)**

Common Log Area

Specific Log Area

E LV: 80011034 COMP FEAT/3340 DIR ATTACHM LOG DISPLAY,FTA-1 PAGE: 0002
 LAST ERASE DATE: 02/15 11:11 FIRST LOG: 02/15 11:13 LAST LOG: 02/15 11:15
 LOG COUNT:000005 LAST REF.CODE: C4307001 00000000

LAST REF.CODE: C400DA01 01009180

ADDR: 0/32--- 4/36--- 8/40--- 12/44--- 16/48--- 20/52--- 24/56--- 28/60---
 00-31: D6258FB9 CA932F34 FF4202FF 42010000 10000100 40010010 880961ED 00010783
 32-63: 1E010000 80009180 00000000 00000000 00000000 00000000 00000000 00000000

LAST-1 REF.CODE: C400DA01 01009180
 00-31: D6258FB9 CA34EEE8 FF4202FF 42010000 10000100 40010010 880961ED 00010783
 32-63: 1E010000 80009180 00000000 00000000 00000000 00000000 00000000 00000000

LAST-2 REF.CODE:
 00-31:
 32-63:
 LAST-3 REF.CODE:
 00-31:
 32-63:

SELECTION: 2108

370 TIMER: ON DATA: ADDR:
 TOD: SEC

PRESS ENTER FOR FTA LOG

These two bytes have the same contents as byte 38, 39. They show the FSI code.

- (A)** This reference code corresponds to the data in the specific area.
- (B)** This area shows all the symptoms which were collected for the error. The first symptom from left in the top row is included in the reference code.
- (C)** This field shows the log sequence number.
- (D)** This field shows 80 bytes of data. Byte 62, bit 0 = address valid bit. Byte 63 contains the address of the last used device. All other data has to be used in case of support only.
- (E)** Pressing ENTER causes a second page to be displayed. This page, if not empty, displays either compatibility log or functional adapter log (3340) information. **(E)**

This display shows log data of the last four logs which have occurred. 64 data bytes are displayed for each log.

Byte 12 = DASD adapter number and channel address
 13 = Device address

Byte	Meaning
0-11, 15	All these bytes are only used for support cases.
14	Bit 0 = 0 indicates a functional adapter log. = 1 indicates a compatibility feature log.
12, 13	See highlight in picture (E)
16-39	Contain the sense bytes for the functional adapter log or the compatibility log. The meaning of these bytes is explained in the appropriate I/O manual (3340, 3310, 3370).
40-63	For explanation refer to the FSC documentation.

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intentionally left blank

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IML Log Display

Log Handling - Actions

Prerequisites:

- Control diskette or diagnostic diskette inserted.

How to Select the Log

- Call M/S PROGRAM SELECTION.
Hold down ALT key and press DIAG key. **A**
- Key in selection for 'DETAILED LOG DISPLAY',
press ENTER. **B**
- Key in the selection for 'IML LOG', press ENTER.
C

How to Terminate the Log Display

- Press ALT key and hold and press DIAG key. The
'IBM MAINTENANCE AND SERVICE PROGRAM
SELECTION' is displayed on screen.

Log Handling - Results

Screen displays:

A 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'

B 'DETAILED LOG DISPLAY SELECTION'

C

IML LOG DISPLAY		} Common Area
LAST ERASE DATE: _____	FIRST LOG: _____ LAST LOG: _____	
LOG COUNT: _____	LAST REF. CODE: _____	} Specific Area
ⓓ		
SELECTION: . L=LAST LOG, P=PRECEDING LOG, M=MOST FREQUENT		
ⓐ	ⓑ	ⓒ

Explanation of the specific area:

- A** By entering 'L' the hardware data in the specific area **D** belong to the last log.
- B** By entering 'P' the hardware data in the specific area **D** belong to the log before the last one.
- C** By entering 'M' the hardware data in the specific area **D** belong to the most frequent log.
- D** Hardware data for use in case of support.

Integrated Reference Code Analysis (IRECA)

Purpose

The Integrated Reference Code Analysis program will assist the 4331 CE on his way through the MAPs. It will minimize the time required to determine the failing FRU. It also allows immediate and simple update of the decision tables.

Restrictions

The IRECA program analyses only reference codes which lead to the analysis result without the need for manual intervention, for example: it is not possible to respond to questions. It also requires a functional 4331 Support Processor for execution. Reference Codes other than the Last Log reference code must be typed in manually.

- Warning:
- Results may be wrong if the reference code or symptom code is entered incompletely, or if the refcode entered was not generated by this machine.
 - In case of multiple SYMPTOM Codes enter only one at a time together with the refcode.

Screen Layout

The 20 basic lines of the screen display are arranged as follows:

TITLE	
(A) INPUT AREA	MAP TYPE
(B) PREREQUISITE INSTRUCTIONS	FRU (C)
(D) VERIFICATION INSTRUCTIONS	DISPLAY AREA
(E) HANDLING MESSAGES	
(F) SELECTION MENU	

- (A) This field shows the title of the selection, the MAP number and FIX number, and two input fields for the reference code and symptom code if available.

- (B) This field informs you about the necessary prerequisites. For example: logs which should be inspected first or tests which should run first. Instructions in this field must be executed before any FRU is replaced.
- (C) This field lists all suspected FRUs in their sequence of priority. Only 10 FRUs can be displayed in one frame. Press ENTER to display the next frame. All input fields are locked in this case until all FRUs have been displayed. Only the FRUs which are physically installed in this machine are displayed.
- (D) This field tells you how to proceed after FRU replacement. If not otherwise instructed go to the Exit MAP 0001.
- (E) This field may display additional messages.
- (F) This field lists the PF-selections available for this screen.

Example of an IRECA Display

```

INTEGRATED REFERENCE CODE ANALYSIS
REFERENCE CODE: F2028001      (SYMPTOM CODE): .....
*** PREREQUISITE INSTRUCTIONS: ***      MAP: F200      FIX: 1004
CHECK TOP CONNECTORS OF SUSPECTED FRUS.      SUSPECT:...
BEFORE FRU REPLACEMENT GO TO ENTRY POINT
B of MAP F200.
1. CARD 01A-A2T2
2. CARD 01A-C2D2
3. CARD 01A-C2E2
4. CARD 01A-C2F2
5. CARD 01A-C2G2
6. CARD 01A-C2H2
7. CARD 01A-C2J2
8. CARD 01A-C2C2
9. CARD 01A-C2B4
10. CARD 01A-A2R2
*** VERIFICATION INSTRUCTIONS ***
(A)->MORE... (PRESS ENTER)
====> CHECK THE INFO-BOX <====
PF1 = IRECA PF2 = INFOBOX PF3 = REF-UPDATE PF4 = FRU-UPDATE PF5 = MSG-UPDATE
MAN          4MB VSE TIMER: ON          DATA: 0000 ADDR: 000000
A00C
    
```

- (A) MORE... = Indicates that not all suspected FRU's are displayed. Press Enter to display next screen with the remaining FRU's.

IRECA - Info Box Selection

Screen Layout

Example of an Info Box Letter

```
INTEGRATED REFERENCE CODE ANALYSIS
*** INFO-BOX ***

THIS IS NUMBER 01 OF 04 LETTERS IN THE INFO-BOX.

IT IS FROM C.BROWN..... DATED 11/07/80 FOR REFERENCE CODE F2028001.

====> THE ERROR IS HIGHLY INTERMITTENT! TODAY I REPLACED FRUS 1
      THROUGH 5. IF ERROR PERSISTS CHANGE NEXT 5.
                                     <====

PF1 = IRECA  PF2 = INFOBOX      PF6 = WRITE A LETTER  PF7 = ERASE THIS LETTER
```

Purpose

The INFO-BOX is intended to serve the CE as a reminder stored on the diskette. Its main usage will be on intermittent errors or deferred maintenance when it is necessary to leave information for the same or another CE on a particular problem. The info box can hold up to ten letters.

How to Call the Info-Box

1. Select REFCODE ANALYSIS from the MAINTENANCE AND SERVICE PROGRAM selection menu.
2. Press PF2 key to select INFO BOX
3. After selection the first (oldest) letter is automatically displayed. Pressing the ENTER key will scroll the display to the next letter. When no more letters are stored the display will wrap back to the first letter.

Selection Menu

The selection menu is displayed in the bottom line. Two additional subselections and a scroll function are available for this selection.

PF6 = Write a letter
PF7 = Erase this letter

ENTER = scroll to next letter

How to Write a Letter

Press PF6 to write a letter. The program will unprotect the input area (224 characters) between the symbols ==> and <==. Any text may now be written. The letter will be stored by pressing the ENTER key. Then the program switches back immediately to display mode.

How to Erase a Letter

Display the letter to be erased. Press PF7 to erase this letter. The remaining letters will automatically close the gap and the freed space is now available for a new letter. Then the program switches back to display mode.

Messages

Message	Reason
** THE INFO-BOX IS FULL, ERASE A LETTER BEFORE YOU WRITE A NEW ONE **	Press ENTER until the letter is displayed you want to erase. Press PF7 to erase the letter.
THE LETTER IS STORED	Prompting message
THE LETTER IS ERASED	Prompting message

Selection Menu

There are four subselections available. The selection menu can be displayed by entering a '?' behind SELECT MODE. The available selections are:

A = ALTER A REFERENCE CODE
 D = DISPLAY REFERENCE CODE UPDATES
 E = ERASE ONE SELECTED UPDATE
 F = ERASE ALL UPDATES

The REFCODE UPDATE menu is displayed whenever an invalid selection was done.

How to Enter a Refcode Update

1. Enter subselection 'A' for ALTER and press ENTER.
2. Type in the variables as received from the support function.
 IMPORTANT: Type in the 4-digit key. This key will not be displayed.
3. Press ENTER to store the variables. The update is available now.

How to Update via RSF

Refer to page 4516 'Temporary Storage and Display of Data Bank Information', and page 4517 'How to Install a IRECA Update or MCTF Received from the Data Bank'.

Messages

Message	Reason
ENTER REF.CODE (AND SYMPTOM CODE)..	Subselection D entered for DISPLAY. Enter info to display the wanted update. Default: displays all updates.
	Subselection E entered for ERASE. Enter info for the update to be erased. No default available.
ALTER NOW...	Subselection A entered for ALTER. Key in the complete update received from the support function.

** INCORRECT KEY **	There is a typing error.
** PARAMETER MISSING OR INVALID **	- MAP, or FIX missing. - FIX not numeric. - Wrong message parameter. (Cursor points to the beginning of the incorrect field.)
** INVALID NUMBER (NOT 0..254) **	Wrong FRU number. (Cursor points to the beginning of the incorrect field.)
** INVALID REFERENCE/SYMPTOM CODE **	- Refcode missing. - Refcode/symptom not hex or characters other than . X or blank.
** UPDATE AREA OVERFLOW **	Get diskette with higher level.
** DISKETTE ERROR **	An unrecoverable diskette error was detected. Try again with another diskette. If the error persists use the 53FD diagnostics for problem analysis.
** UPDATE NOT FOUND **	May occur during DISPLAY or ERASE.
** UPDATE COMPLETED **	The update was correctly stored.
UPDATE IN PROCESS...	Wait for completion.
** SORRY, NO UPDATE STORED **	In response to selection DISPLAY.
** ALL UPDATES DISPLAYED **	End of the updates was reached.
** UPDATE ERASE COMPLETED **	After ERASE or ERASE all.
==> TO. ERASE PRESS PF9 <==	Prompting stop.

Messages

Messages	Reason
** ENTER THE WANTED FRU NUMBER **	Subselection D entered for DISPLAY. Enter FRU number to display the correct update. Default: Display all updates.
	Subselection E entered for ERASE. Enter FRU number for the update to be deleted. No default.
ALTER NOW...	Subselection A entered for ALTER. Key in the complete update received from the support function.
** INCORRECT KEY **	There is a typing error.
** PARAMETER MISSING OR INVALID **	- Update incomplete - Non hex in feature field - Invalid type - Invalid location (Cursor points to beginning of the incorrect field.)
** INVALID NUMBER (NOT 0..254) **	Wrong FRU number. (Cursor points to beginning of the incorrect field.)
** UPDATE AREA OVERFLOW **	Get diskette with higher level.
** DISKETTE ERROR **	An unrecoverable diskette error was detected. Try again with another diskette. If the error persists use the 53FD diagnostics for problem analysis.
** SELECTED UPDATE NOT FOUND **	May occur in response to selection DISPLAY or ERASE.
** UPDATE COMPLETED **	The update was correctly stored.
UPDATE IN PROCESS...	Wait for completion.
** SORRY, NO UPDATE STORED **	In response to selection DISPLAY.
** ALL UPDATES DISPLAYED **	End of the updates was reached.
** UPDATE ERASE COMPLETED **	After ERASE or ERASE ALL.
==> TO ERASE PRESS PF9 <==	Prompting stop.

IRECA - Message Update Selection (continued)

Messages

Message	Reason
** ENTER THE WANTED MESSAGE NUMBER **	Subselection D entered for DISPLAY. Enter the number of the message you want to display. If no number is entered all updates are displayed starting with the first one entered.
	Subselection E entered for ERASE. Enter the number to be erased.
ALTER NOW...	ALTER mode selected. Input fields are now unprotected to accept update data.
** INCORRECT KEY **	Typing error.
** PARAMETER MISSING OR INVALID **	Message missing.
** INVALID NUMBER (NOT 0..127) **	Wrong message number (Cursor points to begin of field).
** UPDATE AREA OVERFLOW **	Get diskette with higher level.
** DISKETTE ERROR **	An unrecoverable diskette error was detected. Try again with another diskette. If the error persists use the 53FD diagnostics for problem analysis.
** SELECTED UPDATE NOT FOUND **	May occur in response to selection DISPLAY or ERASE.
** UPDATE COMPLETED **	The update was correctly stored.
UPDATE IN PROCESS...	Wait for completion..
** SORRY, NO UPDATE STORED **	In response to selection DISPLAY.
** ALL UPDATES DISPLAYED **	End of the updates was reached.
** UPDATE ERASE COMPLETED **	After ERASE or ERASE ALL.
==> TO ERASE PRESS PF9 <==	Prompting stop.

System Test 4300 (ST4300) and OLTSEP

Introduction for ST4300

The ST4300 is a stand-alone test to be used as system test on 4300 Processors. The ST4300 is basically an ST-370 with enhancements to cover especially the 4300 Processor with 0.5 MB. The main purpose is to test the interface and the interaction of the attached devices.

For US only the ST4300 has to be ordered through the DOC (Diagnostic Order Calculator) and is supplied by the PID (Program Information Department). For WT follow local ordering procedure. It is written either on tape or disk along with other diagnostic programs (OLTs). Starting with EC 366453 (Mod-1/2) the ST4300 is also available on a separate diskette - the System Test Diskette (labelled 'Diag 5'). The ST370 User's Guide (D99-0370A) supplied with the ST4300 is still valid but the deviations described here for handling and supported devices, must be obeyed.

Enhancements of the ST4300 via ST-370

- 3278 and 3287 will configure and be tested as a 3270.
- 3310, 3340 natively attached, 3370, and 8809 will configure and be tested.
- The 4331 customer diskette will configure and be tested as 3540.
- The 4331 CA lines will only be configured by the ST4300.
- The loop attached devices will only be configured (if powered up). Neither the adapter nor the devices are tested by the ST4300.
- The ST4300 is also capable to test 3310/3370 disks in 23XX or 33XX emulation mode, but it requires that the disks are initialized by the customer as 'count-key-data' devices. The test can also be applied if the disk device is used in mixed mode. For example: One 2314 volume on a 3310 disk and the remaining part in FBA mode. Obey the limitations for the ST4300 diskette version described at the end of this subject.
- Any emulated CKD-disk (minidisk) can not be tested. The corresponding device address should be dropped.

How to Load the ST4300

Loading from Diskette

1. Make all devices to be tested 'ready'.
2. If the system is not running, perform IML from the control diskette 1 (FU 1). After IML complete the PROGRAM LOAD picture appears on the screen, proceed with step 4.

3. If the system is running, check that you are in the correct mode to run ST4300:
Call MODE SELECT picture, enter L, press ENTER. This selection displays the PROGRAM LOAD picture with the input from the previous load operation.

4. Check and if necessary correct the following specifications:

- PROGRAM RESET = CLEAR (C)
- MACHINE MODE = 370 (3)
- STORAGE SIZE = REAL (R)
- 1052 MODE = specify one of the following:

PRINT (P) - Printer Keyboard Mode (see Note below).

Verify that the hardcopy device is 'ready'. If no hardcopy device is available or if it is used for other than console message printing specify:

NO PRINT (N) - Printer Keyboard Mode (see Note below).

The 1052 mode will then use the screen as the only means for message output.

OFF (F) - 3270 Operation Mode

Note: If you are in 1052 mode (Printer Keyboard Mode) the keyboard is normally locked. It is freed by an read inquiry command which is invoked by pressing the REQ key. Any message can now be entered followed by pressing ENTER.

- NUMBER OF 3340 BUFFERS = 1
Only necessary if 3340/44 is directly attached at the FTA, otherwise leave field empty.
- NUMBER OF EMU BUFFERS = 1
Only necessary if the compatibility feature is installed, otherwise leave field empty.

Note on Number of Buffers: If necessary only one buffer should be specified to save MS-space. If MS-size available is too small (especially on 0.5 MB machines) ST4300 cannot be loaded. This results in the following message: INSERT CONTROL DISKETTE, PRESS MODE SELECT, DO CLEAR RESET AND TRY AGAIN, INVALID MSD ENTRY. To follow this message would force you in a permanent loop.

- Leave all other specifications unchanged. Verify that the load device specified by CHANNEL - CONTROL UNIT - DEVICE is ready, press ENTER.

Loading from Tape (continued)

Printout Example

```

ST4300 . RELEASE 12.0
ASM DATE=01/13/81, TIME=09.59
MODEL 4331,SER 20367,856K

EXTD FL PT,MVM INST,DECML
FETCH AND STORE PRT,TMR,370 INST,TOD
MONITOR CALL,CPU TIMER,EC,DAT

TO BYPASS INSTRUCTION PRINTOUT ENTER -BYPASS- NOW

TO STOP INSTRUCTION PRINTOUT PRESS EXTERNAL INTERRUPT
**NOTE** ENTERING ONLY 1ST LETTER OF MESSAGES IS NO LONGER VALID
    
```

11. When the printout is finished the processor enters wait state X'FF02'. This is indicated at the end of the instruction printout together with the message INTERRUPT FROM INPUT DEVICE, WAIT FOR READY MSG. TO PROCEED ENTER GO. The interrupt has to be given by pressing ENTER if in 3270 Mode or the REQ key if in 1052 Mode. In response READY is displayed on the screen. Respond with typing in GO and press ENTER.
12. The message PRECONFIGURATION STARTED is printed and after a short delay all available I/O addresses are printed out, and the processor enters wait state X'FF03'.

Preconfiguration Printout

```

          TABLE OF I/O ADDRESSES
          TO BE CONFIGURED ON THIS SYSTEM

011  015  017  01E  02D  02E  200
220  221  230  231  232  233  240
241  243  300

ENTER DROP CUU OR CNFG MESSAGE NOW.
WAIT CODE FF03.

CNFG                               ENTERED
CONFIGURATION STARTED
    
```

13. Any unit can be left unconfigured by the DROP CUU message (or DROP CUU CUU or DROP CUU-CUU or multiple combinations). After READY the DROP message prints another table of I/O addresses for a further check. When configuration is proper, type in the message CNFG (all four letters, not just C). The unit availability table (UAT) is then printed and the next wait state is entered (FF04).

Configured Devices

```

          UNIT AVAILABILITY TABLE

UNIT  UNIT  ADDRESS  TEST
TYPE  CLASS  CUU     LEVEL FEATURES
3270  GD     000011   0
3270  GD     000015   0
3270  GD     000017   0
3270  GD     00001F   *  INPUT DEV.
2540  PU     00002D   0  COL BIN
1403  PR     00002E   0  132 POS
3340  DS     000200   0  VOL ID CEPACK MOD 35
3370  DS     000220   0  MODEL 00
3370  DS     000221   0  MODEL 00
3370  DS     000230   0  MODEL 00
3370  DS     000231   0  MODEL 00
3370  DS     000232   0  MODEL 00
3370  DS     000233   0  MODEL 00
3310  DS     000240   0  MODEL 00
3310  DS     000241   0  MODEL 00
3310  DS     000243   0  MODEL 00
8809  TP     000300   0  MOD 0,9 TRK

CONFIGURATION COMPLETE
TEST LEVEL * INDICATES DEVICE NOT TESTED
WAIT CODE FF04

TO PROCEED ENTER GO
    
```

14. If the configuration is correct, the operator responds to message 'TO PROCEED PRESS INTERRUPT OR TYPE GO'. Relevant I/O tests are loaded followed by the ST4300 Test Control Program. ST4300 is now ready to perform its main function, as printed in a three-line message. Wait state (FF05) is entered, and the following messages or options (also indicated on the machine instruction printout) should be considered:

- Various assign messages (input, output, retain, and set clock).
- Vary test level (see ST4300 Test Levels).
- Enter run options.
- Other messages (write CUU, print, and tapemark CUU).

Introduction to OLTSEP/OLTs

OLTSEP/OLTs

An OLT is a test written for a specific type of I/O device. Most OLTs are able to run in concurrent mode (OLTEP), but some must be executed under a stand-alone control program (OLTSEP). These are called Central Mode OLTs. Each device is usually supported by a series of OLTs, which contain a complete test for the device.

Some devices mainly older OCR and MICR devices require time-dependent testing for complete testing. Others such as two-channel switches may require precise control of the channels for certain tests. Devices with such requirements usually include some central mode OLTs in the devices OLTs package. These tests should be run under ST4300 and require the customer to give you the system.

OLTEP

OLTEP is a series of programs, one version for each Operating System with OLTEP support. Each OLTEP program supplies a link between the device tool (or OLT) and the Operating System chosen by the customer.

How to Load the OLTSEP/OLT s

Loading from Tape

Proceed according to OLTSEP User's Guide Form No. D99-SEPEC-03.

Loading from Diskette

1. Make all devices to be tested 'ready'.
2. If the system is not running, perform IML from Control diskette 1 (FU 1). After IML complete the Program Load picture appears on screen.
3. Call MODE SELECTION picture, select CLEAR RESET (C), press ENTER. Wait until RESET COMPLETE appears on screen.
4. Call M/S PROGRAM SELECTION.
5. Select ST4300 (E), press ENTER. The display LOADER FOR SYSTEM AND I/O TESTS appears on screen.
6. Execute steps indicated on screen:

Insert diskette with system and I/O tests (diskette is labelled DIAG5).

Type in 'TXXX' (XXX = device type), press ENTER.

The load process is indicated by the message:

```
LOAD IN PROCESS
VERIFY IN PROCESS
LOAD DONE
```

7. Execute steps 4 to 7 indicated on the screen:
Insert functional diskette (FU 1)
Select customer MANOPS, press MOD SEL.
Do PROGRAM RESET, wait until RESET COMPLETE appears on screen.
Do RESTART
8. Press ENTER.
9. OLTSEP is now functional. If your printer has the address 00E the following message is displayed:
04 SEP188D ENTER DATE (AND TIME) - 'MM/DD/YY, HH/MM/SS'.

Note: Enter the date and time without the single quote ('), otherwise the message SYNTAX ERROR appears on screen.

If wait code FF9002 occurs the console CDS (configuration data set) is incorrect. To continue, press ENTER on the desired input device. OLTSEP then autoconfigures that device. If OLTSEP cannot autoconfigure the device wait code FF990A occurs. For further operational information refer to the OLTSEP User's Guide.

- If the printer CDS is incorrect, you are prompted to enter the address and device type of the output printer as follows:

Enter output device address and device type as follows:
CUU-DDDD, where CUU = device address and DDDD = device type.

Sample entry: 00E-1403

After you enter the device address and device type OLTSEP continues as described in the OLTSEP User's Guide. If a problem occurs, enter blanks in response to the above request (results in wait code FF9906), and then refer to the OLTSEP User's Guide. Valid device types are:

```
1403 3203 3262 3800
1443 3211 3289
```


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PU-BSM Test

Log Handling - Actions

Prerequisites

- 'Power Complete' light on

How to Select the Test

1. Insert the diagnostic diskette.
2. Press IML to reload the service processor.
(This ensures correct execution of the test).
3. Call M/S PROGRAM SELECTION. **1**
4. Key in selection for 'CENTRAL COMPLEX',
press ENTER. **2**
5. Select PU-BSM test, press ENTER. **3**
6. Press ENTER to start test.
 - Test runs in mode 4, (diagnostic mode),
default mode.
 - Run time about five minutes.
 - Pressing ENTER stops test at overlay end.
 - Pressing ENTER a second time the test con-
tinues to execute.
 - Test stops at test end displaying STOPPED
in **G**.
 - A reference code is displayed in **G** case of error.
Use this reference code to enter the appropri-
ate MAP.

How to Terminate the Test

1. Press ENTER, to stop the test.
2. Insert control diskette.
3. Perform re-IML.
4. Return to machine.

If you want to run another test return to M/S PRO-
GRAM SELECTION. Select new test.

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Log Handling - Results

Screen displays:

- 1** 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'
- 2** 'CENTRAL COMPLEX TEST SELECTION'
- 3** PU Test Frame Picture

A Display of Test Mode. Mode 4 is the default value, no
entry has to be made.

B Identifier of test section just running.
After the test has been started, the display identifier
changes whenever a new routine is executed, thus also
indicating that the test is running.

Displays the identifier of the test step.

D The card location(s) of the suspected FRU(s) are dis-
played in this field.

E Displays PU hardware data, if test runs in mode 3 and
stops with error. The displayed data is to be used in
case of support.

F Enter field for test options.

G Displays RUNNING, STOPPED, or a reference code,
if an error is detected.

H If one or more additional reference codes are dis-
played in this field, use these codes first for error anal-
ysis.

EC 366492
15 July 81

EC 366582
13 Sep 82

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CS-Test for Type 0 (continued)

Test Handling - Actions

Prerequisites

Selection of 'PU-BSM test'

How to Use the Control Store Test

1. Enter 'CT' in the SELECT field, press ENTER. 4
After a delay the CT selection picture is displayed with all default run parameters for the CT test.
2. If you want to run the CT-test in the default selection, press ENTER to start the test, otherwise type in the new run parameters first.

Test runs about one minute if the default selection is used and the CS-size is 16 K. For 32 K CS-size run time is approx. 2.5 minutes.

Result of Test Run

Up to ten errors can be displayed F. If an error is detected looping of this block is stopped. Test continues with next block.

The test stops if the ten error display lines are used up or after all loops are completed.

Test Handling - Results

4 PU-BSM-TEST M:CT ID: C: SYMP:

CS-TEST

C.	IS.....	XOR.....	ADR.	DI	BL	PA	LP
01	019FCFB7	00000020	7D6C	00	01	02	01
10	7031187D	00001000	7D4B	01	01	03	01

TEST PAT:

0 60960897

1 60693068

2 019FCF97

3 703108..

4 019FFC00

5 603103..

6 024E0000

F

SEL: CT B

BEG: 0040 D END: 8000 BLOCK: F0 PASS: 03 LOOP: 01 STOP

TIMER:OFF DATA: ADDR:

ERROR XXXXXXXX SYMP YY A

A Error $\hat{=}$ Indicates the occurrence of an error.

XXXXXXXX $\hat{=}$ Reference Code

SYMP YY $\hat{=}$ Symptom (card position)

YY = 02 \rightarrow C2
YY = 03 \rightarrow D2

B Selection Field

D Test Parameter Enter Fields

After selecting the CT-test the default values are displayed.

BEG: Begin address of test area must not be < X'0040'.

END: End address of area to be tested (< or = CS size).

BLOCK: Number of repetitions for each block.

PASS: Number of repetitions for each pass.

LOOP: Number of repetitions for whole test.

E Test pattern which is loaded into all blocks.

F See next page.

Diagnostic MS Test

Program Handling - Actions

- Selection of PU-BSM test

How to Select the DM-Test

Enter DM in the SELECT field of the PU-BSM test, press ENTER. This causes, after a delay the DM selection picture **5** to be displayed.

How to Use the Test

There are different cases where the DM test can be used. In any case press ENTER after you have entered your parameters. This causes the test to be executed once. If the parameter RUN: is changed to greater '00' the test loops until it is stopped by pressing ENTER, see Note under **D**.

Case 1:

A given address (from log display) is available. An uncorrectable error is assumed at this address. Enter this address in the UNCADR field, press ENTER.

Case 2:

No address available. The test is selected for diagnostic purposes. Do not change value in the UNCADR field, press ENTER.

For both cases refer to 'Result of DM Test Run' for test result interpretation.

Run the IM-test (see page 4339), if you suspect a failing card (s) and the DM test does not display an asterisk (*) for case 1 or no error count greater X'400' for case 2.

Test Handling - Results

Result of DM Test Run

If the test runs error-free, the test stops with the message

STOPPED in **E**

and NO ERROR displayed in **B**. In case of an error, the location of the failing card and an error count is displayed in field **B** together with the message STOPPED.

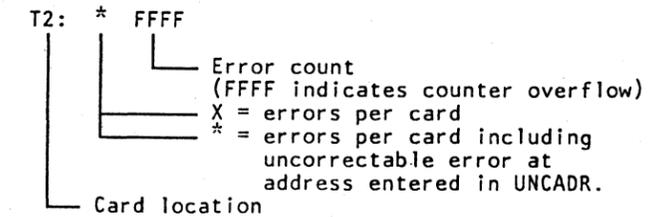
For case 1, replace the card if an asterisk is displayed. For case 2, replace any card(s) which shows count greater X'400'.

5

PU-BSM-TEST M:DM ID:	C:	SYMP:
DM-TEST ALLERR: 00000040	← A	
P2:X0040 ← B		
SEL: DM UNCADR: FFFFF8	RUN: 00	STOPPED
C	D	E

- A** In case of error(s) ALLERR: XXXXXXXX is displayed. In the X-field the total (ALL) errors of the tested array card (s) are given.

- B** This field gives the total errors of each array card.



- C** Enter field for the uncorrectable error address, found in the LOG. Default is FFFFF8 (=invalid address). Avoids erroneous indication of uncorrectable errors.

- D** If a value other than 00 is entered the test loops until stopped by pressing ENTER.

Note:

If you want to alter the run count the test must have run first with the default value (00) to allow resetting of counter fields.

How to Run the IM-Test (continued)

If the reference code displays X'0A' replace the FRU(s) **(H)** indicated. Use the FRU-table **(6)** for card location. Only if EOT is displayed behind **(J)**, the test has completed and all errors have been shown.

If the word LIMER is displayed behind ERROR **(K)** more than ten lines of error information are available. Replace the FRUs indicated in this display. Restart the IM-test and continue to replace FRUs if the test still shows errors. All errors have been displayed if EOT is shown.

```

5 PU-TOOL 18JUL80 RAO
IM-TEST ERROR <--- (E)
TYPE M ERRADR .ACTUAL. XOR.RSLT FRU
DATA R ODD018 BD72E5CA 00000001 T
DATA V ODD018 BD72E5CA 00000001 T } <--- (F)
DATA V ODD018 BD72E5CA 00000001 T }
+--- (H)
REF CODE : 4BB3XX81
SEL: IM BEG: 000000 END: 100000 LOOP CNT: 00 ECC(Y/N): Y
TIMER:ON DATA:
TOD:SEC STOPPED
803A
    
```

```

PU-TOOL 18JUL80 RAO
IM-TEST ERROR EOT <--- (J)
    
```

```

PU-TOOL 18JUL80 RAO
IM-TEST ERROR LIMER <--- (K)
    
```

FRU TABLE

6

FRU	NAME	FRU LOCATION
U	BSM CARD 9	01A-B1U2
T	BSM CARD 8	01A-B1T2
R	BSM CARD 7	01A-B1R2
Q	BSM CARD 6	01A-B1Q2
P	BSM CARD 5	01A-B1P2
N	BSM CARD 4	01A-B1N2
M	BSM CARD 3	01A-B1M2
L	BSM CARD 2	01A-B1L2

FTA (X) Test

Test Handling - Results

Prerequisites:

- IML
- Diagnostic diskette inserted
- PU/BSM test and IC-bus test run
- If the CTLI test has been executed before, verify that the wrap connectors have been removed and the CTLI cables are properly seated.

How to Select the Test

1. Call M/S PROGRAM SELECTION. Hold down ALT key and press DIAG key. **A**
2. Key in selection for 'CENTRAL COMPLEX', press ENTER. **B**
3. Select FTA test 1, 2 or 3, press ENTER. **C**
4. The status field displays SELECTION. Enter new run mode if you want to change the default. Press ENTER to start test.
 - Run time about two minutes.
 - Test stops at test end displaying STOPPED in **B**.
 - If an error is detected the test also runs to the end and in addition to the message STOPPED a reference code and at least one symptom code is shown in **A** and **C**.
By pressing ENTER a running test or routine can be stopped. Stop occurs always at routine end.

Run Modes

The following parameters **D** can be specified

LOOP (Y/N)

N=default. If Y is selected the test or routine will loop until stopped.

RTN: 01 TO:..

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- a. 01 TO.. = default if no TO-routine is specified. Test runs from routine 01 to last routine.
- b. To run or loop a complete test, not starting with RTN01:
Enter start routine number in the RTN-field, and start routine number minus 1 in the TO-field:
RTN: 08 TO: 07
- c. To run or loop a specific routine: Enter the routine number in both fields:
RTN: 05 TO: 05

Note: Routine 00 must not be entered. This is an auxiliary routine for special purposes.

ANALYSIS (Y/N):

Y=Default. If analysis is enabled (Y) symptom codes and a reference code are displayed in **C** and **A** in case of error.
Enter 'N' to suppress error analysis. This can be useful if 'loop a routine' is specified. In this case the routine loops under real-time conditions, that means, the analysis phase does not always interrupt the test execution.

ADAPT: 9 = FTA 1, 4 = FTA 2, 2 = FTA 3 (Physical address)

The adapter number is displayed automatically. Do not change the adapter number. To test another adapter select the appropriate test from the CENTRAL COMPLEX menu.
If a valid adapter number would be entered, the test starts but generates false reference codes. If an invalid number is entered, the message INV. INPUT is shown in **B**.

What to Do in Case of Error

If an error is indicated rerun the test with power off on all attached control units. If the error is still indicated use the reference code in **A** to enter the correct MAP. If no error is indicated suspect the control interface. Run CTLI Wrap test.

How to Terminate the Test

If you want to run another test return to M/S PROGRAM SELECTION. Select new test, otherwise perform the following steps:

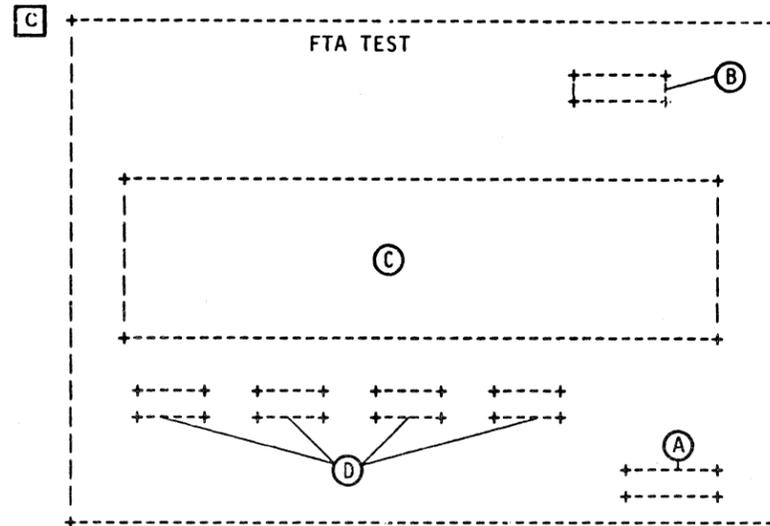
1. Press ENTER, to stop the test
2. Insert control diskette
3. Perform re-IML
4. Return machine

Test Handling - Results

Screen displays:

A 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'

B 'CENTRAL COMPLEX TEST SELECTION'



A Reference code

B Status of test

C Symptom code display field

D Run mode selection field

EC 366269
03 Aug 79

EC 366284
27 Mar 80

EC 366388
23 Jan 81

P/N 5683399
Page 1 of 6

4 350 F

MPX/BMPX Adapter Test

Test Handling / Actions

Prerequisites:

- Power complete
- Diagnostic diskette inserted
- PU/BSM test run, IC bus test run.

How to Select the Test

1. Call M/S PROGRAM SELECTION. Hold down ALT key and press DIAG key. **A**
2. Key in selection for 'CENTRAL COMPLEX', press ENTER. **B**
3. Enter appropriate selection for: MPX ADAPTER TEST or BMPX 1 or 2 ADAPTER TEST. to test the ACC/SCA cards of the MPX or BMPX adapter Press Enter **C**.
4. Press ENTER to start test.
 - Run time about 2.5 minutes
 - Test stops at test end displaying STOPPED in **B**.
 - If an error is detected the test also runs to the end and in addition to the message STOPPED a reference code and at least one symptom code is shown. **A** and **C**

By pressing ENTER a running test or routine can be stopped. Stop occurs always at routine end.

Run Modes

The following parameters **D** can be specified:

LOOP (Y/N)

N=default. If Y is selected the test or routine will loop until stopped.

RTN: 01 TO:..

- a) 01 TO.. = default if no TO-routine is specified. Test runs from routine 01 to last routine.

- b) To run or loop a complete test, not starting with RTN01:
Enter start routine number in the RTN-field, and start routine number minus 1 in the TO-field:
RTN: 08 TO: 07

- c) To run or loop a specific routine:
Enter the routine number in both fields:
RTN: 05 TO: 05

Note: Routine 00 must not be entered. This is an auxiliary routine for special purposes.

ANALYSIS (Y/N):

Y=Default. If analysis is enabled (Y) symptom codes and a reference code are displayed in **C** and **A** in case of error.
Enter 'N' to suppress error analysis. This can be useful if 'loop a routine' is specified. In this case the routine loops under real-time conditions, that means, the analysis phase does not always interrupt the test execution.

ADAPT: 6 = MPX, A = BMPX 1, 4 = BMPX 2 (Physical address)

The adapter number is displayed automatically. Do not change the adapter number. To test another adapter select the appropriate test from the CENTRAL COMPLEX menu.

If a valid adapter number would be entered, the test starts but generates false reference codes. If an invalid number is entered, the message INV. INPUT is shown in **B**.

What to Do in Case of Error

If the test stops with a reference code displayed in **A** go to the referenced MAP.

How to Terminate the Test

If you want to run another test return to M/S PROGRAM SELECTION. Select new test, otherwise perform the following steps:

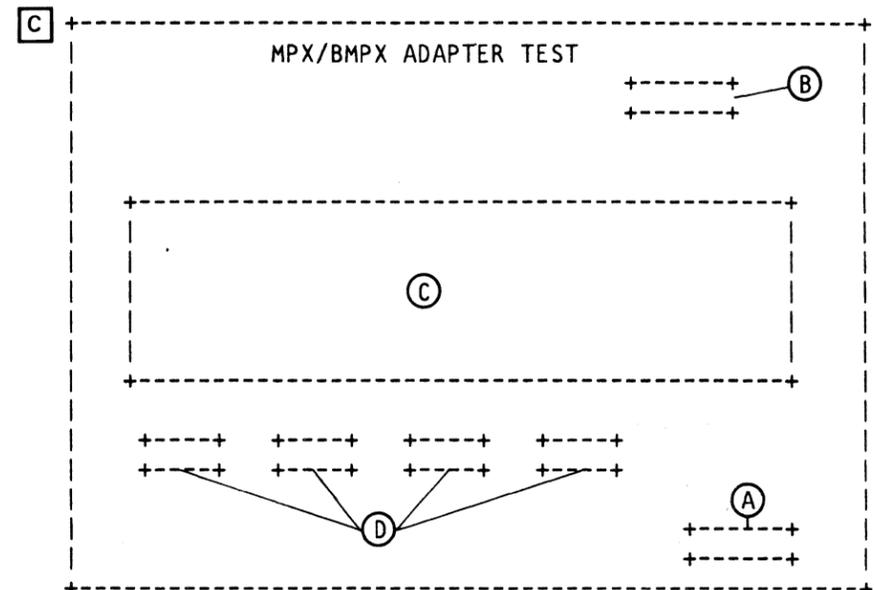
1. Press ENTER, to stop the test
2. Insert control diskette
3. Perform re-IML
4. Return machine

Test Handling - Results

Screen displays:

A 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'

B 'CENTRAL COMPLEX TEST SELECTION'



A Reference code

B Status of test

C Symptom code display field

D Run mode selection field

HSC ADAPTER TEST

Test Handling - Actions

Prerequisites:

- Power complete
- Diagnostic diskette inserted
- Processing Unit/BSM test, IC-bus test run

How to Select the Test

1. Call M/S PROGRAM SELECTION. Hold down ALT key and press DIAG key. **A**
2. Key in selection for 'CENTRAL COMPLEX'; press ENTER. **B**
3. Select appropriate test, press ENTER. **C**
Tests the ACC/SCA cards of the HSC adapter.
4. Press ENTER to start test.
 - Run time about 2.5 minutes
If routine 1F is excluded, runtime is only 0.5 minutes.
 - Test stops at test end displaying STOPPED in **B**. If any routine from 0 to 1E shows an error stop test and exclude routine 1F which would take two minutes run time. Run time reduces to 0.5 minutes.
 - If an error is detected the test also runs to the end and in addition to the message STOPPED a reference code and at least one symptom code is shown. **A** and **C**
By pressing ENTER a running test or routine can be stopped. Stop occurs always at routine end.

Run Modes

The following parameters **D** can be specified

LOOP (Y/N)

N=default. If Y is selected the test or routine will loop until stopped.

RTN: 01 TO:..

a. 01 TO.. = default if no TO-routine is specified. Test runs from routine 01 to last routine.

b. To run or loop a complete test, not starting with RTN01:

Enter start routine number in the RTN-field, and start routine number minus 1 in the TO-field:
RTN: 08 TO: 07

c. To run or loop a specific routine:

Enter the routine number in both fields:
RTN: 05 TO: 05

Note: Routine 00 must not be entered. This is an auxiliary routine for special purposes.

ANALYSIS (Y/N):

Y=Default. If analysis is enabled (Y) symptom codes and a reference code are displayed in **C** and **A** in case of error.
Enter 'N' to suppress error analysis. This can be useful if 'loop a routine' is specified. In this case the routine loops under real-time conditions, that means, the analysis phase does not always interrupt the test execution.

ADAPT: 1 (Physical address)

The adapter number is displayed automatically. Do not change the adapter number. To test another adapter select the appropriate test from the CENTRAL COMPLEX menu.

If a valid adapter number would be entered, the test starts but generates false reference codes. If an invalid number is entered, the message INV. INPUT is shown in **B**.

What to Do in Case of Error

If the test stops with a reference code displayed in **A** go to the referenced MAP.

How to Terminate the Test

If you want to run another test return to M/S PROGRAM SELECTION. Select new test, otherwise perform the following steps:

1. Press ENTER, to stop the test
2. Insert control diskette
3. Perform re-IML
4. Return machine

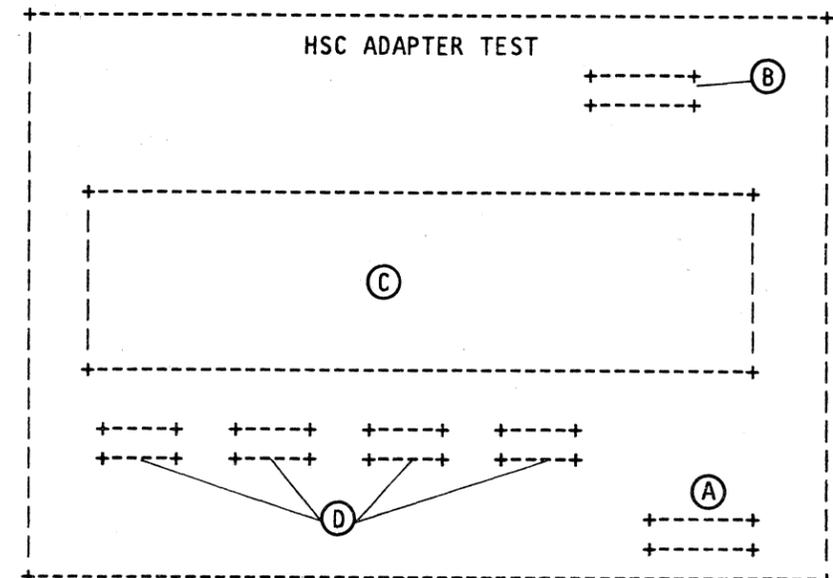
Test Handling - Results

Screen displays:

A 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'

B 'CENTRAL COMPLEX TEST SELECTION'

C



A Reference code

B Status of test

C Symptom code display field

D Run mode selection field

Disk/Tape Inline Test - General

Before running the ILTs, read the following:

- Do not run other tests concurrent to the 'disk/tape inline' tests.
- Only one device and its controller can be tested at a time.
 - On devices with a CE panel (for example, 3340), set the CE switch to CE mode.
 - For 3340: Bring inset on the handle of the data module in 'write enable' position.

For 3370: Set the Read/Write enable switch to the 'write enable' position.
- The device to be tested cannot be used by the customer and must be taken out of the operating system by respective control statements.

If the customer program tries to access this device, the command will be terminated and 'Intervention Required' is indicated.
- ILT routines may consist of several tests, which run sequentially or can be executed separately, as required by the MAPs.
- Various run and control modes for execution can be selected, when told by the MAPs.
- Status messages will be updated in parallel at the screen and at the CE panel.
- By pressing MOD SEL or DIAG key, running ILTs are discontinued, for example, for man Ops. 3370 ILTs controlled by the MD cannot be discontinued, see 'Exceptions for 3370'.
Note that the ILTs are not automatically restarted unless the ILT program is recalled by pressing the CHG DPLY or the CNCL key.
- Remote operator console support and remote ILT execution are mutually exclusive.

Exceptions for 3310

- Do not select an individual test of routine 71.
- Do not run routine 74 stand-alone.

Exceptions for 3340/3344

Inline Test Handling with String Switch Feature Installed

The 4331 processor supports the string switch feature only in static mode. This means that via the toggle switches A and B on the 3340 controller one interface has to be enabled while the other interface must be disabled.

The enabled string switch interface is then seized by the FTA of the 4331 processor with the first addressing of a 3340/3344 and remains in this state until power at the control unit is turned off.

Therefore the inline tests must be executed on the presently seized interface except for the Dynamic String Switch Routine B6.

Dynamic String Switch Routine

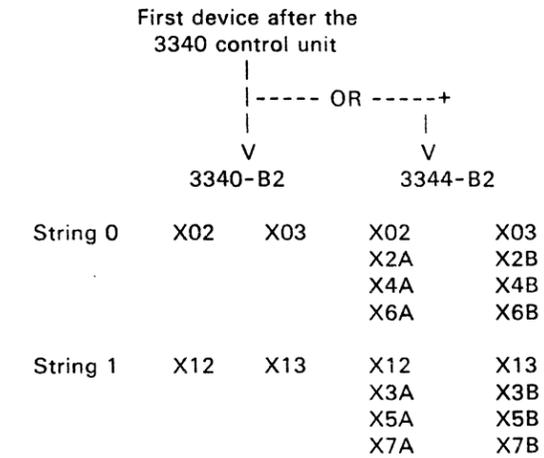
To test the string switch feature dynamically use routine B6.

- No concurrent maintenance possible. All customer applications must be terminated which use the interfaces to be tested.
- Press STOP key at the operator console keyboard.
- Enable also the second interface (both switches A and B must now be set to 'enable'). Remember that the interface just enabled must be disabled again under item 5.
- Run routine B6 as described in the 3340 MLM. Display of control information '8DFF' and '3FFF' is shown only on the 3340 CE panel.
- After completion of routine B6 turn power off and set the interface switch which was enabled under item 3 to disable. Turn power on again. The enabled interface will be seized again with the first addressing of a 3340/3344 device.

Exceptions for 3344

Each 3344 device represents four logical 3340 devices. Each 3344 has therefore four logical 3340 addresses of which the lowest one is identical to the physical address of the 3344. To run ILTs on 3344 devices enter the lowest 3340 logical device address.

Example:



X = Channel address

Disk/Tape Inline Test - General

Exceptions for 8809

- Before starting the tape inline tests insure that:
 1. A good scratch tape is loaded.
 2. The tape has been rewound to the load point.
 3. The tape drive is READY.
- Unless otherwise instructed by the MAPs, always run the Diagnostic Linked Series (DLS) starting with routine 40.
- In the reference code D8RRRR81 (line 23 on the screen) RRRR is the two-byte Isolation Code, where the left byte of RRRR indicates the routine identifier and the right byte indicates the stop code.
- Before terminating tape inline tests (Control Option 30) start test routine 6A, '8809 Termination'.

Disk/Tape Inline Test (continued)

Test Handling - Actions

3. Select the device type code from field **A**. Enter the device type code and the physical device address in the selection field **B**. Screen **3** is displayed.

For 3344 device address see 'Exceptions for 3344' on page 4400.

4. For 3370 devices further test handling is done from the maintenance device (MD), if available. (See 'How to Select 3370 Inlines', page 4401.)

For devices other than 3370 continue here. Select the routine identifier from field **C** and enter it in the selection field **D**. (See 'Exceptions for...', page 4400 through 4402.)

On the screen, lines 1-20 will change from DISK/TAPE INLINE RUN/CONTROL OPTIONS to the system message buffer (customer screen display).

5. Observe the status field **J**, and wait for message 'XXXX CA ANSWER XXXXXXXX'. (A layout of the status field is shown on page 4420.)
6. For a 3340/44 device further test handling can be done from the 3340 CE panel. For other device types continue with step 7.
7. Press CHG DPLY (change display) key. Screen **4** is displayed. You must always have this screen when you want to change run/control options.

Note: The CHG DPLY key causes the screen display to change from the system message buffer to the DISK/TAPE INLINE RUN/CONTROL OPTIONS picture, and vice versa.

3

XXXX ROUTINE SELECTION

C

SELECTION: 8 **D**

J-----XXXX CA ANSWER XXXXXXXX

4

DISK/TAPE INLINE RUN/CONTROL OPTIONS

E **F**

DEFAULT RUN OPTION = 08 **K**

*DISPLAY OF RUN INFO
PREVENT / ALLOW PRESS PF4

SEL RUN OPT:08 CUU =XXX
RTN ID = XX QVY NR = ..
TST NR = .. QVY ID = ..

SELECTION: 00..... **L**

H TEST **G**

DATA: ADDR:

J

- C** Menu of available inline routines for selected I/O.
- D** Enter field for the routine ID offered in **C**.
- J** Status and reference code

UUUU	IS	STATUS	UU RR RR XX	B1 B2 B3 B4
Unit Type	S	Status Message	Reference Code	4 Bytes Additional Information
----	A			
3310	T			
3340	U			
3344	S			
3370				
8809				
	C O D E			

For details refer to page 4420.

- E** Table of all run options.
- F** Table of all control options.
- G** This part of the run parameters may be stopped to be displayed.
- See message **L**.
- H** Enter field for run and control options. Normally the selected control option (for example, 00) is displayed here.
- J** Status and reference code (see above table).
- K** Run parameter field. The shaded parts are parameters from the program. The other parameters had to be entered before and also can be altered during inline selection.
- L** Additional error bytes or run information.

Disk/Tape Inline Test (continued)

Test Handling - Actions

How to Change the Run Option

If you are asked to change the run option type in the ID **E** of the option you want, behind SELECTION: Overwriting 00, press ENTER. The selected run option is then displayed in run parameter field **K**. 00 will again be displayed behind SELECTION.

For details refer to 'Run Options - Explanation' (page 4425).

How to Change the Control Option

If you are asked to change the control option, do the following:

1. Stop running inline if not yet stopped by pressing ENTER.
2. Enter control options and parameters as stated in the device - MLM, press ENTER.

For details refer to 'Control Options - Explanation'.

How to Stop or Terminate Inlines

1. Stopping of Inline Tests

Enter run option 00 in the selection field **H**. This stops a running test, but does not terminate inline mode.

2. Termination of Inline Mode

- Exception for 3370 Disk Inlines

Before terminating 3370 Disk Inlines (control option 30) refer to 'Reset CE Mode', page 4401.

- Exception for 8809 Tape Inlines

Before terminating tape inline tests (control option 30), start test routine 6A '8809 Termination'.

- To terminate inline mode any running test must be stopped first (see step 1). Then enter control option 30 in the selection field **H**. This terminates inline mode, resets the TEST indicator (line 21), and displays the system message buffer (customer screen).

Note: If control option 30 fails to terminate inline mode, a 4331 hardware malfunction is suspected. In this case, the customer must terminate his programs and perform a system reset. Follow the reference code displayed.

- If control diskette FU2 has been installed, insert control diskette FU1. Caution: Do not press the IML key.

Any error log that occurred while diskette FU2 was installed is stored on this diskette. Check diskette FU2 for new log entries.

- Reset of CE mode for 3340/44

Turn off the CE mode switch at the CE panel and press ATTENTION.

Run Options - Explanation

- Are offered by the 'Disk/Tape Inline Run/Control Options' picture.
- Allow selection of a particular routine run mode, if the default run mode ('08') is not desired.
- Selection of a run option de-activates the option previously selected.
- Selection is possible via operator console or via CE panel. Diagnostic execution must be stopped before.
- The selected run option is displayed in the field 'SEL RUN OPT.' of the 'RUN INFO' on screen.

Dynamic Error Display

- Run options 01, 03, 05, and 07 do not stop the test when an error is detected. Errors are displayed dynamically, while the test continues execution.

The error status information is displayed as follows:

Line 17 and 18 on the screen:

The message DIAGN ERROR, and up to 15 error bytes.

Line 23 on the screen:

The inline status '8D', the message ERROR, and the reference code.

- In case of intermitten errors, the message ERROR (line 23) is replaced by the message RUNNING while the error status information (line 17 and 18) remains on the screen.

CAUTION: The error status information will be reset when the loop is stopped (control option 00).

- The dynamic error display is also used for certain I/O device adjustments. As long as the adjustment is not satisfactory, the message ERROR is displayed (line 23). When the adjustment has been corrected, ERROR is replaced by RUNNING. In this case the error status information (line 17 and 18) is meaningless.

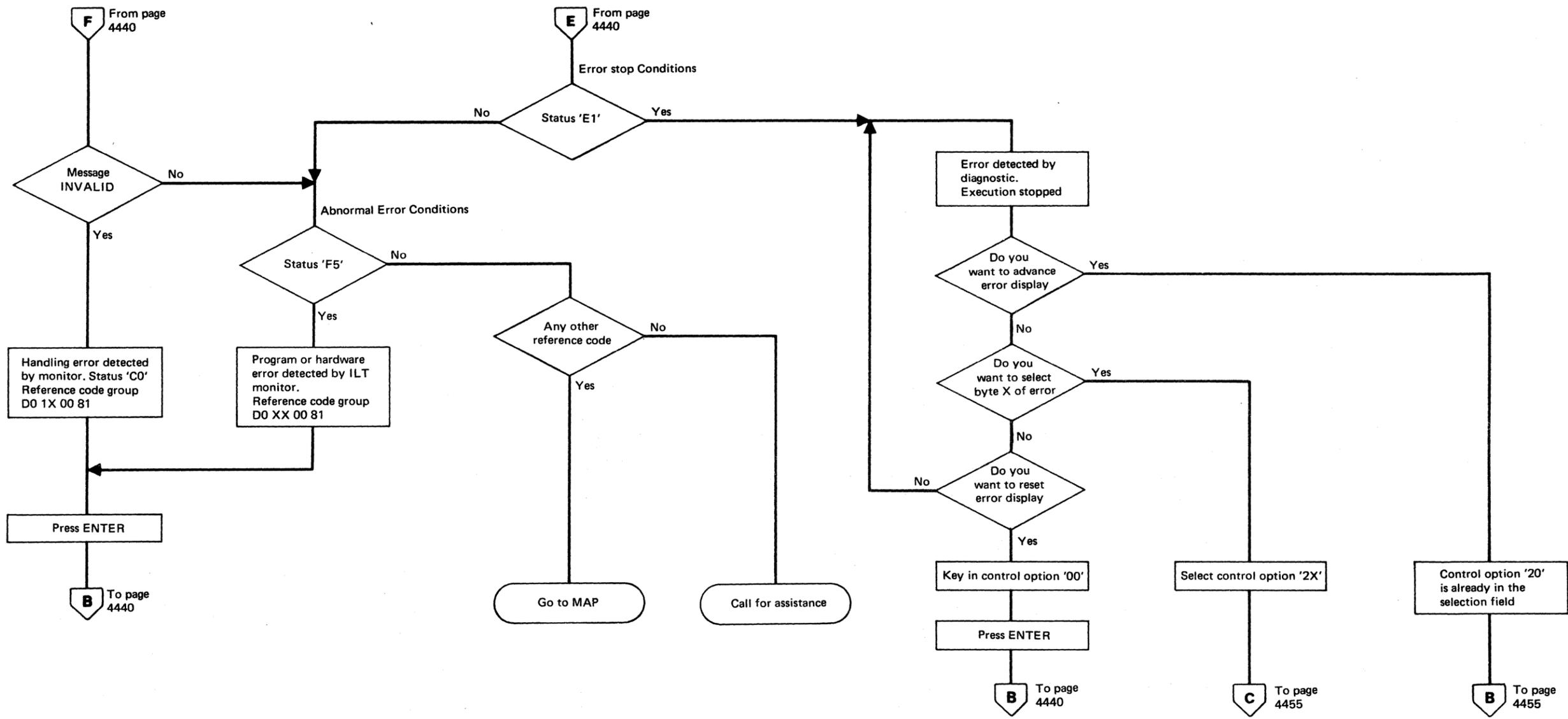
Run option (Hex)	Meaning of bits					Description	
	4 Reset run options	5 Inhibit routine linking	6 Loop routine	7 Bypass error stop			
01				X	Single execution	of a stand - alone routine or a linked series of routines	Dynamic error display
02			X		Looping	of a stand - alone routine or a linked series of routines	Stop on error
03			X	X	Looping	of a stand - alone routine or a linked series of routines	Dynamic error display
04		X			Single execution	of a stand - alone routine or any routine of a linked series of routines	Stop on error
05		X		X	Single execution	of a stand - alone routine or any routine of a linked series of routines	Dynamic error display
06		X	X		Looping	of a stand - alone routine or any routine of a linked series of routines	Stop on error
07		X	X	X	Looping	of a stand - alone routine or any routine of a linked series of routines	Dynamic error display
08 (default)	X				Single execution	of a stand - alone routine or a linked series of routines	Stop error

Control Options - Explanation (continued)

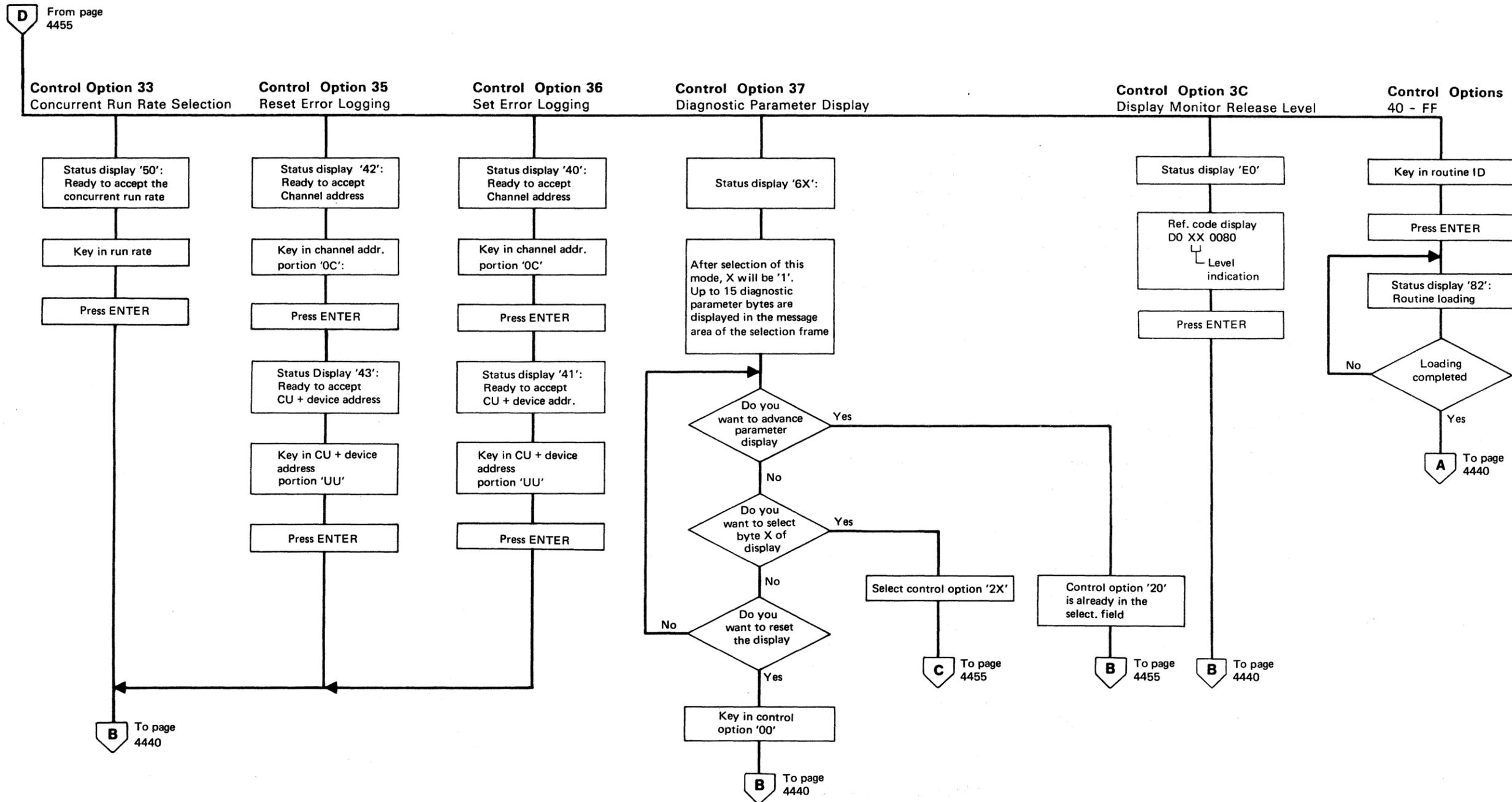
Opt.	Name	Description
30	Terminate inline mode	<ul style="list-style-type: none"> Used to terminate inline testing of the selected device.
31	I/O address entry	<ul style="list-style-type: none"> Used to select another device for inline testing, after testing of the previously selected device is finished. <p>To run inlines subsequently for other devices (for example, during installation) use control option '31'.</p> <ol style="list-style-type: none"> Stop diagnostic execution by pressing ENTER. Enter control option '31'. The status field J will ask for the channel portion of the I/O address. Enter channel address, format '0C', 'C' is channel number (Example: '02' for 3310). The status field J will ask for device address of I/O device. Enter the control unit and device address, format 'UU' Control Unit address _____ Device address _____ <p>Example: '42' for 3310</p> <p>The status field J will show 3310 CE ANSWER DO XXXX 80 indicating that the I/O address has been accepted.</p>
33	Concurrent run rate selection	<ul style="list-style-type: none"> Allows selection of a variable run rate for diagnostic execution concurrent to customer's application. The customer should be consulted before run rate selection because the run rate may influence the customer's system performance and the CE time to repair a device out of order. Run rate options '00' to '08': 00 = Fastest diagnostic run rate with the greatest impact on system performance. 05 = Default run rate, set automatically during initiation of inline mode. 08 = Slowest diagnostic run rate with the least impact on the system performance. The selected run rate has no effect if the PU is stopped or on nonconcurrent maintenance. <p><i>continues in next column</i></p>

Opt.	Name	Description
33		<ul style="list-style-type: none"> Invalid run rate entries (higher than 08) will force automatically default run rate 05.
35	Reset error logging mode	<ul style="list-style-type: none"> Resets logging mode for one device. Error logging mode set for other devices remains active.
36	Set error logging mode	<ul style="list-style-type: none"> Allows logging of detailed sense information about successfully retried errors during customer operation. It is possible to set this option for more than one device in order to investigate device interrelationships. Once set, the option will remain set until a reset (control option 35) is issued or the machine is IML-ed. If more than one device is to be set to this mode, the option must be applied separately for each device address. CAUTION: 'Intervention Required' may be indicated if a device is selected for inline mode concurrent with customer operation. Therefore, notify the system operator that the selected device is temporarily not available for his application program. The customer can use the device again after you have terminated inline mode.
37	Start diagnostic parameter displays	<ul style="list-style-type: none"> Allows displaying of the actual diagnostic parameters (default parameter or entered parameters) If this option has been selected via the operator console, all parameters are displayed in the message area of the 'Run/Control Options' picture: Byte 0 in place of Error Code. Bytes 1 to 4 in the 'Additional Information' of the status field (line 23). Status '60' ANSWER is displayed. The first byte is displayed in the 'Program Control Display' of the CE panel. To display additional bytes or to select a particular byte 'X', option '20' or '2X' may be selected. If status '6X' is displayed, the 'X' corresponds to the parameter byte 'X'.
3C	Display ILT monitor release level	<ul style="list-style-type: none"> Displays the release level of the PU part of the ILT monitor.
40 to FF	Routine ID selection	<ul style="list-style-type: none"> When execution of a selected routine is completed, another routine may be selected by entering the routine ID.

Inline Test Handling (continued)



Inline Test Handling (continued)



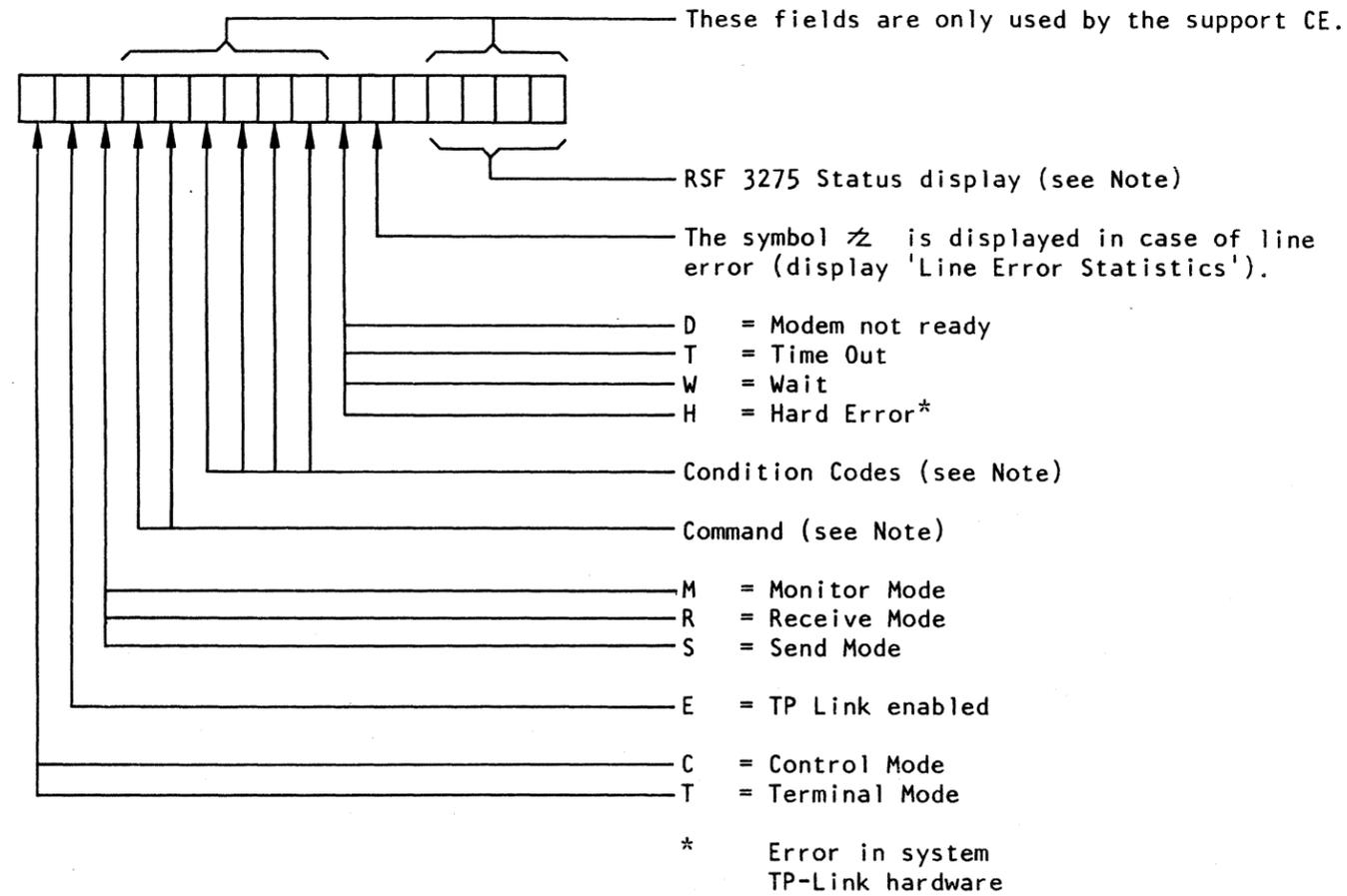
Utilities Program Selection

LV: 81240222	UTILITIES PROGRAM SELECTION	
0 = MES UPDATE	5 = BMPX CONFIGURATOR	B = DIAG. COMMUNICATION
1 = REMOTE SUPPORT	6 = HSC CONFIGURATOR	C = TOD CORRECTION
2 = MAN.-MCTF-INSTALL.	7 = AUTO.-MCTF-INSTALL.	D = DISPLAYS AND PRINTERS
3 = ALTER CHANNEL NUMBER	8 = RECORD DISPLAY	
4 = FTA CONFIGURATOR	9 = DISKETTE IDENT.	F = OTHERS
	A = COPY CONFIGURATOR	
SELECTION: C		
	370 TIMER: ON	DATA: ADDR:
	TOD: SEC	
0803		

Follow the reference in the table to find more information on the above subjects.

Selection Identifier	Reference
0, 3, 4, 5, 6, A, C, D	See Section 6, use 'Table of Contents'
1	See the following pages
2, 7	See pages 4530 through 4533
8, B, F	For use in case of support
9	See page 4540

Remote Console Support Indicator Field (Line 25, Pos. 65 - 80)



Note: If information is required, contact your specialist.

External Modem Interface Card - EIA/CCITT V24

General Description

The EIA Interface Card is a 2W-3H Logic Card, which converts the VTL-levels of the CCA card to EIA/CCITT levels of the modem and vice versa.

Wrap

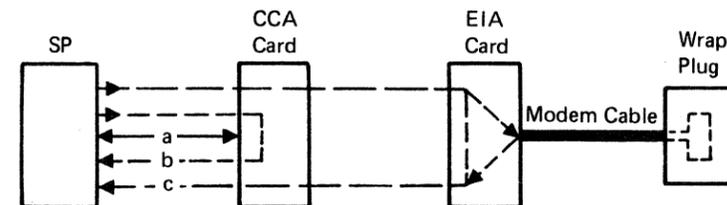
The wrap option 'card wrap' is jumpered to personalize the EIA card to respond to the card wrap test.

Card Wrap Test

If you select the 'integrated test' under REMOTE CONSOLE SUPPORT or the 'adapter test' under RSF DIAGNOSTICS, the following takes place (see also next page):

A command string is executed which performs:

- a) A static CCA card test
- b) A dynamic CCA card wrap test
- c) A dynamic EIA card wrap test

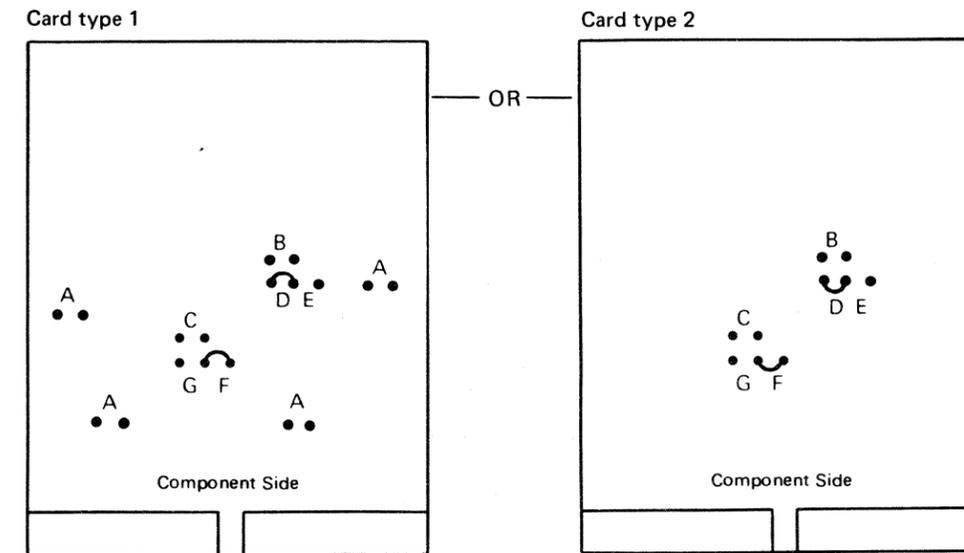


Note: If you execute the cable wrap test, the data path 'C' will then include the cable between the EIA card and the modem.

Jumper Setting

Wrap Options	JUMPERS						
	A	B	C	D	E	F	G
Card Wrap	Remove	Remove	Remove	Install	Remove	Install	Remove

Note: The clocking (modem or CCA clock) does not affect the jumpering.

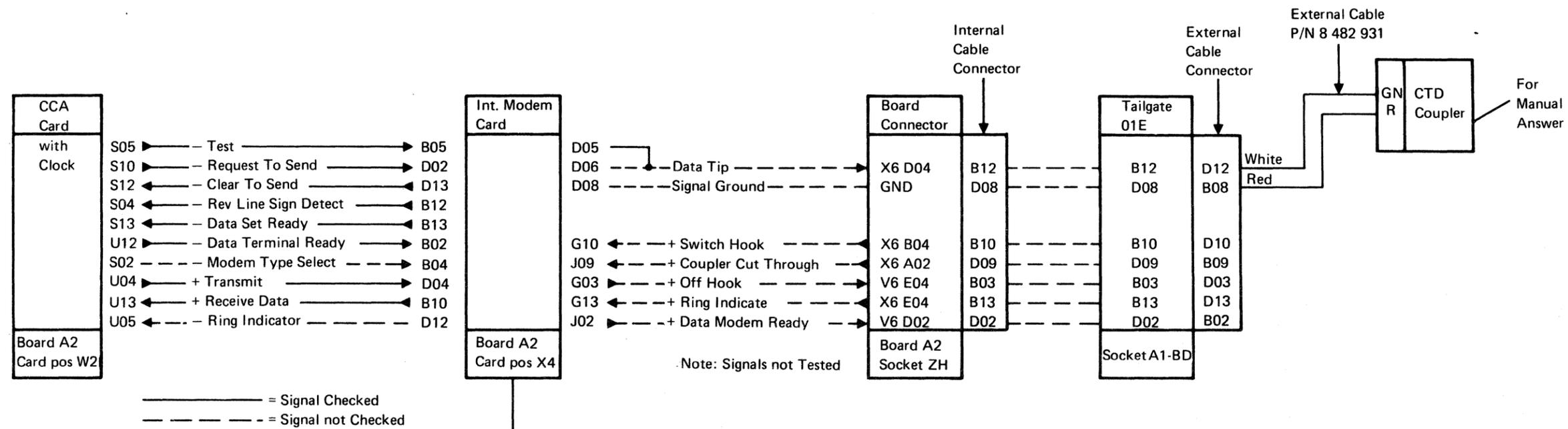


Voltage: Automatic voltage adaption.

For part numbers refer to plug list in binder MI 30

Signal Flow in the Integrated Modem Interface

Modem Type: US Switch Network Auto Answer (US SN AA) Card Code CE 60 (SD5)



Note: Set the transmit level as specified by the telephone company. See 'Transmit Level Setup' on page 4503 for adjustment.

US and Canada Modems Adjustments

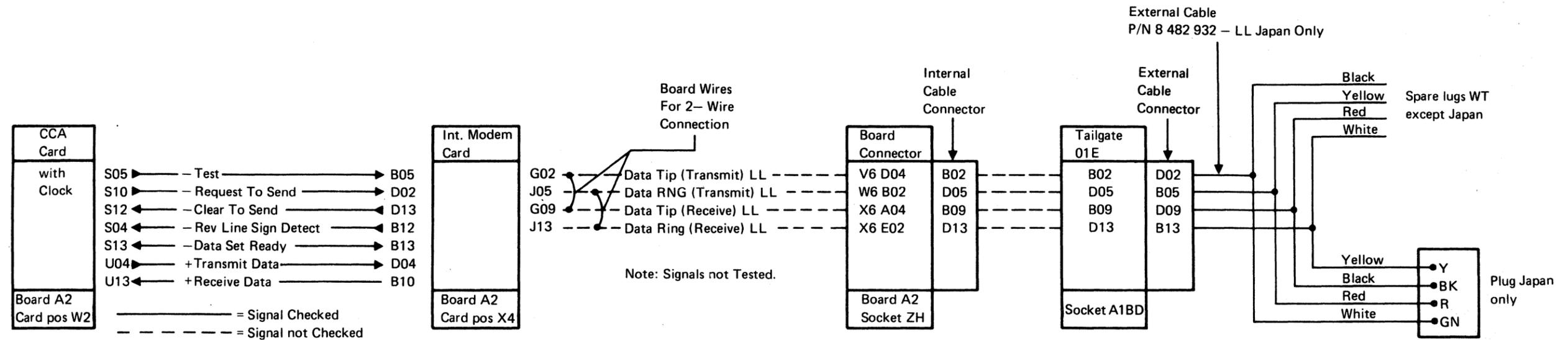
Card Code	Modem Type	Line Type	Rocker Switch Setting							
			J	K	L	M	N	P	R	
CE 60 or SD 5	US SNAA	Switched	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF

The following are obtained automatically:

- 2-wire line connection
- Clear to send delay 230 MS
- Echo Clamp 150 MS
- Signal threshold:
 - ON at 43 dBm (10-20 ms delay)
 - OFF at 48 dBm (5-15 ms delay)

Signal Flow in the Integrated Modem Interface

Modem Type: WT Leased Line (WT LL), Card Code CE 65 (SE 1)



WT Modem Adjustment Procedure

1. Equalizer Setting (Receive Level).

See figure on the right side for proper switch setting.

Note 1: Equalizer Switches

- CC - Normal delay
- AA - Disable High Frequency Delay
- DD - Disable Mid Frequency Delay
- BB - Disable Low Frequency Delay
- N - Disable HF AMP BOOST

If unsatisfactory operation is encountered on 'worst case' lines, the equalizer switches, AA, BB, CC, DD, and N should be set to off before setting any other equalizer switch.

Contact your TP specialist for specific information for your installation.

2. Transmit Level Setting

Note 2: Set the transmit level as specified by the PTT. See 'Transmit Level Setup' on page 4503 for adjustment. Contact your TP specialist for specific information for your installation.

Card Code	Modem Type	Line Type	I	J	K	L	M	N	P	AA	BB	CC	DD
CE65	WTLL	Leased 2-wire CTS = 30 MS Set Equalizer = Normal CTS = 80 ms CTS = 230 ms	OFF	OFF	ON	X	ON	ON	OFF	ON	ON	ON	ON

The following are obtained automatically:

- Signal threshold:
 - On at -43 dBm (10-20 ms delay)
 - Off at -48 dBm (5-15 ms delay)

Echo clamp setting :
ON = 50 ms delay
OFF = 150 ms delay

RSF Diagnostics

Program Handling - Actions

Prerequisites

- Remote Support Facility must be installed.
- Control or diagnostic diskette inserted.

How to Select the RSF - Diagnostics

1. Call M/S program selection **A**.
2. Key in selection for UTILITIES/REMOTE **B**.
3. Select Remote Support **C**.
4. Select Diagnostics **D**.

How to Use the Individual Tests

The menu offers various tests to check out the remote support facility. Always run the adapter test first.

The selection menu remains on the screen when a test is selected. A status is displayed in field **A** and the message field **B** will display the result of the test. In some cases additional information is given in **B**. Whenever a test has ended or is stopped, any test from the diagnostic menu can be selected just by entering the proper selection.

Adapter Test

Enter the proper selection in the selection field, press ENTER. The test starts to run displaying RUNNING in the status field and a message that the test has started **E**. The test cannot be stopped; however, after the test has ended you may restart it by pressing ENTER.

The test ends with SELECT in the status field and a message if the test has encountered an error or not. **F**

Test Handling - Results

Screen displays:

- A** IBM MAINTENANCE AND SERVICE PROGRAM SELECTION
- B** UTILITIES PROGRAM SELECTION
- C** REMOTE SUPPORT SELECTION

D

	REMOTE	TP-DIAGNOSTICS	A
			SELECT
A = ADAPTER-TEST		D = EIA(V24)-CABLE WRAP-TEST	
B = SEND TEST-PATTERN (1200BPS)		E = SCOPE RECEIVED TEST-PATTERN (1200BPS)	
C = SEND TEST-PATTERN (600BPS)		F = SCOPE RECEIVED TEST-PATTERN (600BPS)	
R = RESET MODEM TO 'TALK-MODE'		(SELECTION 'R' FOR WT ONLY)	

B

SELECTION:
=====

- A** STATUS FIELD
- B** MESSAGE FIELD

E

R = RESET MODEM TO 'TALK - MODE' (SELECTION 'R' FOR WT ONLY)
 >> ADAPTER-TEST STARTED...(RUNTIME =40 SEC) <<
 >> NOTE: FOR WT INTEGRATED MODEM (38LS) THE TEST MUST <<
 >> NOT BE EXECUTED IF THE HANDSET IS OFF HOOK ! <<

SELECTION: A
=====

F

R = RESET MODEM TO 'TALK- MODE' (SELECTION 'R' FOR WT ONLY)
 >> ADAPTER-TEST ENDED, NO ERROR FOUND<<
 >> NOTE: FOR WT INTEGRATED MODEM (38LS) THE TEST MUST <<
 >> NOT BE EXECUTED IF THE HANDSET IS OFF HOOK | <<

SELECTION: A
=====

In case of error, see example printout of **F** on next page.

Temporary Storage and Display of Data Bank Information

Program Handling - Actions

Purpose

This function allows to store up to 20 screen pictures onto the diagnostic diskette for retrieval.

Each time a new data bank connection is established, the data retrieved is stored starting in position 1 of the 20 position storage area, thus overwriting the information received during the last data bank connection.

How to Store Data Bank Information

1. Insert diagnostic diskette into system drive.
2. Establish data bank connection. Information retrieved from the data bank may be stored picture by picture pressing the COPY key. The Copy-key function causes at the same time a printout, if a console printer is attached.

How to Display the Stored Data Bank Information

1. Call M/S Program Selection. **A**
2. Key in selection for UTILITIES. **B**
3. Select REMOTE SUPPORT. **C**
4. Select REF CODE FIX DISPLAY. **D**

Press ENTER after picture D appears on the screen. This displays the first picture of the stored data bank information. Use the Copy-key function to get a printout on the console printer, or use the FRIEND PRINT LOG function. Press ENTER to get next picture displayed, and so on until the message ALL SCREENS DONE is displayed.

Program Handling - Results

Screen displays:

- A** 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'
- B** 'UTILITIES PROGRAM SELECTION'
- C** 'REMOTE SUPPORT SELECTION'

D

```
*** REF-CODE FIX DISPLAY ***
TO PRINT THE SCREENS STORED BY
REMOTE ACTIVITIES THE COPY PRINTER
MUST BE ACTIVE OR FRIEND MUST BE SET UP
TO PRINT THE SCREEN.

PRESS ENTER TO START, THEN ENTER FOR NEXT DISPLAY.
PRESS COPY KEY TO PRINT.
FOR IRECA UPDATE OR
MCTF LOCATE PRESS PF1      See Note
```

Note: For installing a IRECA update or MCTF received from a data bank refer to page 4517.

FRIEND Print Log Function

Use this function to get a copy printout of the screen display on a channel-attached printer. Proceed as follows:

1. Perform system IML with the control diskette (if not done before).
2. Perform system reset clear (manual operation selection 'C').
3. Change diskette - insert the diagnostic diskette.
4. Call M/S Program Selection, key in selection for FRIEND.
5. Wait until 'FRIEND LOAD IS COMPLETED' is displayed on screen.

6. Change diskette - insert the control diskette.
7. Perform 'program RESTART' (manual operation selection 'R'), then press ENTER The FRIEND picture is now displayed.
8. Enter the secondary printer address together with the keyword LOG separated by a comma; for example, 2E,LOG.
9. Press ENTER.
The intensified display PRNTLOG is shown in the status field.
10. Select screen image or log picture to be printed. Press the COPY key to get a copy printout. For every screen display you want to copy, the COPY key must be pressed again.

To restart the FRIEND after the PRNTLOG function, insert the control diskette, call the MODE SELECTION picture and perform:

1. Program Reset
2. Program Restart

You may now proceed with any other FRIEND function or if you want to use PRINT LOG again, continue with item 8 of the described procedure.

How to Read and Identify the Link List

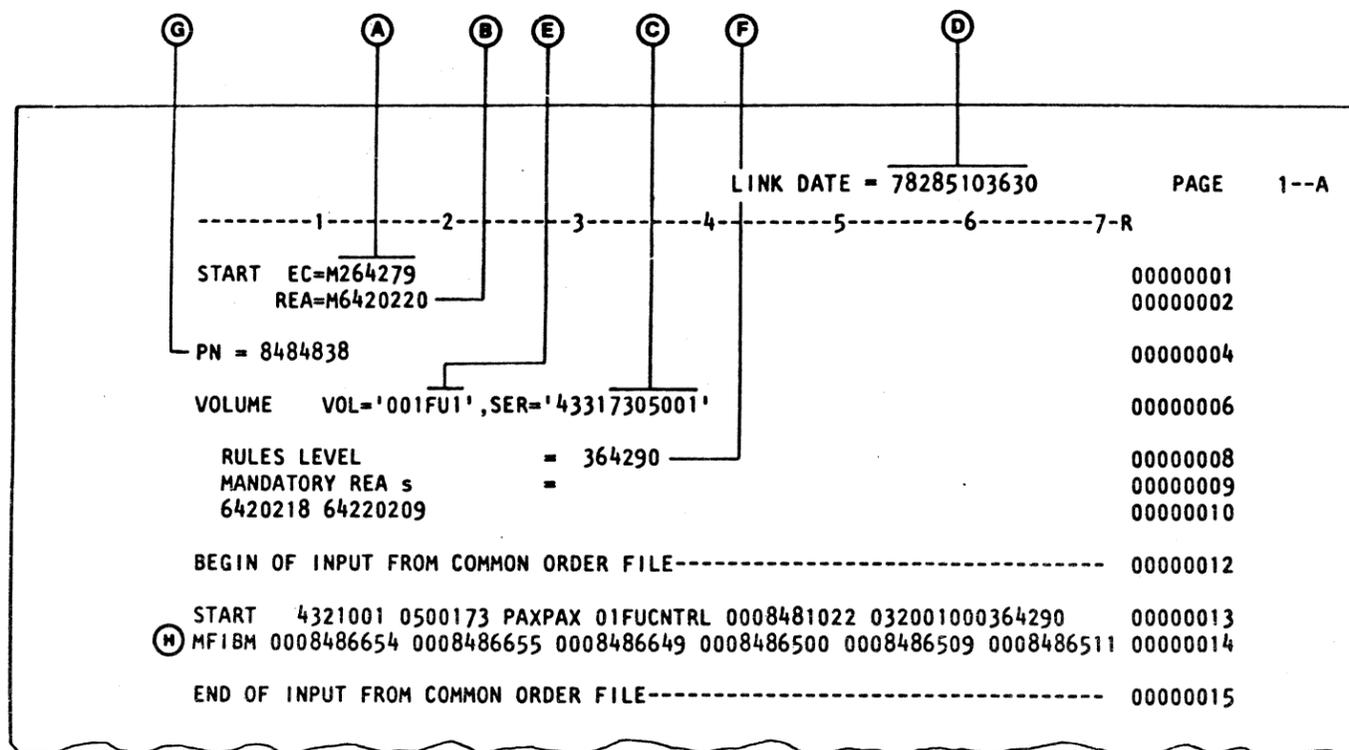


Figure 1: Header page of link list

- (A) EC of link list
- (B) As required REA number
- (C) Machine serial number
- (D) Date and time of link run - Note 1
- (E) FU = Control diskette link list
DD = Diagnostic diskette link list
- (F) EC number of link program
- (G) Part number of link list
- (H) MFI BMs (Feature BMs) installed
(Description on page PA 015, Vol 30)

How to Read the Diskette Label

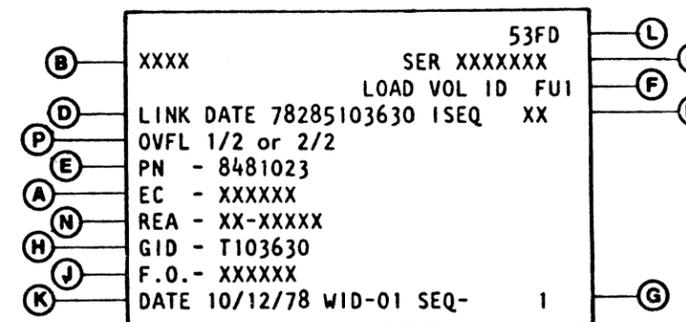


Figure 2: Diskette label

- (A) EC number
- (B) Machine type
- (C) Machine serial number
- (D) Date and time of link run - Note 1
- (E) P/N of diskette
- (F) Load volume continuation sequence number
- (G) Diskette set sequence number
- (H) Generation identifier
- (J) Factory order number
- (K) Diskette writing date
- (L) Diskette drive type
- (M) Installation sequence number
- (N) Latest mandatory REA
- (P) Indicates if an overflow diskette exists and gives number of diskette (1 of 2 or 2 of 2)

Note 1: These numbers must compare between the link list and diskette label.

Diskette Identification

Program Handling - Actions

Purpose

This utility program allows you to display all MFI BMs installed and lists you all REAs and MCTFs installed.

Prerequisite

Any control or diagnostic diskette inserted.

How to Select the Utility Program

1. Call M/S Program Selection A
2. Key in selection for UTILITIES B
3. Select DISKETTE IDENTIFICATION

This selection display offers you three sub-sections:

- M = MFI DISPLAY C
- D = DISKETTE IDENTIFICATION D
- C = DISPLAY CONFIGURATION (see Note)
- L = DISKETTE LINK INFORMATION (see 1 on next page)

4. Enter the appropriate selection, press ENTER.

Note: This selection allows only to display the hardware configurator (no change is possible). It might only be used on request from your support function in cases where problems are expected due to configuration errors.

- A full description is available for the support function in the FSC Manual, Vol. 23.
- For meaning of power configuration bits refer to MI POWER in Vol. 16 subject 'Before Calling for Assistance'.
- See also 'MES Update Without a New Diskette' in Section 6 of this manual.

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4331

STM

Program Handling - Results

Screen displays:

- A IBM MAINTENANCE AND SERVICE PROGRAM SELECTION
- B UTILITIES PROGRAM SELECTION

C * 4331 DISKETTE IDENTIFICATION *
 MODEL: 002 SERIAL NO: 70-50150 FUNCTIONAL DISKETTE 1 EC:
 LINK DATE OF DISKETTE: 79/300/17/35/15
 MFI BM'S USED FOR THIS LINK 041

A

END OF DISPLAY. HIT ENTER TO CONTINUE

- A In this field the actual MFI BM numbers which are used for this link are shown.

D * 4331 DISKETTE IDENTIFICATION *
 MODEL: 002 SERIAL NO.: 70-50150 FUNCTIONAL DISKETTE 1 EC:
 LINK DATE OF DISKETTE: 79/300/17/35/15
 MICRO CODE REA'S INSTALLED NONE
 MCTF'S INSTALLED BY LINK NONE } B
 MANUAL INSTALLED MCTF'S NONE
 MCTF'S INST. BY MCTF DISKETTE NONE
 END OF DISPLAY, HIT ENTER TO CONTINUE

- B Any REAs, or MCTFs installed will be listed in the lines after the header. Instead of the word NONE the actual count of installed REAs, MCTFs is given.

EC 366272 31 Oct 79	EC 366389 13 Mar 81	EC 366390 10 Apr 81	P/N 8488655 Page 1 of 4	4 540	F
------------------------	------------------------	------------------------	----------------------------	-------	---

Diskette Directory Display (continued)

When DESTINATION (A) on previous page) was entered, all IDs are listed with their START- and END Address and their location.

Input (to be keyed-in) for DESTINATION is either:

- PU for Processing Unit 3, or
- SP for Support Processor 4, or
- IO for the processor of the I/O Subsystem.

The location for an ID (Destination PU) is either:

- Control Storage, or
- BSM (Microcode area), or
- Data Storage (Area in BSM, which is usually not used as microcode area).

The location for an ID (Destination SP or IO) is either:

- Data Area, or
 - Instruction Area, or
 - Mixed Area
- } All areas in storage of Subprocessor

If an address is specified in the field WITH/WITHOUT ADDRESS:..... (B) on previous page), the ID(s) which use the specified address are listed with their START and END address and their location.

		DISKETTE DIRECTORY DISPLAY			
		DISKETTE TYPE: 001FU1			
ID= 0100	START ADDR.= 000000	END ADDR.= 001300	DEST.= PU	CONTROL STORE	
ID= 0101	START ADDR.= 001300	END ADDR.= 001460	DEST.= PU	CONTROL STORE	
ID= 0141	START ADDR.= 00A7F8	END ADDR.= 00AE88	DEST.= PU	B S M	
ID= 0142	START ADDR.= 00AE88	END ADDR.= 00B800	DEST.= PU	B S M	
ID= EFOA	START ADDR.= 000000	END ADDR.= 002000	DEST.= PU	DATA STORAGE	
ID= EF10	START ADDR.= 000000	END ADDR.= 0032B0	DEST.= PU	DATA STORAGE	
		DISPLAY COMPLETE, PRESS ENTER TO RESELECT			
MAN		370 TIMER:ON	DATA: 0000	ADDR: 000000	
6062		TOD:SEC			

		DISKETTE DIRECTORY DISPLAY			
		DISKETTE TYPE: 001FU1			
ID= 0003	START ADDR.= 005000	END ADDR.= 005AE0	DEST.= SP	MIXED AREA	
ID= 0007	START ADDR.= 002000	END ADDR.= 006696	DEST.= SP	MIXED AREA	
ID= 0010	START ADDR.= 009800	END ADDR.= 00E85E	DEST.= SP	DATA AREA	
ID= 0011	START ADDR.= 00E880	END ADDR.= 00F200	DEST.= SP	DATA AREA	
ID= 0012	START ADDR.= 00F200	END ADDR.= 00FC00	DEST.= SP	DATA AREA	
ID= 0015	START ADDR.= 008000	END ADDR.= 00FFEA	DEST.= SP	INSTR AREA	
ID= 0020	START ADDR.= 006800	END ADDR.= 006E5C	DEST.= SP	MIXED AREA	
ID= 0051	START ADDR.= 006B00	END ADDR.= 007440	DEST.= SP	MIXED AREA	
		MORE... PRESS ENTER FOR NEXT DISPLAY			
MAN		370 TIMER:ON	DATA: 0000	ADDR: 000000	
6062		TOD:SEC			

		DISKETTE DIRECTORY DISPLAY			
		DISKETTE TYPE: 001FU1			
ID= 0010	START ADDR.= 009800	END ADDR.= 00E85E	DEST.= SP	DATA AREA	
ID= 0015	START ADDR.= 008000	END ADDR.= 00FFEA	DEST.= SP	INSTR AREA	
		DISPLAY COMPLETE, PRESS ENTER TO RESELECT			
MAN		370 TIMER:ON	DATA: 0000	ADDR: 000000	
6062					

Tests for DCA and Attached Devices

Overview

There are six online tests available to test devices attached to the display cluster adapter (DCA) and to display error information for these devices and the DCA. The DCA is part of the support subsystem.

Types of Attached Devices

Displays: IBM 3278, 3279

The displays run under the 3270 protocol.

Terminal Printers: IBM 3230, 3268, 3287

These printers run under the 3270 protocol. They are referred to as terminal printers.

Line Printers: IBM 3262, 3289

These printers do not run under the 3270 protocol.

Purpose of Tests

Test 0 (Zero)

This test checks the communication path between the DCA and the devices attached to it. In addition a type A device is functionally tested.

Test 1

This test displays error statistics for the DCA and attached display units, and printers.

Test 2

Not available.

Test 3

This test displays the type and status (off, on, disabled) for all configured devices.

Test 4

This test resets the DCA and device error logs.

Test 5

Not available.

Test 6

This test displays the device control blocks (DCB) with the extension (DCBE) and the DCA control block (DCACB).

Test 7

This test is only available for the 3279 color display unit. It allows to converge the screen. The test can be selected only for one device at the time.

The online tests can be executed concurrent to the customer operation for all devices attached to port 1-15. For the operator console (port 0) the tests are only supported if the system is in MAN OP mode. To execute the tests enter TEST mode.

How to Invoke and Leave Test Mode

Port 1-15

Hold down the ALT key and press the TEST key.

Port 0

On line tests on the operator's console can be run only when the console is in manual operation state (MAN OP displayed on line 25). When your system has the color console installed and another display (port 1-15) is using Test 7 (color convergence) the message 'CONVERGENCE ON PORT NN' is displayed on line 23. If this message is displayed, consult the user of Test 7 before forcing manual operation state as this ends the Test 7 running on the other display, storing the convergence data completed so far. Other online tests are unaffected by entering manual operation state. Regardless whether your operator's console is a 3278-2A or 3279-2C, use the following procedure to run any online test:

1. Press CHG DPLY key.
If MAN OP appears on line 23, go to step 3.
2. If 'MODE-SEL CANCELS CONV!' appears on line 23, either press the CHG DPLY key and continue with other work (in which case the information message 'CONVERGENCE ON PORT NN' re-appears) or force MAN OP as follows:
 - a. Press MODE SEL key. The mode selection screen appears and the convergence test on the other display is terminated.

- b. Press CHG DPLY. The previous user screen appears.
 - c. Press CHG DPLY again. MAN OP appears on line 25.
3. Hold down ALT key, press the COPY key, and release both keys. TEST appears on line 25.

To return to MAN OP mode on the OP-console repeat step 3 then step 2c. For any other display hold down the ALT key and press the TEST key.

To select a test enter the request message in the following form:

NN/n ENTER

NN = Port number of tested device
n = number of test

Any test request message must be delimited by at least one blank or empty (X'00') position. An empty position is entered by moving the cursor. If NN is omitted the test is executed on the display you entered the request.

Hitting any key which is not required for test operation will return input inhibited minus function indicator (XC - f). The same result is achieved by requesting an invalid test function (for example, Test 6 for a not configured device).

Test 0

Overview

This test performs the following functions:

- Transmits a test pattern to the requesting display and uses this test pattern to test certain functions. For details refer to the I/O maintenance manual.
- Executes a communication path test to the DCA attached printers.

Test 0 Request for a Display Unit

If Test 0 is requested for a display unit a test pattern is transmitted from the support processor to the display unit. This display unit may be the one from which the test was requested or if a port was specified with the request message the unit attached to this port. The test will be executed except under the following conditions:

- If requested for port 0 (operator console), the test pattern function is not performed. Input inhibited minus function indication is returned. For Test 0 on the operator console see 'How to Request Test 0' on next page.
- If the device is busy (executing a command that

Test 0 Request for a Printer

If the test is requested for a DCA attached printer only the communication path test is executed, to check continuity of the coax cable.

Device Error Information Display (continued)

Line 1

This line is returned exactly as you entered your request.

Example

You entered 0/1 and the first line of the display sent back to you should be 01/1.

Line 2

This line displays the current low order digits of 200 series error numbers. If there are no errors generating 2NN numbers, the second line of this display will appear as follows:

0000 0000

If error information had been recorded, the second line of this display could appear as follows:

0400 0000

04 = The most recent 200 series error, in this example 204, which is a device check. The 200 numbers appear in the leftmost position. The rest is always '0'.

Line 3

This line displays the statistical counter information associated with this device. If there are no errors recorded for this device, the counters will display as follows:

0000 0000 0000

┌ ┌

Counter 01 Counter 06

The counters are not numbered when they are displayed. However, each byte represents a defined counter. The leftmost byte represents counter number 01 and the rightmost byte is counter number 06. The value in each counter is given in hexadecimal. If errors were being recorded for this device, the display for line 3 could appear as follows:

02FF 1A00 0013

Counter Number 01 = X'02' = 02 Errors Total
 Counter Number 02 = X'FF' = 255 Errors (Maximum)
 Counter Number 03 = X'1A' = 26 Errors Total
 Counter Number 04 = X'00' = No Errors
 Counter Number 05 = X'00' = No Errors
 Counter Number 06 = X'13' = 19 Errors Total

The counter numbers are assigned specific meaning according to the device for which the error information is requested. The counter meanings for the different device types are listed in the following table.

Meaning of Error Information Counters

Line Printer and Terminal Printer		Display Unit
Cntr.	Meaning	Meaning
01 *	Coax Timeouts	Coax Timeouts
02	Coax Parity Errors	Coax Parity Errors
03 *	32nd Poll Timeout	32nd Poll Timeout
04	Device Checks	Device Checks
05	Error Status	Error Status
06	Equipment Check	Not used

* Both timeouts will be updated when a device is powered off or the Test/Normal switch is operated. This is not an error condition.

DCA Error Information Display

The DCA error information is accessed by using A1/1 test request message. The information returned consists of the last 2NN number recorded, the basic adapter status information at the time of the failure, and statistical counters similar to the device error counters. The error statistical information can be used to determine:

1. What is the frequency of errors
2. What was the adapter doing at the time of error
3. How did the operation end, etc.

How to Interpret the Test Display

Line 1

Returned the same as input, A1/1.

Line 2

Four (4) bytes are displayed on this line; however, only three are currently used. The individual bytes are not labeled when displayed. Each byte is assigned a specific meaning. See the example below for byte identification:

0000 0000
 NNXX SSSS

The leftmost byte is labeled NN. This code represents the two low-order digits of any 200 series error number.

The next byte to the right of NN is XX, which is always 00 and not used.

The next two bytes to the right of XX are labeled SSSS and represent the adapter status associated with the last failure. See the following table:

DESCRIPTION	BIT	MEANING IF BIT IS TURNED ON
Left SS Byte	0	Counter Overflow
	1	Read Time Out
	2	Turnaround or Read Line Parity Error
	3	Read Data Byte Parity Error
	4	Stop Poll
	5	Timer
	6	Error Q Entry
Right SS Byte	7	Not Used
	0	Extended Status Set
	1	Command Completed
	2	Adapter Active
	3	Keystroke or Status Q Entry
	4	Not Used
	5	Machine Check
6	Enable / Disable	
7	Interrupt	

Display Units and Terminal Printers (continued)

Byte	Meaning
20,21	Current cursor address in hex
22,23	Control flags for the DCA interface. Meaning if bit is set to 1: Byte 22: Bit 0: RAS or TEST mode 1: Data transfer pending 2: Inhibit keyboard entries 3: Keyboard locked due to system key 4: Attribute information invalid 5: Cursor on attribute 6: Upshift lock 7: Auto shift Note: Bit 2 is always on in case of test 6 to same device. Byte 23: Bit 0: Device busy 1: Keystroke being processed 2: Numeric lock active 3: Insert mode 4: Status available 5: Read terminal status pending 6: Status queue response expected 7: CMD queue initiated
24,25	DCA error status
26	Error queue entry
27	Keystroke queue entry
28	Interface condition indicator
29	Reserved
2A	3287 status
2B	Status queue entry
2C	Status area for display unit
2D	Most recent error event of the device
2E	Control register in case of display unit

Byte	Meaning
2F	Reserved
30,31	Screen boundary in hex notation
32,33	Address of DCB extension
34,35	Current buffer address
36,37	Translate table address
38,39	Command start address
3A,3B	Flags for device specific operation. Information if bit is set to 1: Byte 3A: bit 0: Device waiting for BBA interrupt 1: Device waiting for DCA interrupt 2: Last /370 CCW command was an immediate one 3: Channel End presented, Device End pending 4: Buffer swap pending 5: MODE SELECT pending 6: Data for chained CCW expected 7: Command decode active Byte 3B: Bit 0: 1052 emulator - CMD X'01' 1: 1052 emulator - READ outstanding 2-4: Reserved 5: Copy in MAN OP mode ended 6: Reset initiated by BBA 7: Waiting for device reset
3C,3D	Remote support flags
3E-3F	Reserved

Line Printers

Byte	Meaning
19	Sense Byte 1 contains Byte 18 (Status code) of the printer sense bytes. See 'Printer Sense Bytes' at the end of this table.
1A,1B	The address of the command queue used in processing of /370 commands for this device associated with the user program.
1C-21	Reserved
22-2b	Same as for 3278
2C	3289-E device status
2D	Most recent device error event
2E,2F	Address of entry point for BBA requests
30,31	Address of entry point for DCA requests
32,33	Address of DCB extension
34-3B	Save area
3C	Status byte of 'A'-device
3D	Timer count for 1 CCW
3E,3F	Address of SENSE byte area

DCB Extension (continued)

Byte	Meaning
2A	Information about ownership of currently executing command queue. Owner if bit is set to 1: Bit 0: Manual operation request 1: DCA level request 2: DCA level - READ STATUS request only 3: 3289-E level 4: 3278, 3279 or 3287 level request 5: RAS preparation level request 6: RAS level request 7: Reserved
2B	Information about ownership of next command queue. The same flags are set as in byte 2A.
2C,2D	Address of indicator row
2E-39	Save area
3A,3B	If Canadian French: Information about dead keys If Katakana: Shift mode to be restored
3C	Command queue retry count
3D	Reserved
3E,3F	Color control block address

DCA Control Block Display - Byte 0 to X'3F'

The DCA Control Block (DCACB) is displayed in TEST mode by entering the sequence A1/6 ENTER in line 1 of the display. There will be six lines displayed. The first line is as the input (A1/6). The second line shows the DCACB start address. Lines 3 to 6 reflect the DCACB, following the pattern outlined under Test 6, Byte Number Chart.

Byte	Meaning
00	Support processor bus address of the DCA
01	Reserved
02,03	Status of the DCA
04,05	DCA control flags. Information if bit set to 1: Byte 04: Bit 0: Command queue active on DCA 1-3: Reserved 4: Interface condition queue to dispatch 5: Keystroke entries into stack 6: Dispatch 'clear keystroke stack' indicator 7: READ STATUS command queue to start Byte 05: Bit 0: Overflow of over 63 queue counter 1-7: Reserved
06,07	Address of a routine which scans for service requests
08	Counter for DCA timer interrupts
09	DCA request byte
0A,0B	Address of error queue 1
0C,0D	Address of status queue 1
0E,0F	Address of keystroke queue 1
10,11	Cycle steal control information
12,13	Address of error queue 2
14,15	Address of status queue 2

Byte	Meaning
16,17	Address of keystroke queue 2
18,19	Address of inactive error queue start
1A,1B	Address of inactive error queue end
1C,1D	Address of inactive status queue start
1E,1F	Address of inactive status queue end
20,21	Address of inactive key queue start
22,23	Address of inactive key queue end
24,25	Address of the DCB for the device, for which a command queue is initiated.
26,27	Address of the initiated command queue
28,29	Address of the initiated data queue
2A,2B	Save area
2C,2D	Address of DCB address table in port sequence
2E,2F	Address of indicator row control table
30,31	Address of first NDS device control block
32	Most recent DCA error
33	Reserved
34,35	DCA basic status at error event
36,37	Address of timer request halfword
38,39	Transient request halfword
3A,3B	Test 7 requestor base address
3C,3D	Power up convergence requests
3E,3F	Reserved

SP Trace

SP Trace Handling - Actions

Prerequisites:

- Power on or Power incomplete light

How to Select the Trace

- Set the CE mode switch on the CE panel to ON.
- Press the three function keys A, B, and C on the CE panel at the same time **A**.

How to Terminate the Trace

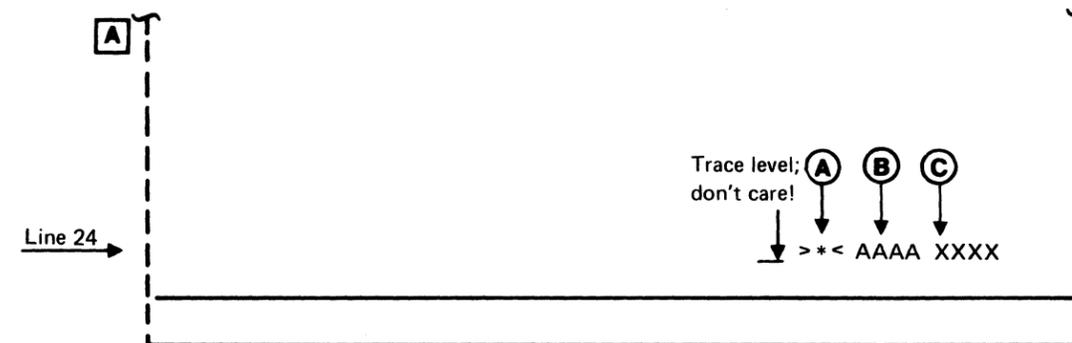
- Key in function 'Z', press ENTER.
- Set CE mode switch to OFF.

Lamp Test for SP Display Indicators

CAUTION: Do not use this procedure when any system activity is in progress (for example, customer job or diagnostic test is running) or when the machine is in an error hang (for example, dead system).

1. Perform IML with the control or diagnostic diskette (if not already done).
2. Set the display switch on the CE panel to 'ON'.
3. Select the SP Trace (A, B, C key on the CE panel).
4. Key in function C and data FFFF. Press ENTER. (Display on screen: >C< FFFF *RUN*)
5. Press function key B on the CE panel. All LEDs should light.
6. Select the SP Trace again.
7. Key in function C and data 0000. Press ENTER. (Display on screen: >C< 0000 *RUN*)
8. Press function key B on the CE panel. All LEDs should be dark.
9. Select the SP Trace again.
10. Key in function Z. Press ENTER.

SP Trace Handling - Results



A Function to be selected

FUNCTION	EXPLANATION
D, Press ENTER	Display Storage
E, Every time when ENTER is pressed the next even storage position is displayed.	Display storage (address +2)
Z, Press ENTER	Switch off the TRACE

B Key in the address of the storage position you are told to display by the MAPs. If an odd address is keyed in, it will change to the even address just before the odd one when pressing ENTER.

C This is the displayed data received from the addressed storage position.
CAUTION: If you insert an odd address the second byte of the displayed data is the one belonging to the odd address.

For example: >D<2021 XXXX
 after ENTER
 >D<2020 8AC1

Messages that Appear on Screen

Message	LOG	TEST	TOOL	Reset Condition
REFERENCE CODE	By log-in program	By analysis part of test program		By system reset or IML or next log
STARTED		Appears when the ENTER key is pressed first time to start a test.		
RUNNING		Appears when a test is running.		
STOPPED		Appears when the ENTER key is pressed a second time to stop the test. Stop occurs only at routine end.		
ANSWER	Appears on the screen when an CE intervention is required.	Intervention required at device under test.		
INVALID	Wrong handling Caused by an invalid selection	Wrong handling Caused by an invalid selection of an adapter or a test routine	Wrong handling Caused by an invalid selection	Repeat the handling
LOOPING		Displayed as long as a test loops.		
ERROR		Any machine malfunction or intervention required at device under test but due to an error.	Machine malfunction (If manual operation selected, disable it.)	
LOADING	Appears when the control program is loaded into the processors during IML.			
CHECKSTOP	If an irrecoverable error condition is detected or if 'Stop before Log' becomes active. 1. PSW was disabled 2. Hard stop mode or 'stop before log' is active. 3. More than one log with the same unit type was requested in one log process. EXCEPTION: MPX/ BMPX allow a higher number of logs in the same log process to support Operating System Recovery. 4. The PU has stopped after a log was taken. 5. The error was not recoverable.			By System Reset or IML

Supplement to MAPS, Section 5: Diskette Drive Maintenance Information

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MACHINE CHARACTERISTICS

060 Electrical Characteristics

The host system, or device, supplies all power to operate the diskette drive, which includes:

- DC voltage for the diskette drive control card:

Logic Voltage (DC)	Maximum Operating Current
- 5 V	0.10A
+ 5 V	0.80A
+24 V	0.59A

- One of the following AC voltages

60 Hz, single phase AC power:

Input Voltage (AC)	Average Operating Current
200V	0.55V
208V	0.55V
230V	0.55V

50 Hz, single phase AC power:

Input Voltage (AC)	Average Operating Current
200V	0.55V
220V	0.55V
235V	0.55V

Note: All voltage tolerances are 10% except the + 24 Vdc which has a tolerance of 12%.

080 Functional Characteristics

Diskette data formatting gives the diskette drive the following characteristics:

- Data capacity (in formatted data bytes):

	Diskette 1	Diskette 2	Diskette 2D
128 Bytes per Sector	242,944*	492,544**	
256 Bytes per Sector	284,160	568,320	985,088***
512 Bytes per Sector	303,104	606,208	1,136,640
1024 Bytes per Sector			1,212,416

- * Basic data exchange for a diskette 1
- ** Basic data exchange for a diskette 2
- *** Basic data exchange for a diskette 2D

- Data rate: 250,000 bits (31,250 bytes) per second (FM); 500,000 bits (62,500 bytes) per second (MFM)
- Cylinder to cylinder seek time: 5 ms plus 35 ms for the head/carriage assembly to stop. (The total seek time is the number of cylinders the heads moved across multiplied by 5 ms plus 35 ms).
- Tracks per diskette side: 77 (Cylinder 00 is the label cylinder; cylinders 01 through 74 are for data; cylinders 75 and 76 are reserved as alternative cylinders).

Note: On some systems cylinder 74 is reserved for alternative sector relocation.

- Sectors per track:

FM	MFM	
26	12	128 bytes per sector
15	26	256 bytes per sector
8	15	512 bytes per sector
8	8	1024 bytes per sector

For functional characteristic details on the diskette refer to 'The IBM Diskette General Information Manual', GA21-9182

DISKETTE DRIVE PARTS

130 Parts Location

Cover Assembly (420 through 470)

- A** Latch assembly (440 and 450)
- B** Collet (460 and 470)

Open the diskette drive cover assembly to insert a diskette. The collet centers and holds the diskette against the drive hub when the cover is closed.

AC Drive Parts (560 through 650)

- G** Belt (560 through 590)
- E** Drive motor (600 and 610)
- L** Drive pulley (620 and 630)
- H** Idler assembly (640 and 650)

The AC drive parts turn the diskette at 360 rpm.

Stepper Drive Parts (680 through 780)

- K** Stepper motor (680 and 690)
- R** Stepper motor pulley (700 and 710)
- S** Stepper motor pulley clamp (700 and 710)
- P** Stepper drive band (730 through 760)
- L** Drive band idler assembly (770 and 780)

The stepper motor shaft turns in either direction under control of access pulses.

The stepper drive parts move the heads across the diskette surface.

Read/Write Parts

- N** Head/Carriage Assembly (480 through 510)

Two read/write heads, which are mounted on a common carriage, move under control of the stepper motor. The read/write heads perform the read, write, and erase functions of the diskette drive.

Head Load Parts

- D** Solenoid (520 through 550)
- O** Bail (520 through 550)

The head load solenoid causes the bail to load the heads.

Index Detection Parts

- M** LED (800 through 830)
- C** PTX (800 and 840 through 860)

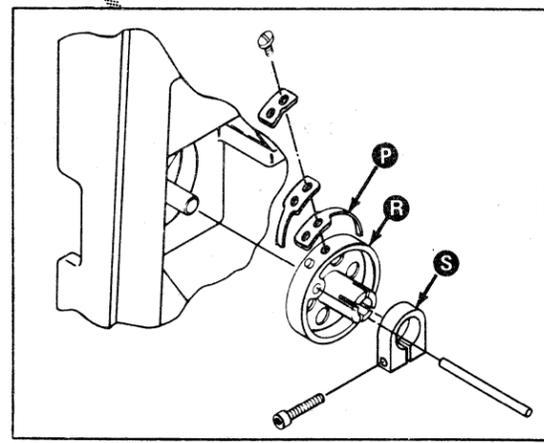
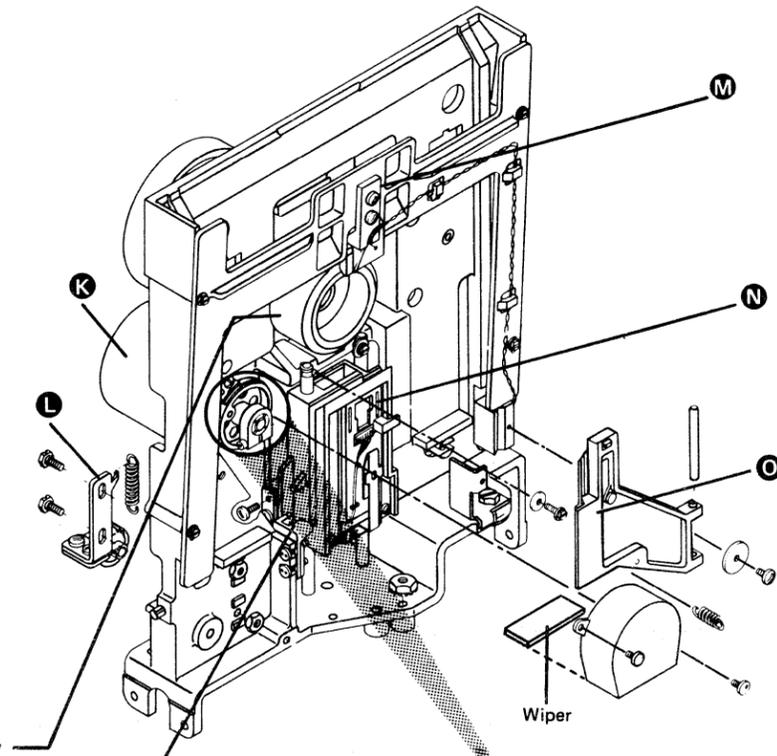
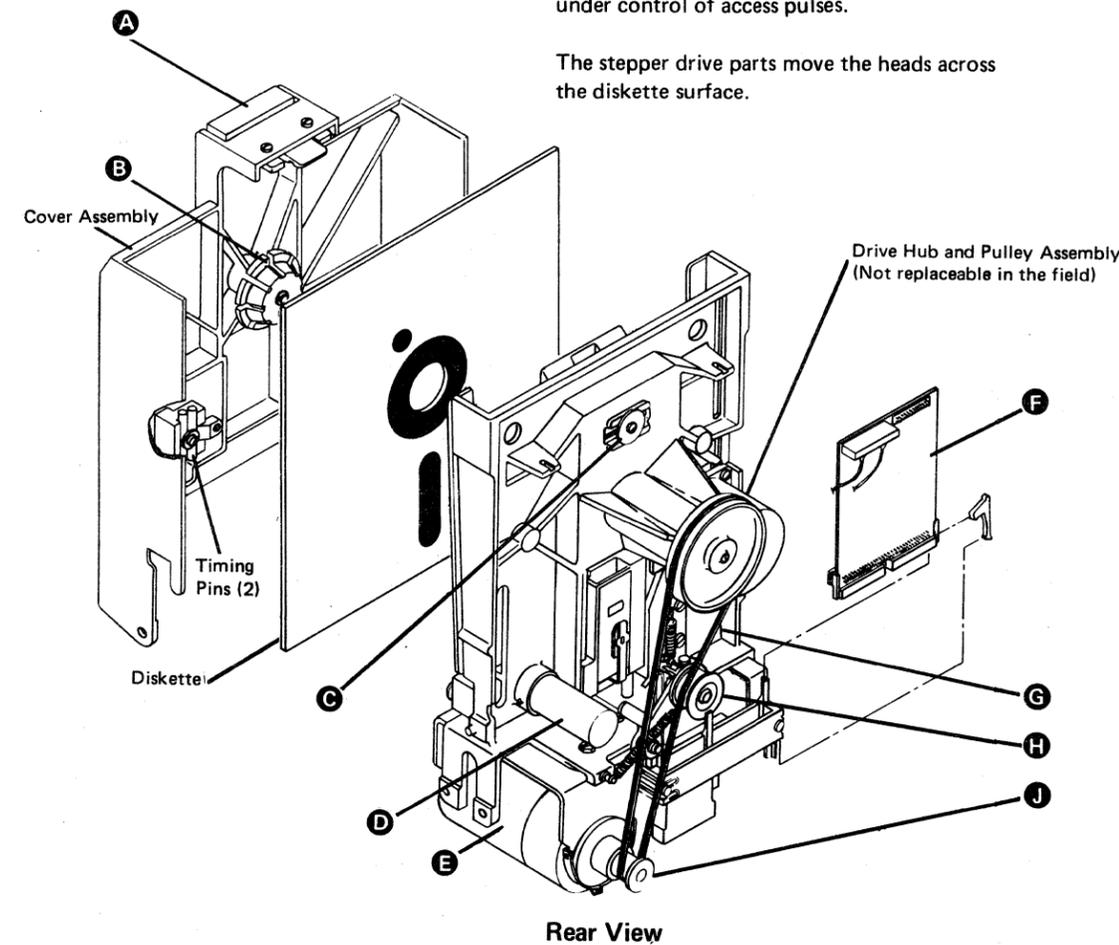
The LED (the light source) and the PTX (the light sensing device) work together to detect the diskette index.

Diskette Drive Control Card

- F** 53FD (870 through 920)

The diskette drive control card has the drive circuits for the stepper motor, the head load solenoid, and the write and erase functions. This control card also has the amplifiers for the read heads and the index sensing circuits.

Note: Different control card versions are shipped. Refer to 890 to verify which card version is plugged in your diskette drive.

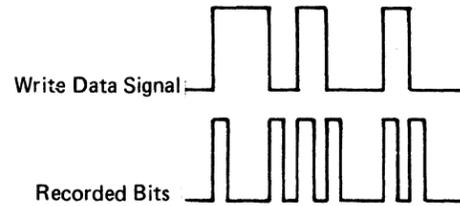


EC 366234 29 June 79	EC 366345 15 Feb 80	EC 366388 23 Jan 81	P/N 8488440 Page 5 of 12	5 005 F
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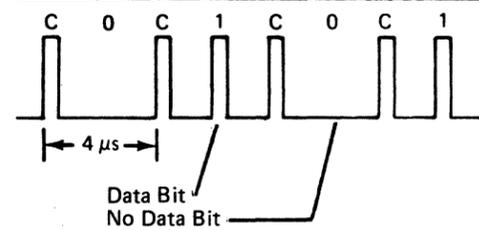
170 Read/Write Principles

Write Data

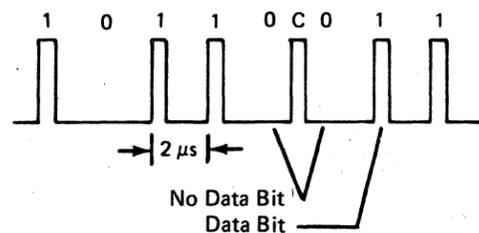
For each change of the write data signal, the current switches in the read/write head. This process records the data on the diskette surface.



In FM encoding, the time between clock pulses is 4 μ s. Both a clock bit and either a data bit for a 1 or no data bit for a 0 are recorded within this 4 μ s period.



In MFM encoding, the constant clock pulse is removed. A clock bit is recorded only when a 0 (no data bit) is followed by a 0. Therefore, the time between data bits is 2 μ s. Either a data bit for a 1 or no data bit for a 0 is recorded within this 2 μ s period.



Read Data

- The sine wave signal for FM encoding is:
 - 125 kHz: 13 to 560 mV (all 0's)
 - 250 kHz: 6.5 to 420 mV (all 1's)
- The sine wave signal for MFM encoding is:
 - 125 kHz: 13 to 560 mV (alternate 0's and 1's)
 - 250 kHz: 6.5 to 420 mV (all 0's or all 1's)

The voltage is higher at the outer tracks because of the higher track speeds and lower bit density.

For FM, an all 0's pattern has a higher voltage amplitude than an all 1's pattern.

For MFM, an alternate 0's and 1's pattern has a higher voltage amplitude and is half the frequency of an all 0's or all 1's pattern.

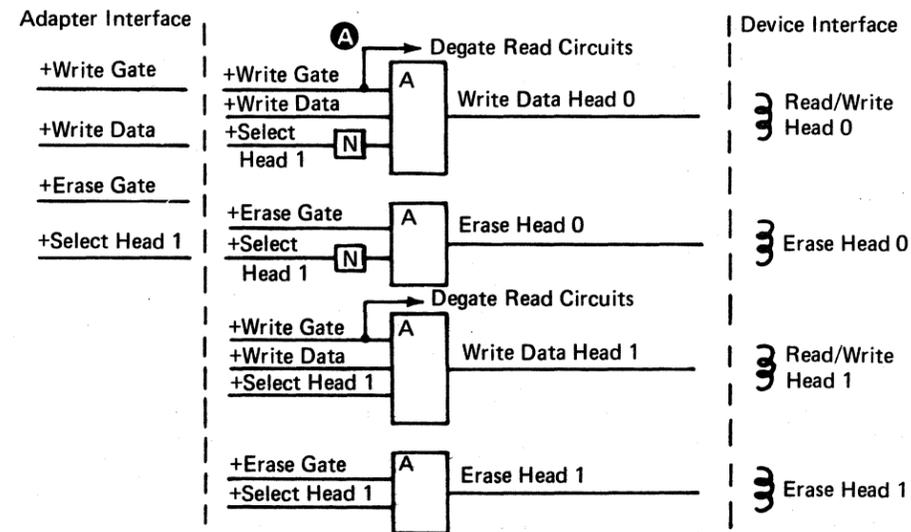
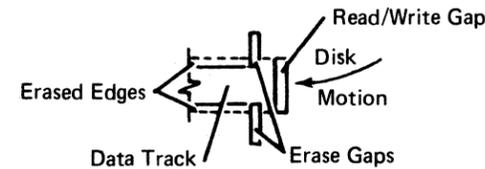
File Data

File data is a series of clock and data pulses that represent the read data. These pulses are 150 to 500 ns in duration and are sent to the VFO circuits for separation of the clock and the data pulses.

Write Operation

For a write operation, write gate activates the write circuits and deactivates the read circuits as shown **A**.

Erase gate is active during a write operation to erase the edges of the data track just recorded. This erasing process prevents crosstalk between tracks during later read operations.



Format Write Operation

The format write operation writes a full track replacing all the ID (identifier) fields, data fields, and gaps. The index to first ID field gap is 73 (146 for MFM) 8-bit bytes.

Write gate is activated within 50 (100 for MFM) bytes from the leading edge of the index pulse **B**. Write gate is deactivated within 51 (102 for MFM) bytes after the leading edge of the next index pulse **C**.

Erase gate is activated the same time as write gate. However, erase gate is deactivated 537 μ s after write gate is deactivated **D**.

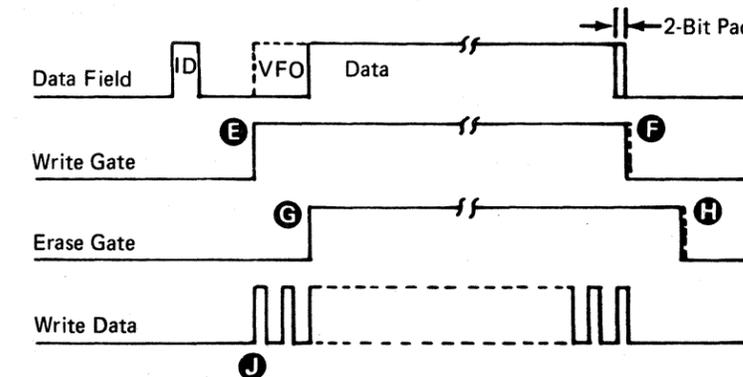
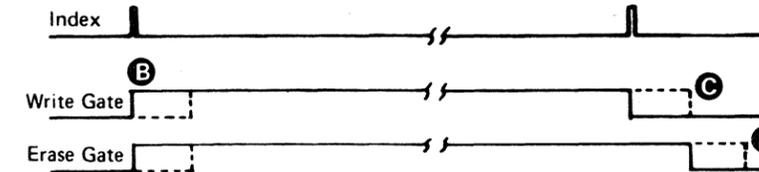
Record (Update) Write Operation

Update operations are performed on a data field and its VFO sync field only. ID fields and gaps are not written.

Write gate is activated within 237 μ s after the last ID character is read **E**. Write gate is deactivated within 5 μ s after the last clock of the 2-bit pad is written **F**.

Erase gate is activated 537 μ s after write gate **G** and is deactivated 537 μ s after the fall of write gate **H**.

The new VFO sync field begins when write gate is activated **J**.

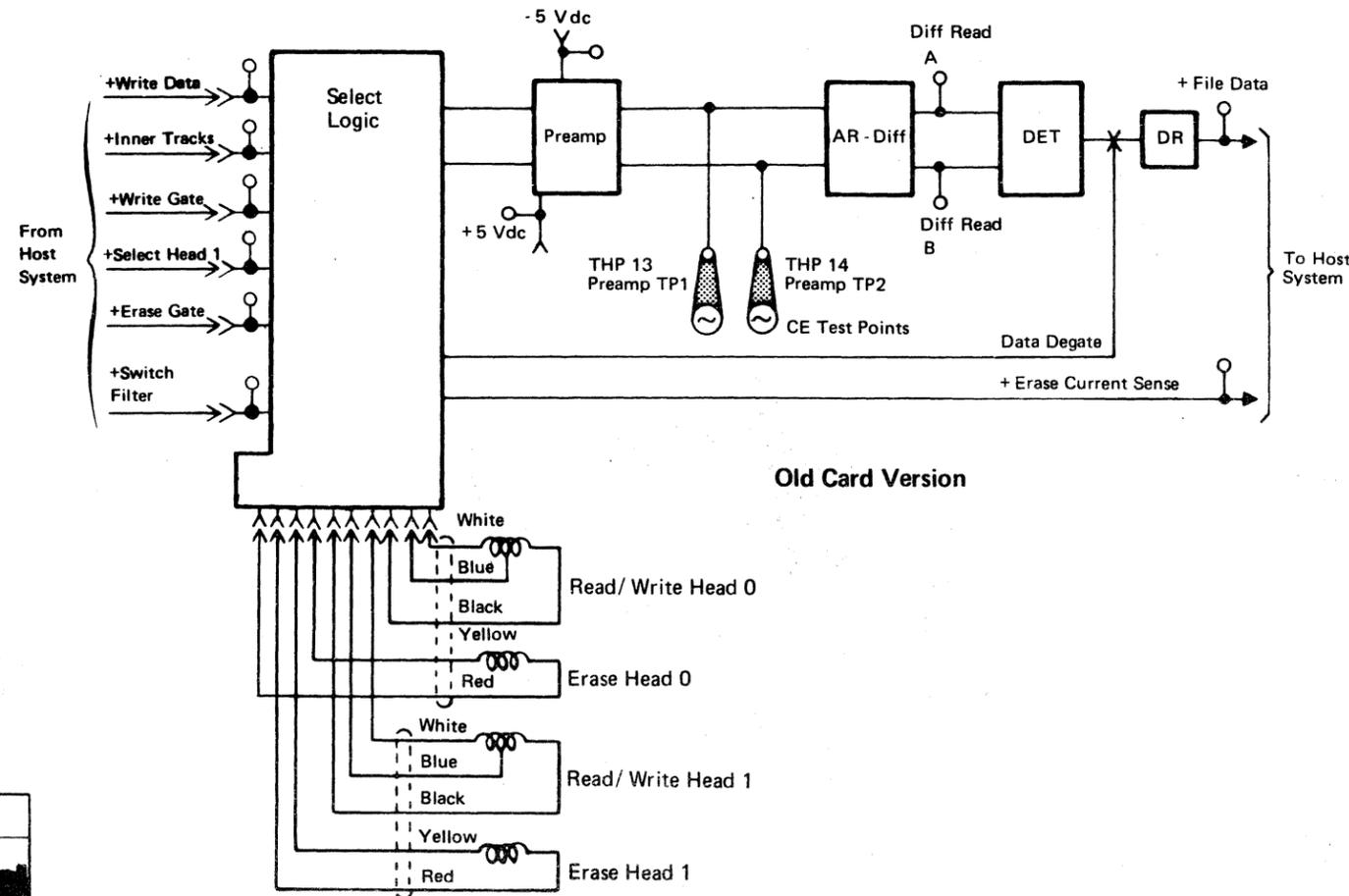


190 MFM Scoping Charts

Note: Use Tektronix 453, 454, or similar oscilloscope with x10 probes.

Channel A sweep mode	Normal
Channel A level	+
Channel A coupling	dc
Channel A slope	+
Channel A source	External
Trigger Mode	Normal
Channel 1 volts/division	5 mV/cm
Channel 2 volts/division	5 mV/cm
Channel 1 input	ac
Channel 2 input	ac
Invert	Pull out
Times per division	2ms/cm
Connect channel 1 to	Preamp TP1 A
Connect channel 2 to	Preamp TP2 B
Connect trigger to	+Index test pin C

Observe: The amplitude of the read signal should be between 6.5 to 560 mV.

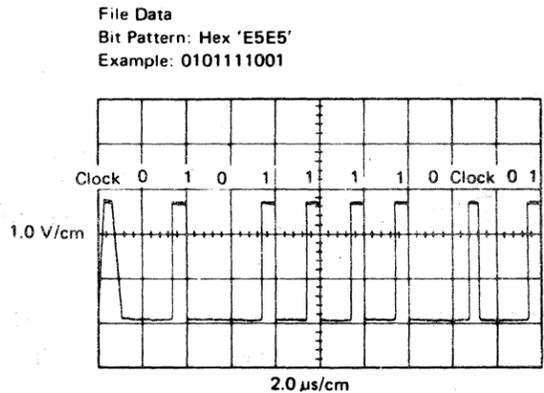
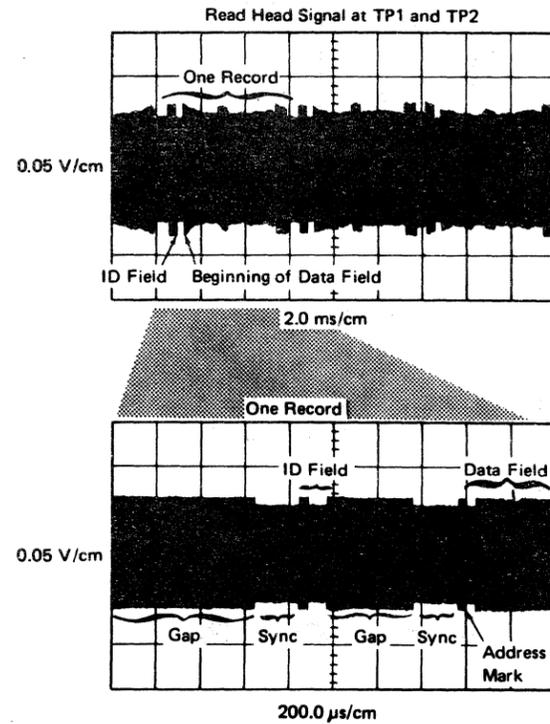


Old Card Version

Note: Use Tektronix 453, 454, or similar oscilloscope with x10 probes.

Channel A sweep mode	Normal
Channel A level	+
Channel A coupling	dc
Channel A slope	+
Channel A source	External
Trigger Mode	Normal
Channel 1 volts/division	1.0 V/cm
Channel 1 input	dc
Times per division	2 us/cm
Connect channel 1 to	+File data D
Connect trigger to	+Index test pin C

Observe: Clock or data pulses every 2 to 4 μ s. Pulse duration should be between 100 and 500 ns. Pulse amplitude should be between 2.4 and 4.2 volts.



KEY	SIGNAL	PIN
A	PREAMP TP1	THP13
B	PREAMP TP2	THP14
C	+INDEX	TPB9
D	+FILE DATA	TPB5

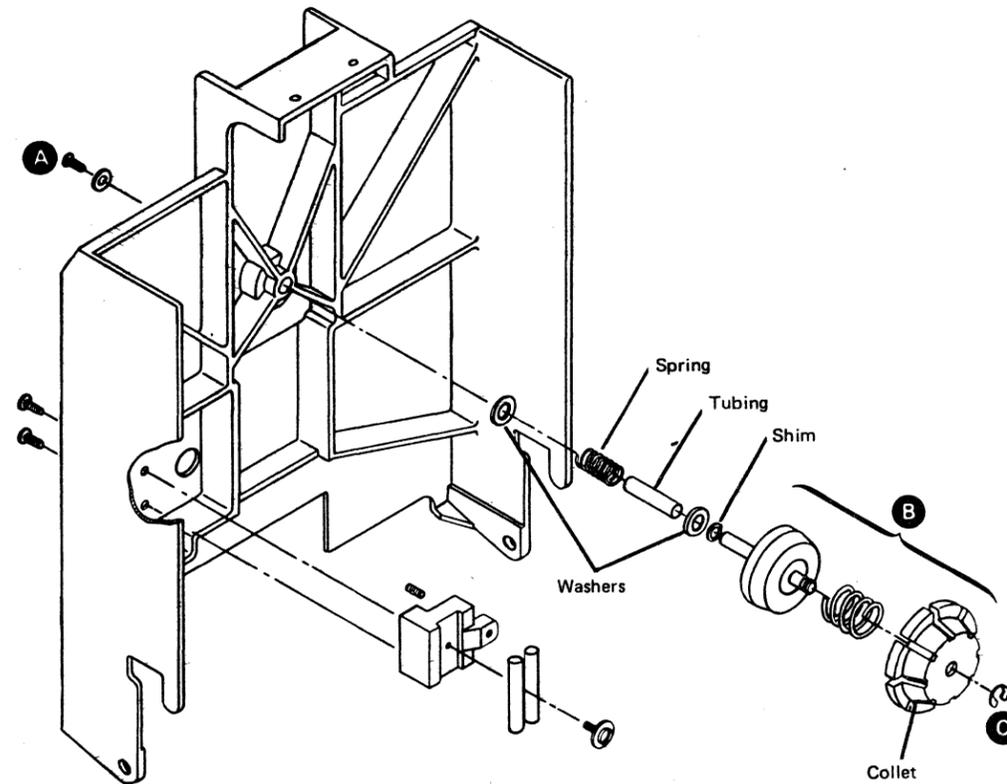
Note: See paragraph 890 for test pin locations

460 Collet Removal

1. Remove the diskette drive cover assembly (refer to 420).
2. Remove the mounting screw **A**.
3. Remove the collect assembly **B** along with the parts on the collet assembly shaft.
4. Remove the clip **C** and the collet.
5. Inspect all parts for wear and install new parts as needed.

470 Collet Replacement

1. Reinstall the collet and the clip **C**.
2. Reinstall the remaining parts on the collet assembly shaft in the order shown.
3. Reinstall the collet assembly **B** and the mounting screw **A**.
4. Reinstall the diskette drive cover assembly (refer to 430).



490 Head/Carriage Adjustment

CAUTION

The head/carriage assembly adjustment must be performed with the diskette drive installed (or in the same position as when installed) or the adjustment might not be accurately made.

1. Power off.
2. Remove the diskette drive cover assembly (refer to 420).
3. Remove the wiper assembly **F**.
4. Insert a strip of clean paper between the heads to prevent the head surfaces from touching.
5. Measure and record the gap **B** between the stepper motor pulley and the casting.

Gap is: _____
6. Loosen the clamp screw **C** so the stepper motor shaft can turn inside the pulley.
7. Turn the stepper motor pulley by hand to cylinder 40 and insert a timing pin **E**.
8. Disconnect the drive motor power cable.

DANGER

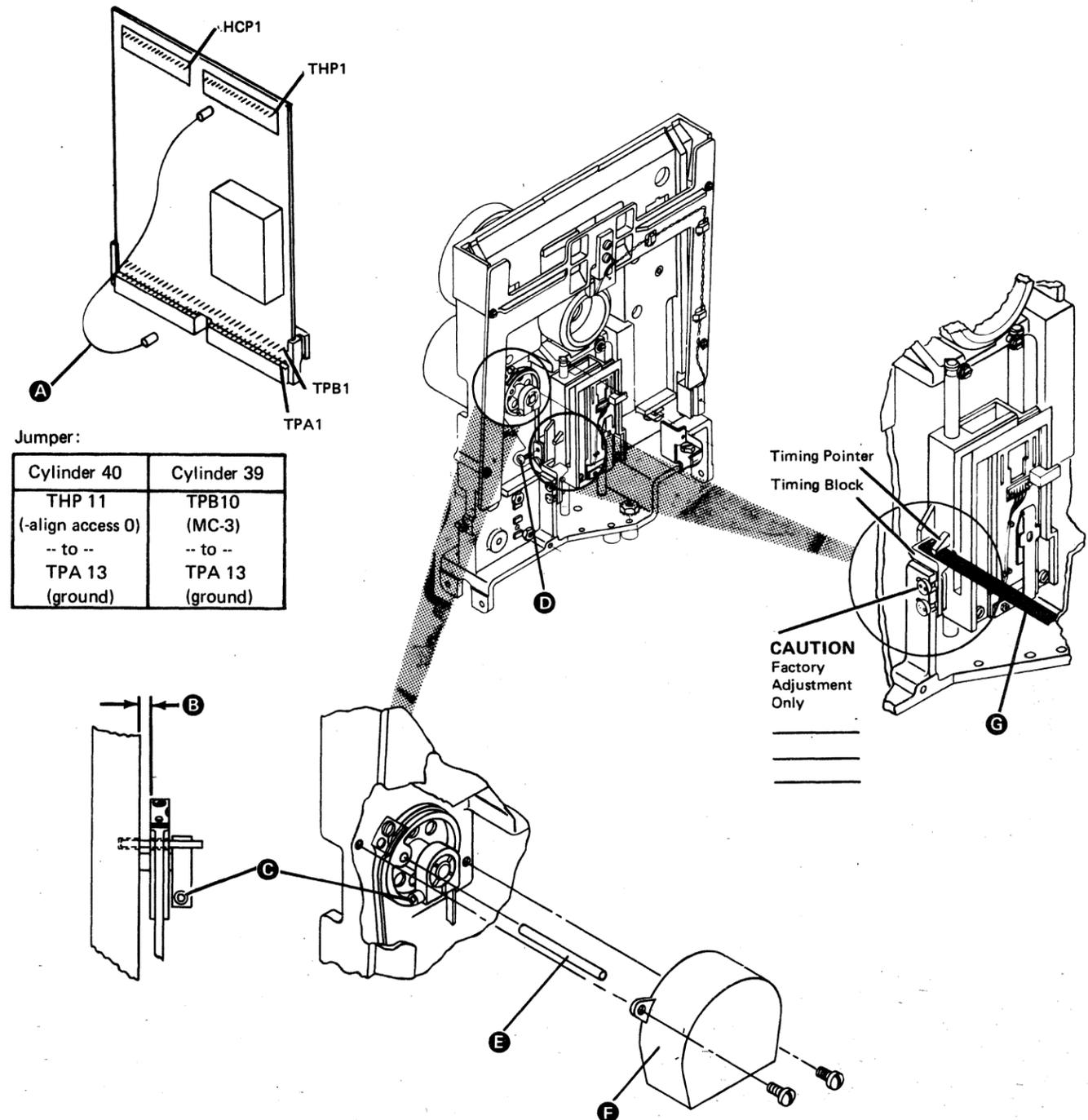
Voltage is still present at the socket when the power cable is disconnected.

9. Power on.

WARNING

To do the following procedure correctly, make sure the access lines are not active and cannot be activated by an external source.

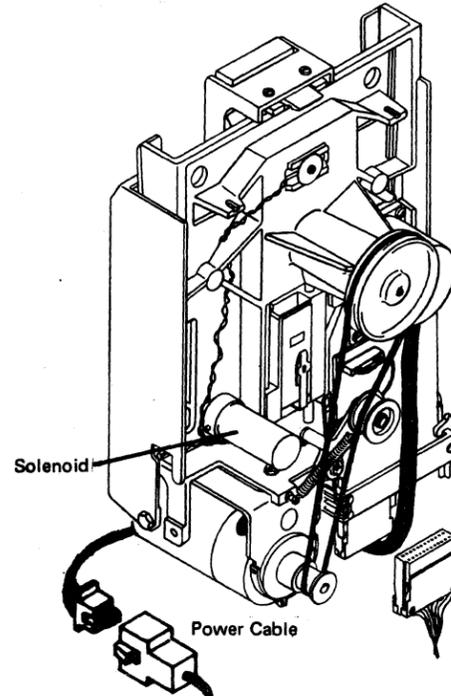
10. Install a jumper **A** from TPA13 (ground) to THP11 (-align access 0).
11. Make the gap **B** the same size as the gap recorded in step 5 and tighten the clamp screw **C**. (Ensure that the timing pin passes freely through the stepper motor pulley into the timing slot in the casting.)
12. Remove the timing pin **E**.
13. Loosen the two band clamping screws **D**.
14. Remove the jumper end from THP11. Then install the jumper end to TPB10 (MC-3).
15. Remove the jumper end from TPB10. Then install the jumper end to THP11 (-align access 0).
16. Verify that this is cylinder 40 by visually checking that the timing hole in the pulley lines up with the timing slot in the casting. (Do not use a timing pin.)
17. Insert a 0.020 thickness gauge **G** between the timing pointer and the timing block. (Put light finger pressure to the top of the carriage to hold the thickness gauge in place.)
18. Tighten the band clamping screws **D**. (Ensure that the drive band is straight.)
19. Go to 480, step 11.



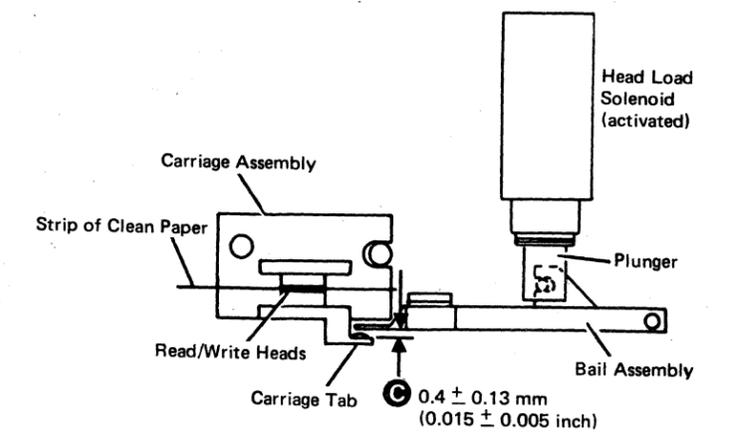
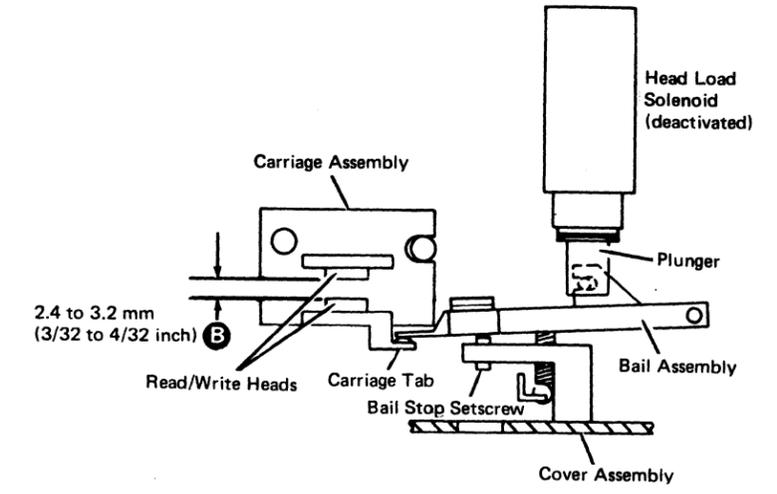
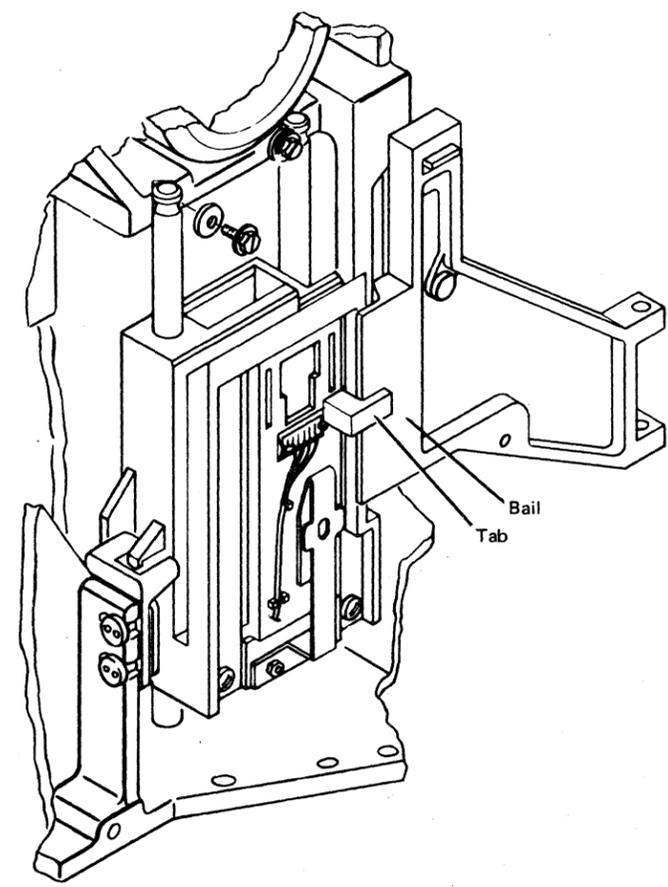
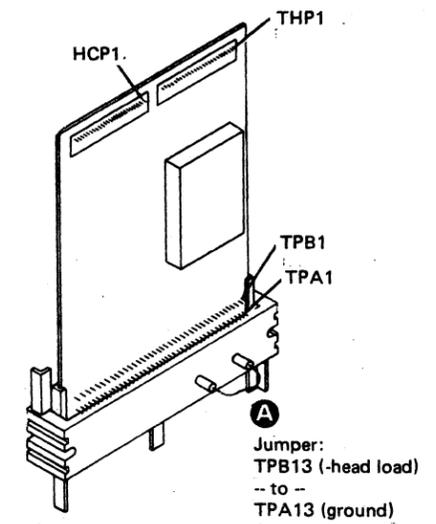
HEAD LOAD SOLENOID AND BAIL

520 Solenoid and Bail Service Check

1. Power off.
 2. Disconnect the drive motor power cable.
- DANGER**
Voltage is still present at the socket when the power cable is disconnected.
3. Remove the diskette drive cover assembly (refer to 420).
 4. Insert a strip of clean paper between the heads to prevent the head surfaces from touching.
 5. Power on.
 6. Install a jumper **A** to activate the head load solenoid.
 7. Verify a 0.4 ± 0.13 mm (0.015 ± 0.005 inch) gap **C** between the bail and the carriage arm for all of the carriage movement (cylinder 00 to cylinder 76).



8. Is the gap OK?
Y N
- Go to 530, step 7.
9. Remove the jumper **A**.
10. Remove the paper from between the heads.
11. Reinstall the diskette drive cover assembly (refer to 430).
12. With the head load solenoid deactivated and the cover closed, visually check for a gap **B** of approximately 2.4 to 3.2 mm ($3/32$ to $4/32$ inch) of an inch between the head surfaces. (This gap cannot be measured).
13. Is the gap OK?
Y N
- Go to 530, step 14.
14. Power off.
15. Connect the drive motor power cable.
16. Power on.



540 Solenoid and Bail Removal (All Versions)

1. Power off
2. Disconnect the drive motor power cable.
3. Remove the diskette drive cover assembly (refer to 420).
4. Insert a strip of clean paper between the heads to prevent the head surfaces from touching.
5. Remove the bail return spring **E**
6. Remove the mounting screw **D** and the bail **C** (This pulls the solenoid plunger out of the solenoid. Be careful not to damage the plated surface of the plunger).

Early Version

- 7.1 Remove safety cover **H**
- 7.2 Remove the solenoid leads **G** from the taper pin terminal block **F** (Remember the cable path for the replacement procedure).

Danger
The 28 ohm resistor becomes very hot during normal usage.

Late Version

- 7.1 Disconnect the diskette drive control cable from position A2 **L**
- 7.2 Remove the two screws **K** and the connector covers.
- 7.3 Remove the two solenoid Leads **M** by pushing down on the tabs with a small screwdriver.
8. Remove the plunger from the bail.
9. Loosen the solenoid locking screw **A**
10. Remove the head load solenoid by turning it counterclockwise.

550 Solenoid and Bail Replacement (All Versions)

1. Install the solenoid about four turns clockwise into the casting.
2. Install the plunger to the bail. (Be careful not to damage the plated surface at the plunger).
3. While inserting the plunger into the solenoid; reinstall the bail **C** and the mounting screw **D**. Ensure that the bail is under the tab **B** of the carriage arm.
4. Reinstall the bail return spring **E**

Early Version

- 5.1 Carefully place and connect the solenoid leads **G** to the taper pin terminal block **F**

Note: The 28 ohm resistor must not touch any other components.

- 5.2 Replace safety cover **H**

Danger

Voltage is still present at the socket when the power cable is disconnected.

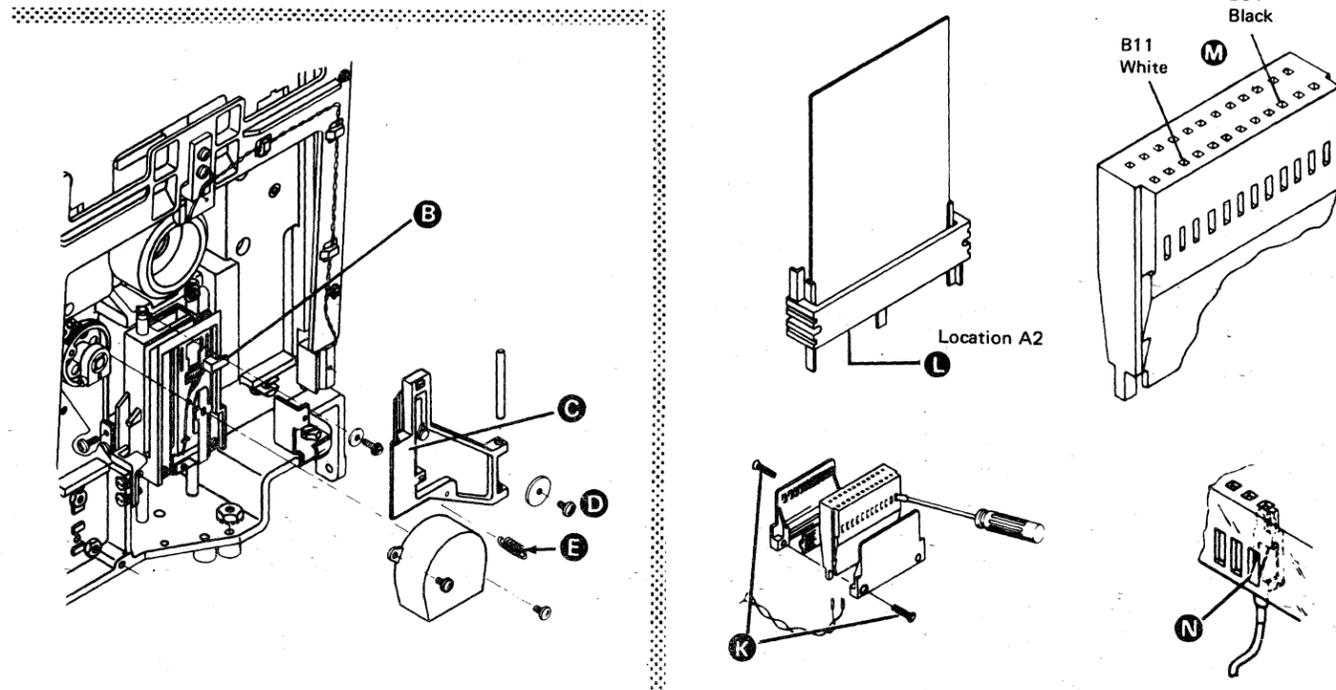
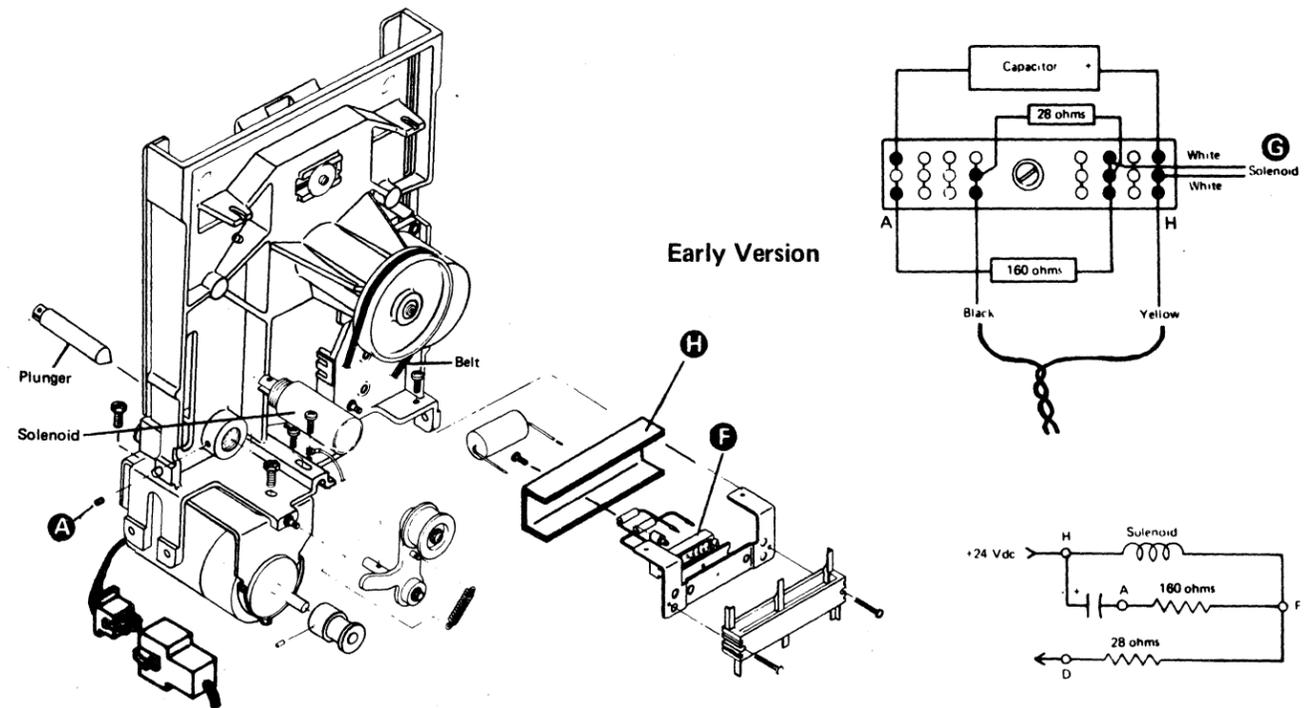
Late Version

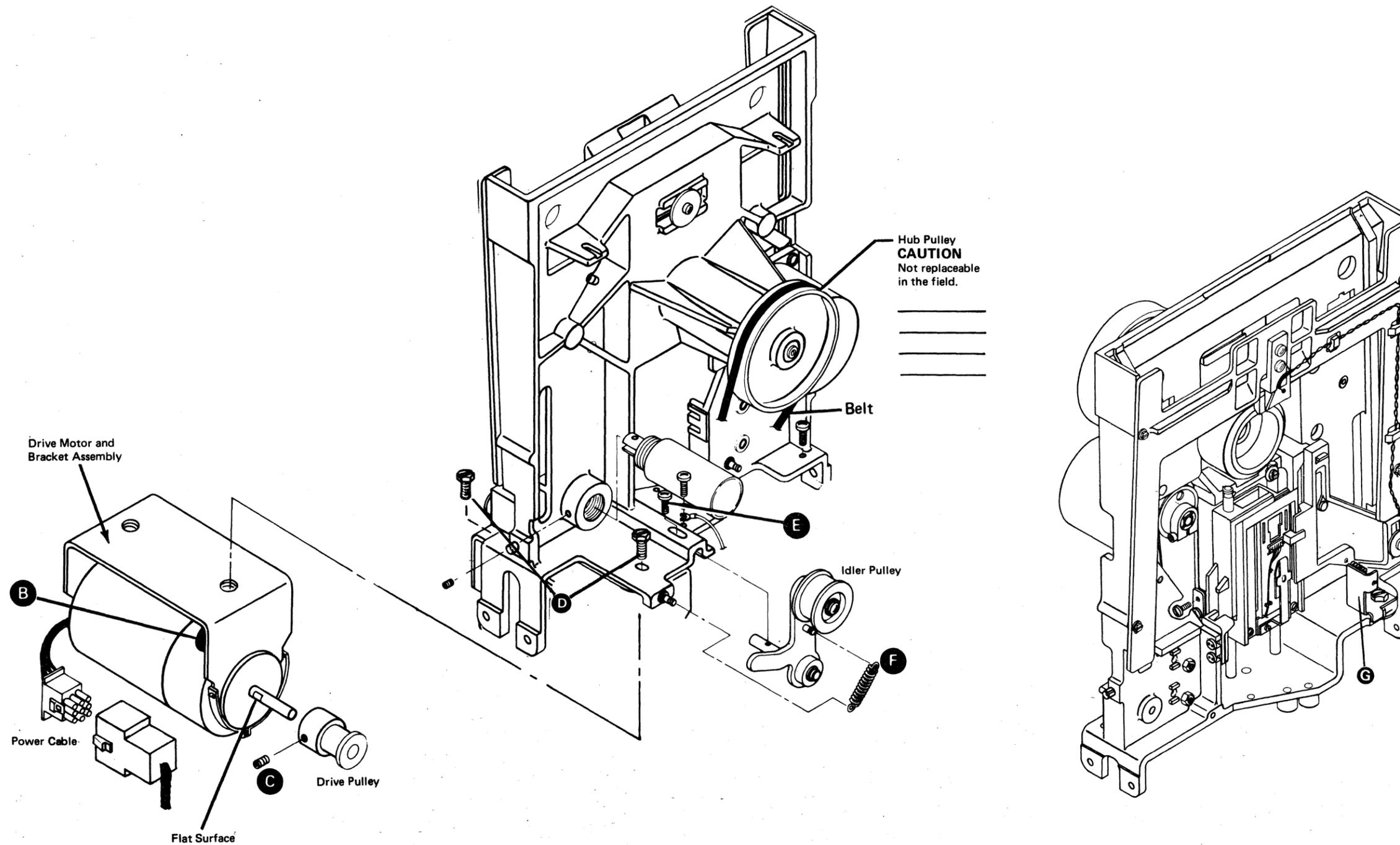
- 5.1 Insert the two solenoid Leads **M** into the diskette drive control cable connector. Ensure that the locking tabs **N** on the terminals lock in the connector slots.
- 5.2 Replace the cable connector covers and the two screws **K**
- 5.3 Plug the cable into position A2 **L** on the diskette drive control card socket.

Danger

Voltage is still present at the socket when the power cable is disconnected.

6. Power on.
7. Go to 530, step 6.





710 Pulley and Clamp Replacement

1. Reinstall the pulley, the clamp, and the clamp screw **E**. (Keep the screw loose so that the motor shaft can turn inside the pulley.)
2. Carefully reinstall the drive band ends on the pulley pin as shown **D**. Then reinstall the band clamp (with the notch facing away from the stepper motor) and the screw **C**. (Do not tighten the screw.)
3. Loosen the two idler mounting screws **G** and let the spring tension position the idler.
4. Tighten the mounting screws. (Center the drive band on the idler pulley as shown **H**.)
5. Reinstall the diskette drive control card and the card retainers.
6. Reinstall the head cable on the diskette drive control card.
7. Turn the stepper motor pulley by hand to cylinder 40 and insert a timing pin **F**. Two timing pins are located in the cover assembly (refer to 030).
8. Disconnect the drive motor power cable.

DANGER

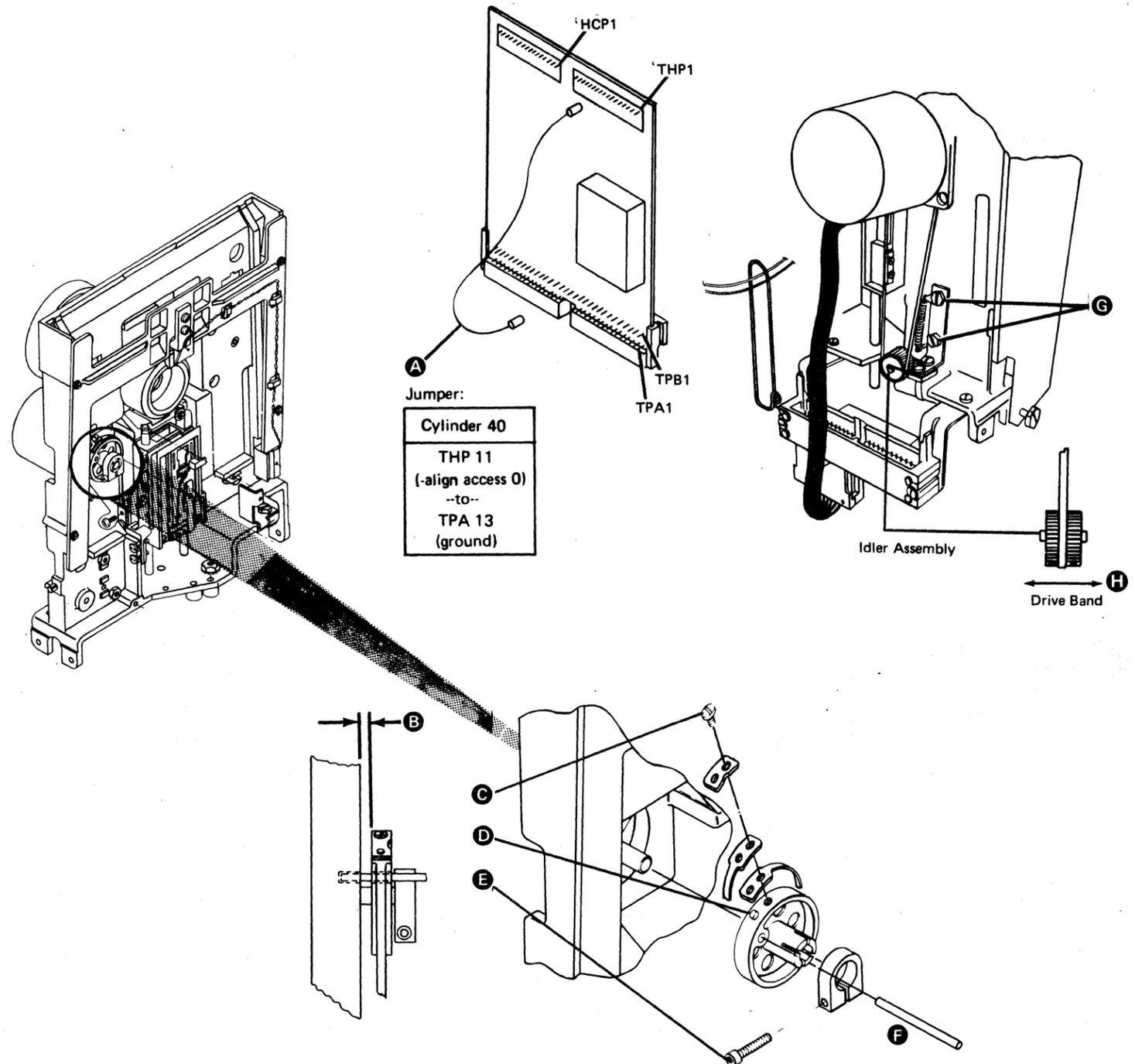
Voltage is still present at the socket when the power cable is disconnected.

9. Power on.

WARNING

To do the following procedure correctly, make sure the access lines are not active and can not be activated by an external source.

10. Install a jumper **A** from TPA13 (ground) to THP11 (-align access 0).
11. Make the gap **B** between the pulley and the casting the same as the gap that was recorded in 700 step 9.
12. Tighten the clamp screw **E**.
13. Remove the timing pin **F**.
14. Remove the jumper **A**.
15. Tighten the band clamp screw **C**. (Ensure that the drive band is straight.)
16. Power off.
17. Turn the stepper motor pulley by hand between cylinders 00 and 76. The drive band should track without movement to the left or right on pulley **H**.
18. Is the drive band centered?
Y N
— Go to 740, step 4.
19. Go to 480, step 4.



750 Drive Band Removal

1. Power off.
2. Remove the diskette drive cover assembly (refer to 420).
3. Remove the wiper assembly **E**.
4. Disconnect the head cable from the diskette drive control card.
5. Remove the card retainers and the diskette drive control card.
6. Loosen the two idler mounting screws **C**. Push the idler assembly **D** against the spring tension and tighten the mounting screws.
7. Place the head/carriage assembly to about cylinder 40.
8. Remove the two band clamp screws **A** and the clamp. Then place the head/carriage assembly at the lower limit (cylinder 00).
9. Remove the clamp screw **E** and the clamp.
10. Remove the drive band ends from the pulley pin. Then remove the band.

760 Drive Band Replacement

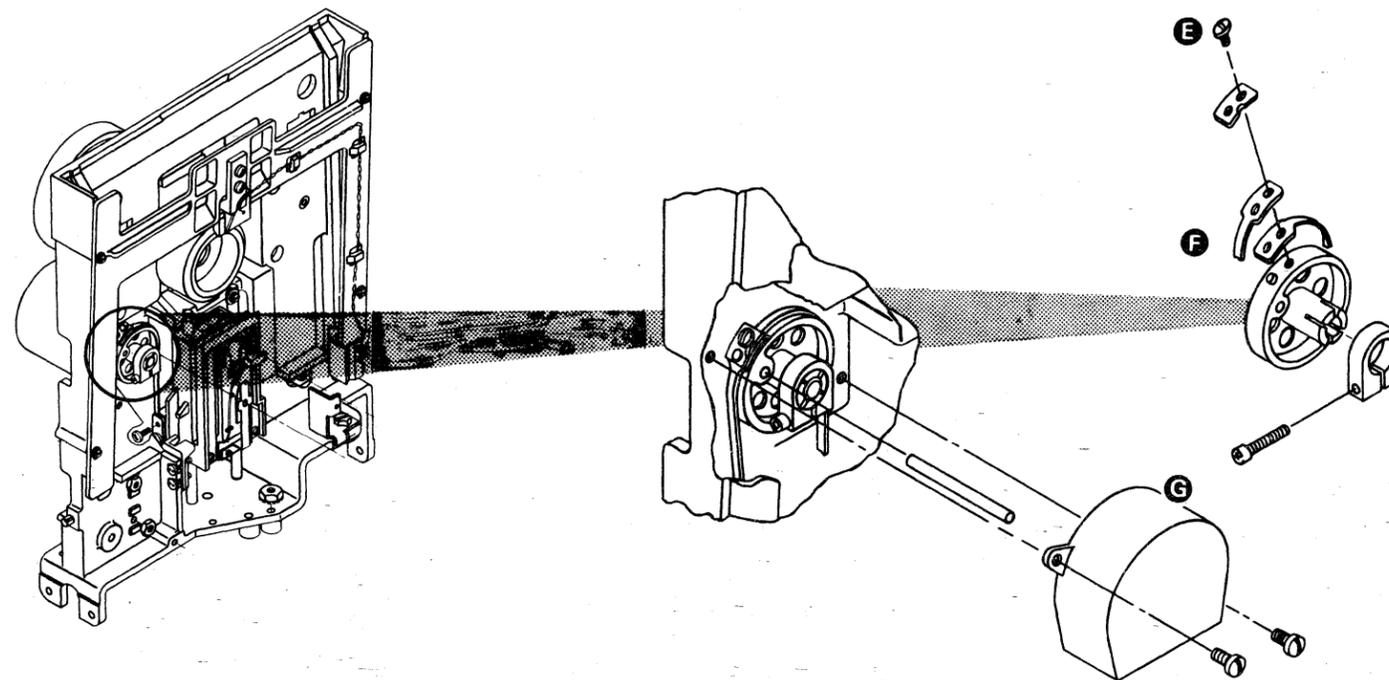
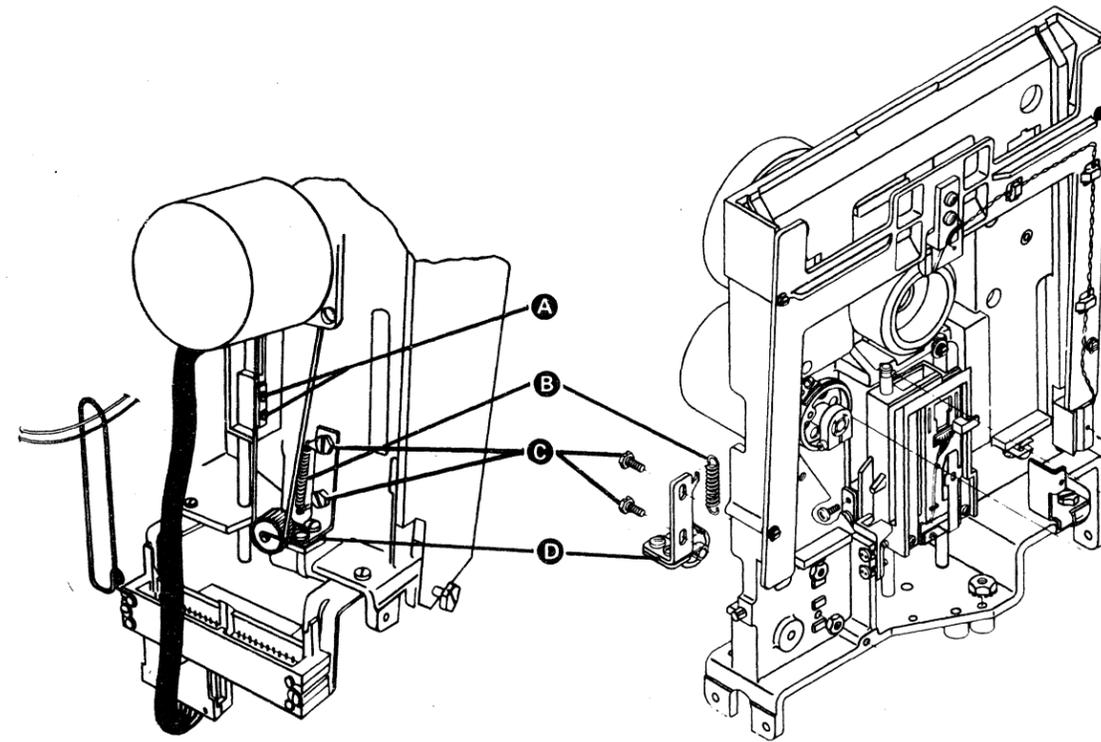
1. Place the drive band around the idler assembly.
2. Install the drive band ends on the pulley pin as shown **F**.
3. Reinstall the band clamp (with the notch facing away from the stepper motor) and the clamp screw **E**. (Ensure that the drive band is straight.)
4. Go to 740, step 8.

770 Idler Assembly Removal

1. Remove the drive band (refer to 750).
2. Loosen the two mounting screws **C**.
3. Remove the idler spring **B**.
4. Remove the mounting screws and the idler assembly **D**.

780 Idler Assembly Replacement

1. Reinstall the idler assembly **D** and the two mounting screws **C**. (Do not tighten the screws.)
2. Reinstall the idler spring **B**.
3. Push the idler assembly against the spring tension. Then tighten the mounting screws.
4. Go to 760.



810 LED Output Service Check

1. Connect the negative probe of a multimeter to the ground test pin **C** on the diskette drive control card.
2. Set the multimeter scale to 5 Vdc and connect the positive probe to the 43FD LED voltage test pin **A**.
3. Check for a voltage level of 1 Vdc to 2 Vdc.
4. Move the positive probe to the 33FD LED voltage test pin **B**.
5. Check for a voltage level of 1 Vdc to 2 Vdc.

KEY	SIGNAL	PIN
A	43FD LED VOLTAGE	TPB14
B	33FD LED VOLTAGE	TPA12
C	GROUND	TPA6

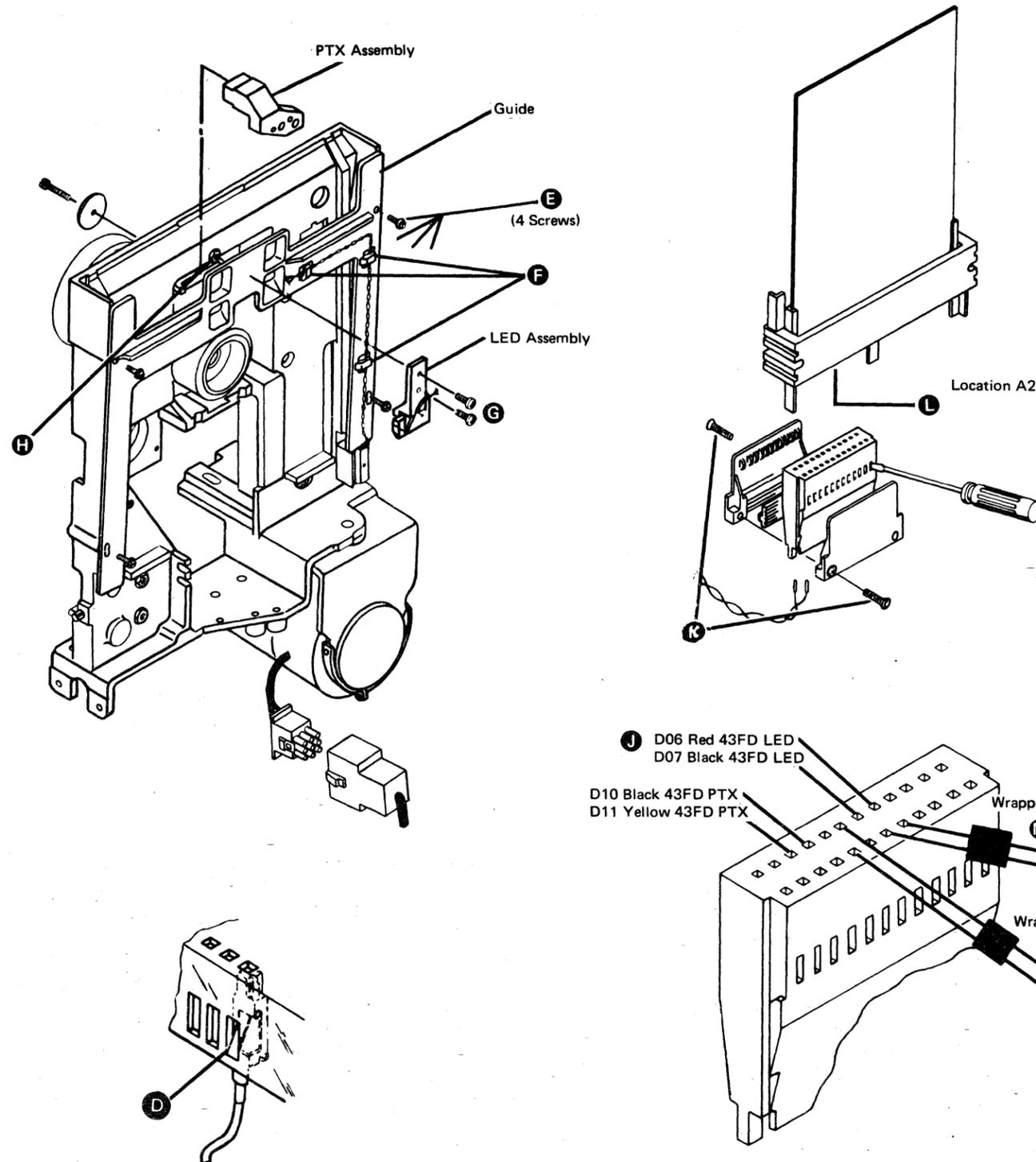
Note: See paragraph 890 for test pin locations

820 LED Removal

1. Power off.
2. Remove the diskette drive cover assembly (refer to 420).
3. Disconnect the diskette drive control cable from location A2 **L**.
4. Remove the two screws **K** and the connector covers.
5. Remove the two 33FD LED leads **M** and the two 43FD LED leads **J** by pushing down on the tabs with a small screwdriver.
6. Remove the LED cable from the three retainers **F**. (Remember the cable path for the replacement procedure.)
7. Remove the four guide mounting screws **E** and the guide.
8. Remove the two LED mounting screws **G** and the nuts **H**. Then remove the LED assembly.

830 LED Replacement

1. Install the LED assembly, the two mounting screws **G**, and the nuts **H** onto the guide. (Do not tighten.)
2. Replace the guide and the four mounting screws **E**.
3. Follow the cable path through three retainers **F** and insert two 33FD LED leads (the wrapped pair of leads) **M** and two 43FD leads **J** into the diskette drive control cable connector. Ensure that the locking tabs **D** on the terminals lock in the connector slots.
4. Reinstall the cable connector covers and the two screws **K**.
5. Plug the cable into location A2 **L** on the diskette drive control card socket.
6. Go to 800, step 6.



850 PTX Removal

1. Power off.
2. Remove the diskette drive cover assembly (refer to 420).

CAUTION

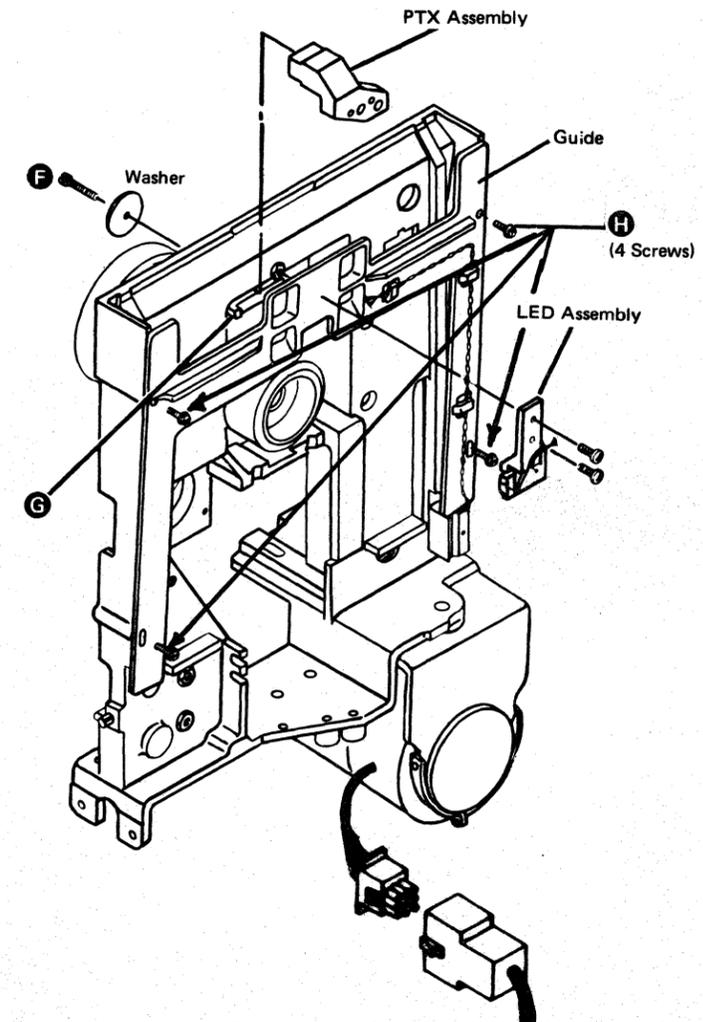
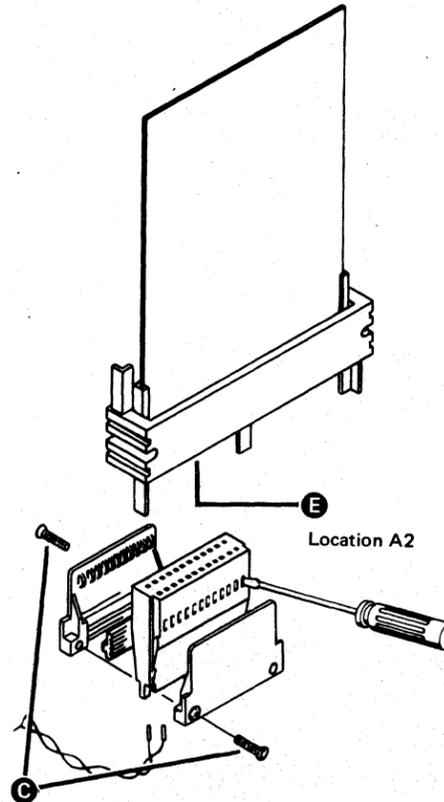
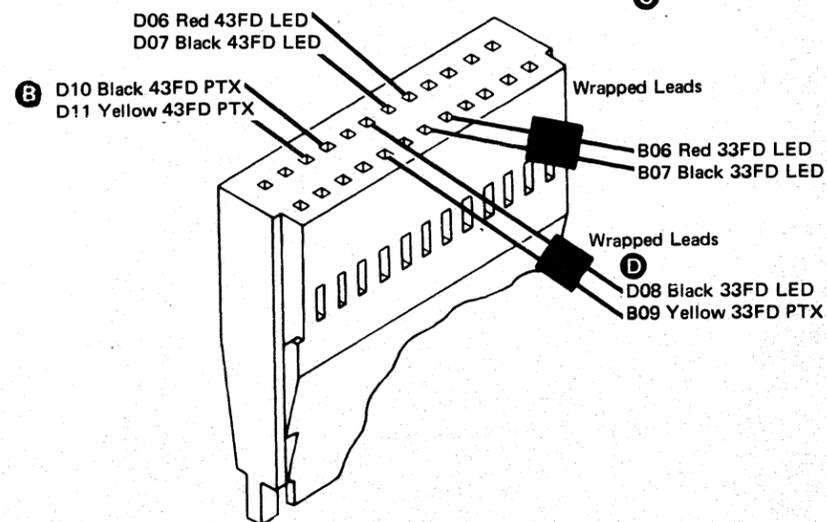
While performing the following steps, be careful not to damage the LED leads.

3. Remove the four guide mounting screws **H** and the guide.
4. Disconnect the diskette drive control cable from location A2 **E**.
5. Remove the two screws **C** and the two connector covers.
6. Remove the two 33FD PTX leads **D** and the two 43FD PTX leads **B** by pushing down on the tabs with a small screwdriver.
7. Remove the PTX mounting screw **F** and the washer.
8. Remove the PTX assembly. (Remember the cable path for the replacement procedure.)



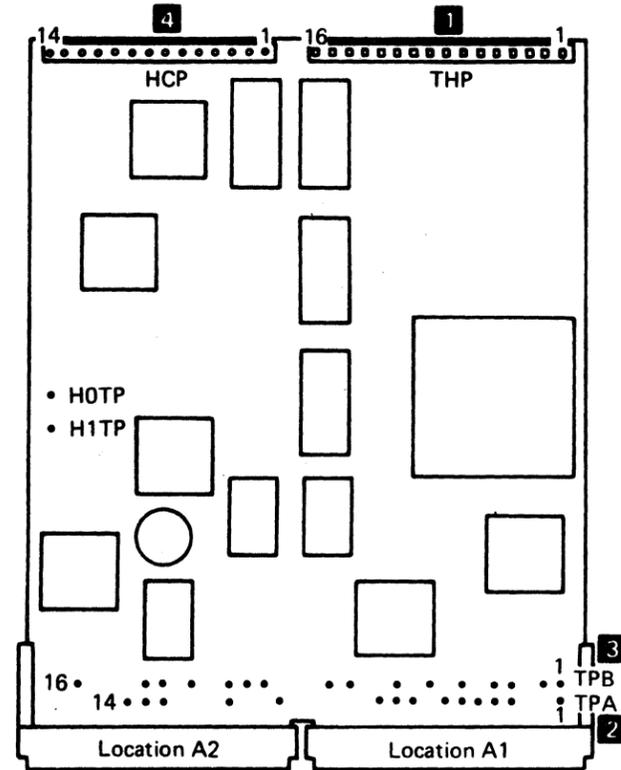
860 PTX Replacement

1. Install the PTX assembly against the casting stop **G** (away from leads,) then reinstall the screw **F** and the washer.
2. Follow the cable path and insert the two 33FD PTX leads (the wrapped pair of leads) **D** and the two 43FD leads **B** into the diskette drive control cable connector. Ensure that the locking tabs **A** on the terminals lock in the connector slots.
3. Reinstall the connector covers and the two screws **C**.
4. Plug the connector into location A2 **E** of the diskette drive control card socket.
5. Reinstall the guide and the four mounting screws **H**.
6. Go to 800, step 5.



890 Control Card Test Pins (continued)

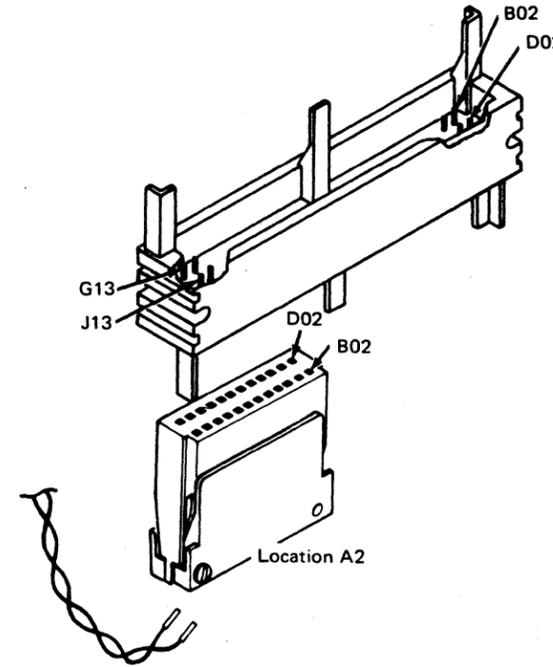
NEW card version P/N 4178065



TPB1	+Access 0
TPB2	+Access 1
TPB3	+Access 2
TPB4	+Access 3
TPB5	+File Data
TPB6	+Diskette Sense
TPB7	+Head Engage
TPB8	+Switch Filter
TPB9	+Index
TPB10	MC-3
TPB11	MC-0
TPB12	MC-2
TPB13	-Head Load
TPB14	43FD LED Voltage
TPB15	+5 Vdc
TPB16	43FD PTX

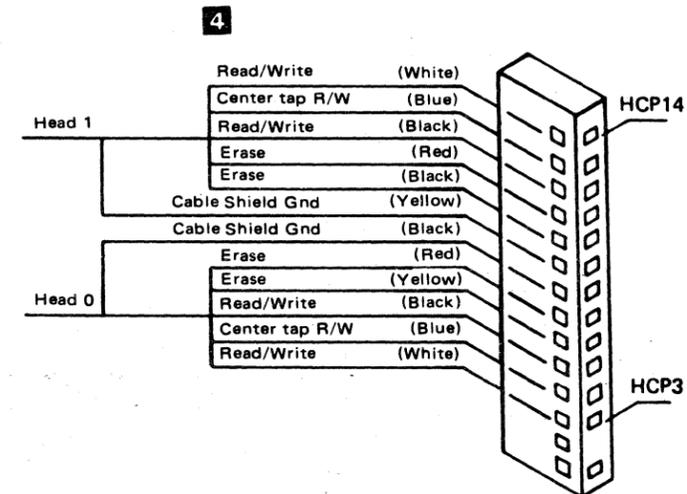
4 For details refer to '910 Control Card Head Cable Pins'.

900 Control Card Socket and Connector Pins



910 Control Card Head Cable Pins

THP1	+Diskette Loaded	TPA1	+Write Data
THP2	-Hd Ld Osc	TPA2	+Erase Gate
THP3	+14 Vdc	TPA3	+Write Gate
THP4	Ground	TPA4	+Inner Tracks
THP5	Ground	TPA5	+Select Head 1
THP6	+43FD Index	TPA6	Ground
THP7	+33FD Index	TPA7	+current Enabled
THP8	Diff Read A	TPA8	+24 Vdc
THP9	Diff Read B	TPA9	-5 Vdc
THP10	-High Gain	TPA10	MC-1
THP11	-Align Access 0	TPA11	+Hd Load Solenoid
THP12	-High Current	TPA12	33FD LED Voltage
THP13	Preamp TP1	TPA13	Ground
THP14	Preamp TP2	TPA14	33FD PTX
THP15	-High Gain A		
THP16	-High Gain B		



920 Control Card Interface
Description (continued)

+Select Head 1: When active, this line selects head 1. (Refer to 170.)

+Head Engage: When active, this line loads the read/write heads.

+Index: This line indicates the beginning of a track. This 1.5 to 3.0 ms pulse occurs every 166.7 ms.

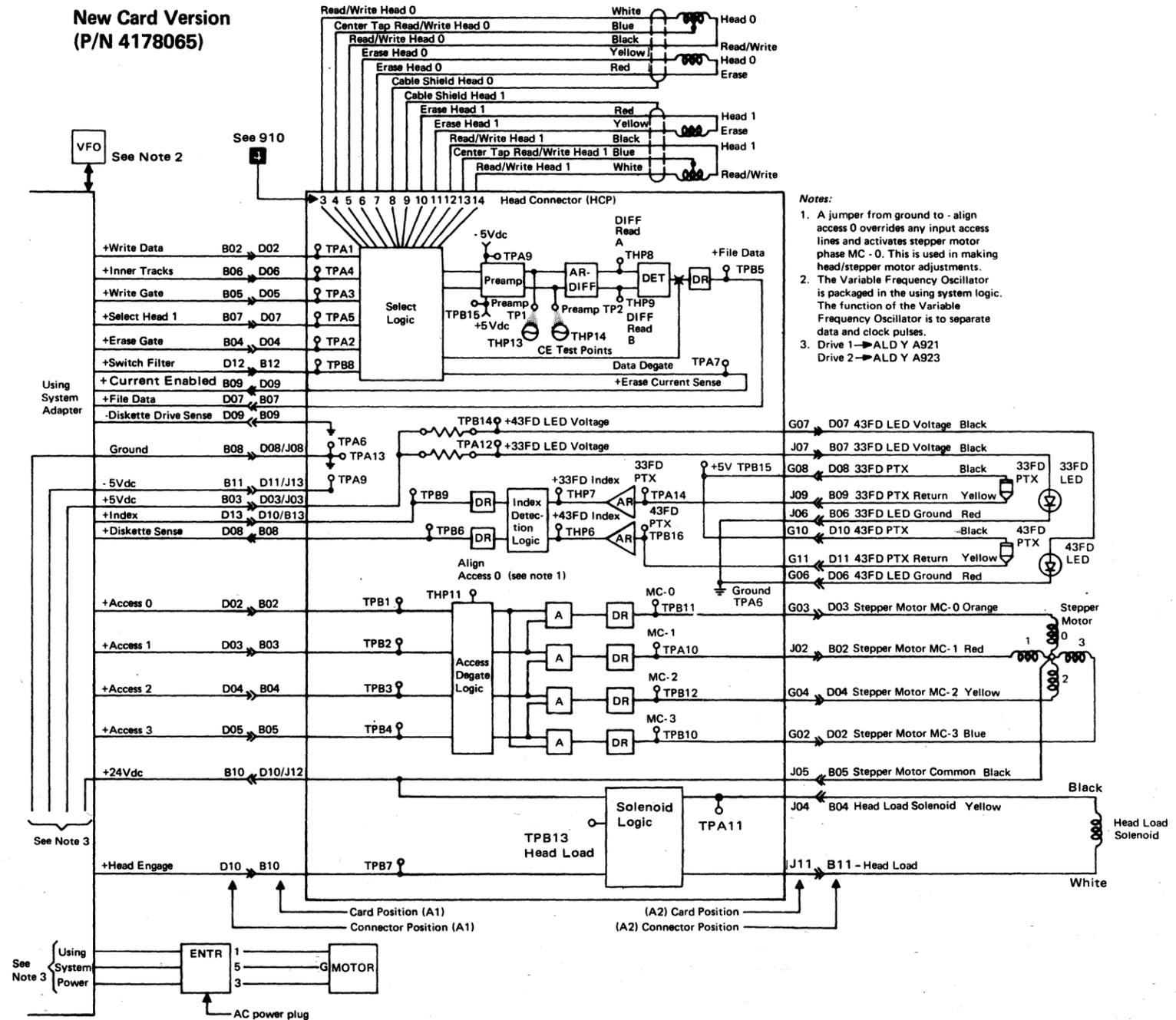
+File Data: File data is a series of clock and data pulses that represent the data read from the diskette surface.

+Diskette Sense: When active, this line indicates that a diskette 2 or 2D is being used. This line is not activated by a diskette 1.

-Diskette Drive Sense: This line is normally minus indicating that the diskette drive installed uses type 2 or 2D diskettes.

+Inner Tracks: On a write operation, this line is used to reduce the amount of recording current beyond the middle cylinders. On a read operation, this line is used to compensate for bit shifting beyond the middle cylinders.

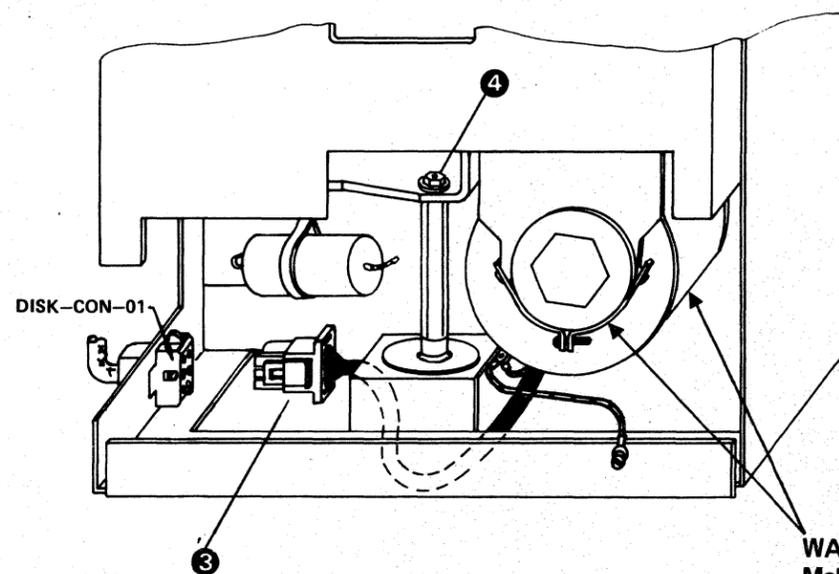
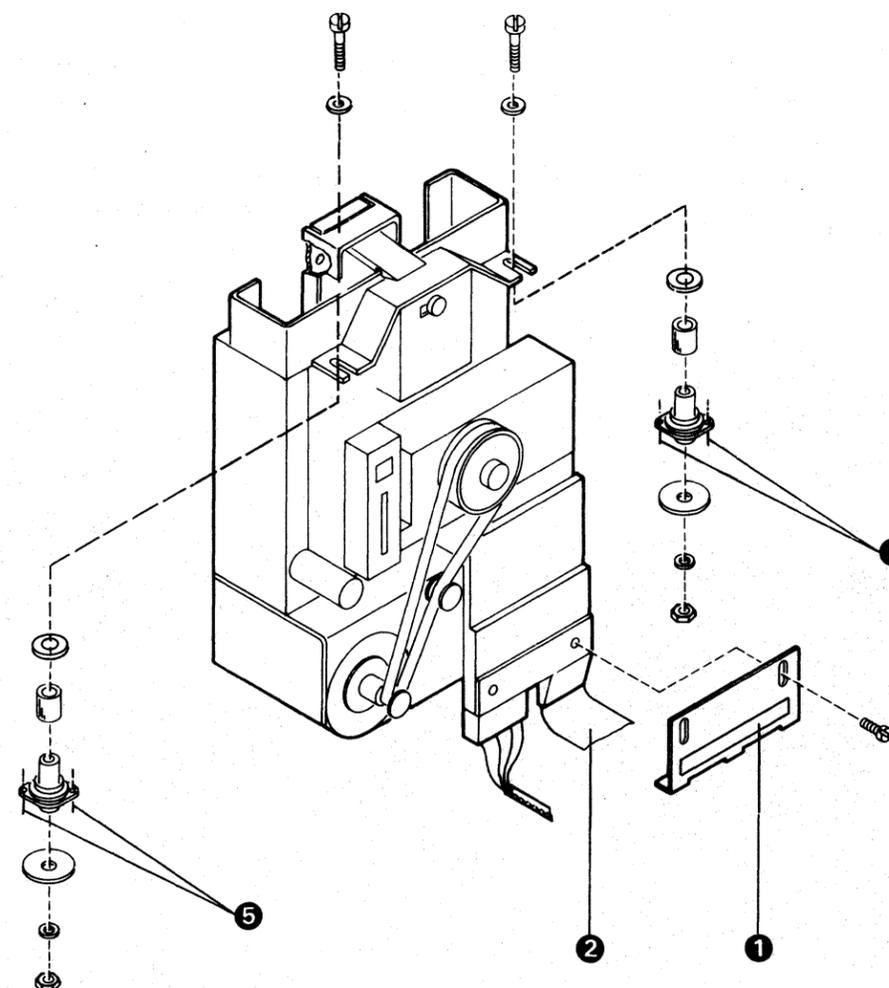
+Switch Filter: This line is used with the inner tracks line to further compensate for bit shifting beyond cylinder 60 for MFM encoding. This line is not used on a write operation.



940 CDF Removal and Replacement

If you are told by the MAP to replace the complete disk drive unit perform the following steps:

1. Turn power off.
2. Remove diskette from drive to be replaced.
3. Remove connector retainer. ①
4. Disconnect DC cable (position A1) from the diskette drive control card. ②
5. Disconnect AC cable: ③
6. Unscrew and remove nut and washer of lower mounting pin. ④
7. Loosen the four screws holding the upper two shock mounts. ⑤
8. Hold the drive unit and remove the four screws. Remove the whole unit together with the two upper shock mounts.
9. Install new drive unit. Perform the above steps in the reverse order.



WARNING:
Make sure that the motor holding clamps do not touch the motor housing.

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STM

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I/O Diskette Drive Tests

Test Handling - Actions

Prerequisites

- Power complete
- IML complete
- Diagnostic diskette inserted in system drive
- Diskette to be tested inserted in I/O device

Caution: Some devices (for example 3741) are capable to flag up to two defective cylinders during initialization and assign alternative cylinders.

The I/O diskette drive tests do not support testing with diskettes which do have alternative tracks assigned. The tests with selection 2, 3, 6, 7, and 8 will fail. See 'How to Check for Allocated Cylinders' under test selection 7.

How to Select the Tests

1. Call M/S Program Selection. **A**
2. Key in selection for 'CENTRAL COMPLEX', press ENTER. **B**
3. Select I/O Diskette Drive Maintenance Program. **C**
4. Key in the appropriate test selection.

Handling of Tests (Selection 1 to 8)

After entering the selection ID (1-9) press ENTER to start the test. The selection menu display will not change for selection 1 to 5 but additional information is displayed. **D**

To stop a running test, except test 8, press ENTER again. By pressing ENTER a third time a stopped test can be continued or restarted and so on.

To return to the test selection menu type in an 'R' and press ENTER, select new test.

How to Terminate the Test

If you want to run any test other than a diskette drive test return to M/S PROGRAM SELECTION. Select new test, otherwise perform the following steps:

1. Press ENTER to stop the test
2. Insert control diskette
3. Perform re-IML
4. Return machine

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Test Handling - Results

Screen Displays

- A** 'IBM MAINTENANCE AND SERVICE PROGRAM SELECTION'
B 'CENTRAL COMPLEX TEST SELECTION'

C

```

I/O DISKETTE DRIVE MAINTENANCE PROGRAM

1 = ADAPTER TEST          2 = ACCESS TEST
3 = READ TEST             4 = WRITE TEST
5 = LOOP FUNCTION         6 = MANUAL SELECTION
7 = RECORD DISPLAY        8 = DISKETTE SURFACE
9 = COPY AND FORMATTING

SELECTION:

DATA:          ADDR:

ANSWER
    
```

D

```

I/O DISKETTE DRIVE MAINTENANCE PROGRAM |
                                         | 1 DISK TYPE
1 = ADAPTER TEST          2 = ACCESS TEST
3 = READ TEST4           4 = WRITE TEST
5 = LOOP FUNCTION         6 = MANUAL SECTION
7 = RECORD DISPLAY        8 = DISKETTE SURFACE
9 = COPY AND FORMATTING

END OF TEST

SELECTION:

TIMER: OFF      DATA:          ADDR:

STOPPED        <--(B)

                <--(C)
    
```

(A) For selection 2 to 5 and 6 the disk type used is displayed here.

Diskette 1: One-sided diskette with 128, 256, or 512 bytes per record.

Diskette 2: Two-sided diskette with 256 bytes per record.

Diskette 2D: Two-sided, double density diskette with 256, 512 or 1024 per record.

(B) This field displays the name of the test currently executed, or a message indicating how to continue.

(C) Status field

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I/O Diskette Drive Tests (continued)

Test Handling - Actions

Test Selection 6 (continued)

For the head parameter any decimal number from one and higher is accepted as head one selection.

The ACCESS and READ routines we are running in a continuous loop. The loop can be stopped and/or started by pressing the ENTER key.

By stopping the test and entering an 'S' behind SELECTION the cursor moves to the parameter field thus allowing to alter the parameters. Press ENTER to continue the test with new parameters. To switch from ACCESS to READ or vice versa return to Main Selection Menu by entering 'R' behind SELECTION.

Test Selection 7

By entering a 7 as selection, the 'record display' picture is selected.

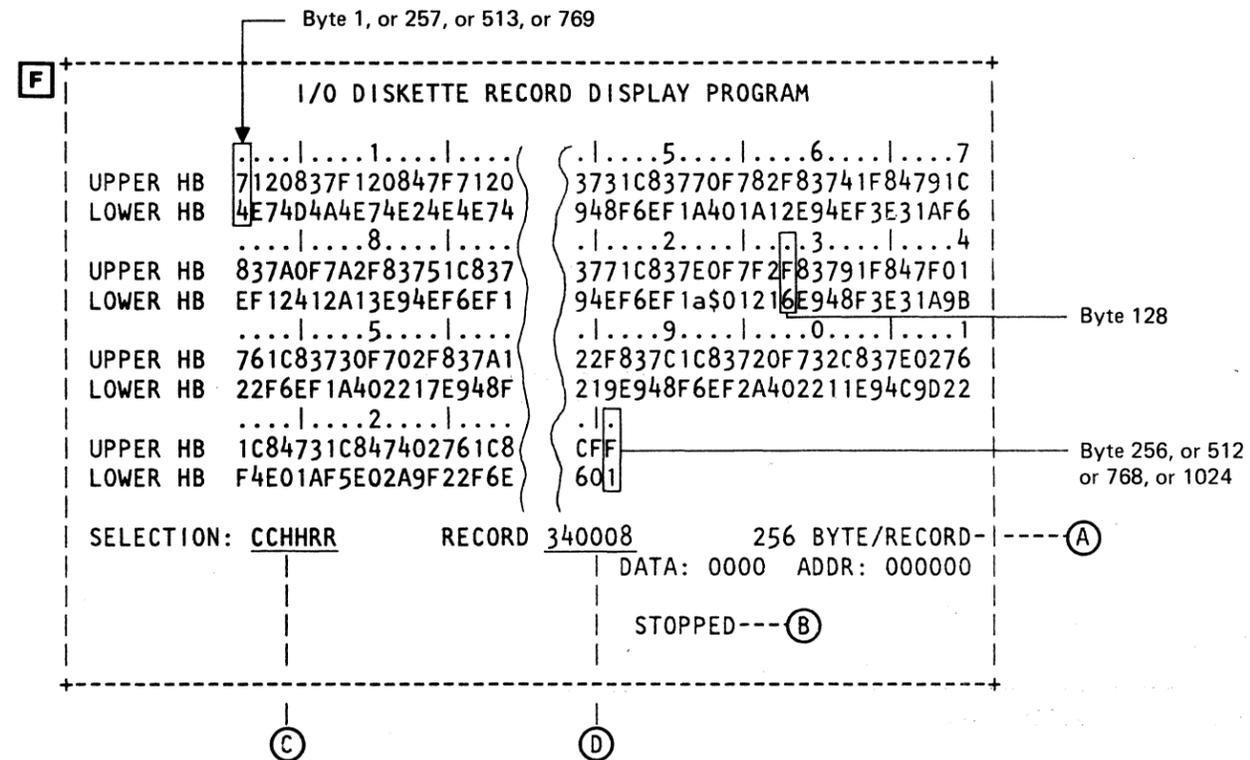
Enter the record number in the format 'cylinder-head-record' in decimal notation, press 'ENTER'. This causes the selected record to be displayed **F**.

Up to 256 bytes can be displayed in a frame. If a 512 or 1024 byte record has to be displayed the display consists of two or four frames. When the first frame is displayed and the record exceeds 256 bytes the word 'AGAIN' is displayed behind 'Selection', press 'ENTER' to display next frame of record.

How to Check for Allocated Cylinders

Display record 5 enter for CCHRR = 000005 to check for defective (allocated) cylinders. Check data bytes 7, 8, and 9 for X'404040'. If value differs, alternate tracks are assigned.

Test Handling - Results



(A) Message field, giving the size of the record for example:

256 BYTES/RECORD

on information how to proceed.

ENTER TO GO TO SELECTION

This means press ENTER to return to the main selection picture. In this case the displayed record information is lost.

(B) Status field, the message STOPPED, RUNNING, INVALID, or ERROR can appear. In addition to 'ERROR' a reference code is shown.

(C) Enter field for the record to be displayed.

(D) This field shows the number of the displayed record.

I/O Diskette Drive Tests (continued)

Test Handling - Actions

Purpose

This program is only intended to produce copies of control and/or diagnostic diskettes. These diskettes are two D-type diskettes with a 256 bytes/record format. Therefore the

- Diskette to be formatted must be a 2D-type diskette.
- Diskette is formatted for 256 bytes record.
- If other type diskettes are mounted unpredictable errors may occur.

Test Selection 9

By typing in a '9' the 'I/O Diskette Drive Copy and Formatting Program' is invoked. **H**

This program offers two subselections:

- 1 = Formatting and Copy Diskette Routine
- 2 = Copy only Diskette Routine

- The routine is about fifteen minutes for subselection one and seven minutes for subselection two. These programs cannot be stopped during execution.

Subselection 1

This subselection calls a program routine which in its first phase will format a diskette before the contents of another diskette is written (copied) one to one onto this new formatted one.

The messages displayed inform you which cylinder is just processed or, when the execution of a program step is finished, which action has to be taken to continue.

Subselection 2

The program called by this subselection allows you only to execute the copy function. Messages are displayed in the same way as for subselection 1.

Test Handling - Results

```

H I/O DISKETTE DRIVE COPY AND FORMATTING PROGRAM

      1 = FORMATTING AND COPY DISKETTE ROUTINE
      2 = COPY ONLY DISKETTE ROUTINE

SELECTION:                                DATA:                                ADDR:
                                         ANSWER
  
```

Subselection 1 = Example for Message Display:

The first screen display for subselection one tells you

I/O DISKETTE FORMATTING ACTIVE

and asks you to

INSTALL DISKETTE TO I/O DRIVE.

ANSWER

Insert diskette to be formatted and written during the copy operation, press ENTER in reply to ANSWER.

The screen now tells you

I/O DISKETTE FORMATTING ACTIVE

CYLINDER-NUMBER 00 } Running
76 }

The program stops with

CYLINDER-NUMBER 00

FORMATTING END
ANSWER

Press ENTER in reply to ANSWER. This calls the next display message.

I/O DISKETTE COPY PROGRAM ACTIVE
INSTALL DISKETTE TO SYS DRIVE

ANSWER

The diskette just formatted remains in the I/O drive. During the copy program cycle which follows next, the diskette in the system drive is read and the information is written onto the diskette in the I/O drive. Insert the diskette to be copied into the system drive, press ENTER.

I/O DISKETTE COPY ACTIVE
CYLINDER-NUMBER 00 } Running
76 }

The program stops with

END OF COPY DISKETTE
ANSWER

If the diskette in the system drive is not the RAS diskette, reinsert the RAS diskette, then press ENTER to return to the 'M/S Program Selection' picture.

System Diskette Drive Test (53FD Diagnostics)

Tests Available

There are no tests available to check functions such as read, write, or seek. These functions are tested automatically during IML. The only function selectable for the system drive (only available if no I/O drive is installed) is the Diskette Surface Analysis test. This test allows the CE to check diskettes for defective tracks.

```

+-----+
| Test Handling - Actions |
+-----+
    
```

Prerequisites

- Power complete
- IML complete
- Diagnostic diskette inserted

How to Select the Test

1. Call M/S PROGRAM SELECTION **A**
2. Key in selection for CENTRAL COMPLEX, press ENTER. **B**
3. Select 53FD diagnostic test, press ENTER. **C** This selection will in this case (only system drive installed) directly display the DISKETTE SURFACE ANALYSIS screen picture. Follow the instructions given in the display. During the test execution the number of the currently tested track is displayed. At test end picture **D** is displayed. Error information varies depending of the test result.

Function

This test checks the diskette for defective tracks. Data of the first detected error on a track is displayed. Up to eight per line or a total of 32 errors can be displayed.

Example for error display: **C**

First error				Second error			
14	01	18	40	16	00	19	20
V	V	V	+>>	Error code			
CC	HH	RR		40 = CRC check			
				30 = Record not found			
				20 = Underrun/overrun			

CC = Cylinder
HH = Head
RR = Record

Note that this program when started can not be stopped except by pressing MOD SEL key which causes a return to the M/S PROGRAM SELECTION picture.

```

+-----+
| Test Handling - Results |
+-----+
    
```

Screen displays:

A IBM MAINTENANCE AND SERVICE PROGRAM SELECTION

B CENTRAL COMPLEX TEST SELECTION

C

```

+-----+
|          DISKETTE SURFACE ANALYSIS          |
|.....|
|.....INSTALL DISKETTE TO BE TESTED TO DRIVE.....|
|.....PRESS ENTER TO START OPERATION.....|
|          NUMBER OF DEFECTIVE TRACKS          |
|SELECTION:          TIMER:OFF          DATA:          ADDR:|
|                                     STOPPED|
+-----+
    
```

D

```

+-----+
|          DISKETTE SURFACE ANALYSIS          |
|C--->140118.40.160019.20.....|
|.....|
|.....|
|          NUMBER OF DEFECTIVE TRACKS 0002 <---B|
|SELECTION:          TIMER:OFF          DATA:          ADDR:|
|                                     STOPPED|
+-----+
    
```

A Four lines for error display. Up to eight errors can be displayed per line.

B Total count of all tracks in error. This count can exceed the count of displayable errors which is 32.

Supplement to MAPS, Section 6: Configure Procedures

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Alter Channel Number	6112
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SYSTEM CHART

CHANNEL ASSIGNMENTS

ASSIGNMENTS FOR 4331 MODEL 2		
CHANNEL NUMBER	ASSIGNED ADAPTER	REMARKS
0	MPX/CA/BBA	MUST BE CHANNEL 0
1	BMPX 1	
2	FTA 1	
3	FTA 2	EXCLUSIVE WITH BMPX 2 OR HSC
4	BMPX 2	EXCLUSIVE WITH FTA 2
5	FTA 3	EXCLUSIVE WITH HSC
6	HSC	EXCLUSIVE WITH FTA 2 OR FTA 3 INSTALLED

ASSIGNMENTS FOR 4331 MODEL 11		
CHANNEL NUMBER	ASSIGNED ADAPTER	REMARKS
0	MPX/CA/BBA	MUST BE CHANNEL 0
1	BMPX	
2	FTA 1	
3	FTA 2	

Note: Channel numbers are usually assigned as shown in the charts. However, addresses 1 through 6 may be assigned to any channel except MPX by using the alter channel configure screen. See 'STM 6112'.

TIME-OF-DAY (TOD) CORRECTION IS E/W ____ HRS

BBAO (DCA) IS CHANNEL 0				MPX IS CHANNEL 0				CA IS CHANNEL 0			LOOP ADAPTER					
PORT	DEV	TYPE	ADDR T	PORT	DEV	TYPE	ADDR T	DEV	TYPE	ADDRESS	INST	ADDR	LINE	TYPE		
00	_____	_____	_____	08	_____	_____	_____	_____	_____	_____	Y / N	30	_____	_____	LOOP PRECONFIGURED BY MANUFACTURING TO TEST MACHINE AT INSTALLATION. ACTUAL CONFIGURING OF LOOP IS THE CUSTOMER'S RESPONSIBILITY.	
01	_____	_____	_____	09	_____	_____	_____	_____	_____	_____	Y / N	31	_____	_____		
02	_____	_____	_____	10	_____	_____	_____	_____	_____	_____	Y / N	32	_____	_____		
03	_____	_____	_____	11	_____	_____	_____	_____	_____	_____	Y / N	33	_____	_____		
04	_____	_____	_____	12	_____	_____	_____	_____	_____	_____	Y / N	34	_____	_____		
05	_____	_____	_____	13	_____	_____	_____	_____	_____	_____	Y / N	35	_____	_____		
06	_____	_____	_____	14	_____	_____	_____	_____	_____	_____	Y / N	36	_____	_____		
07	_____	_____	_____	15	_____	_____	_____	_____	_____	_____	Y / N	37	_____	_____		
CUST DISKETTE IS CHANNEL 0				MFCU IS CHANNEL 0				CHANNEL SUMMARY:				SEE DETAILED LINE DESCRIPTION, STM FEATURES, CA SECTION AND MAP 88FF.			SEE DETAILED INFORMATION IN STM VOL.15 SECTION 6 'CONFIGURATION'.	
INSTALLED		ADDRESS		INSTALLED		ADDRESS		FTA 1 IS CHANNEL _____		HSC IS CHANNEL _____						
Y N		_____		Y N		4C		FTA 2 IS CHANNEL _____		BMPX 1 IS CHANNEL _____						
								FTA 3 IS CHANNEL _____		BMPX 2 IS CHANNEL _____						

Diskette Configuration

The functional microcode can be on one or two diskettes. A 4331 can be shipped with one or two sets of functional microcode (control diskettes) and one diagnostic diskette. Therefore, you will receive either 1, 2, or 4 control diskettes and always one diagnostic diskette.

When you are ready to configure the first control diskette (FU1, Seq. 1), there may, or may not, be any addresses configured.

You must check/add/delete configuration data so that it agrees with the physical machine and the customer address assignments.

Operating the 4331 with incorrect configuration data can cause hard diagnose problems when customer applications are run on the system.

Start Manual Configuration of System Control Diskette

This procedure should be followed to do a complete manual configuration of the 4331 system. Each configuration step directs you to detailed information for that particular configuration action. When you have completed the action, return to the next step on this page.

Step 1. Check the 'System Chart.' STM - 6018 and 6019.

Record any missing information. The 'System Chart' will be used for steps 2 through 10.

Step 2. Set Time-of-Day correction. STM - 6110

Use information from the 'System Chart' to set TOD correction. This must be done so that TOD on the LOGS will match the TOD of the error.

Step 3. Alter Channel Number. STM - 6112

Use information from the 'System Chart' to check or alter channel number settings.

Step 4. Configure Native Displays and Printers. STM - 6124

Use information from the 'System Chart' to configure native devices.

Step 5. Assign Address to Customer Diskette. STM - 6126
(Skip if no customer diskette.)

Use information from the 'System Chart' to assign the customer diskette address.

Step 6. Configure FTA 1 or 3. STM - 6130 (Skip if FTA not installed.)

Use information from the 'System Chart' to configure FTA 1 or 3.

Step 7. Configure FTA 2. STM - 6135 (Skip if FTA 2 not installed.)

Use information from the 'System Chart' to configure FTA 2.

Step 8. Configure High Speed Channel. STM - 6143
(Skip if HSC not installed.)

Use information from the 'System Chart' to configure HSC.

Step 9. Configure Block Multiplexer Channel 1 or 2. STM - 6145
(Skip if BMPX(s) not installed.)

Use information from the 'System Chart' to configure BMPX.

Step 10. Configure CA. STM - 6160 (Skip if CA not installed.)
In addition to the 'System Chart' you will also need the detailed 'CA Line Descriptions' from the STM Features, and MAP 88FF. The line description charts are at end of the CA pages in the STM Features book.

Step 11. Loop Configuration. STM - 6165 (Skip if not installed.)
The loop adapter configuration is the responsibility of the customer. The loop is preconfigured to allow testing of the system.
Continue with next step.

By completing steps 1 through 11 you have written your exact configuration on one of the control diskettes. You must now copy this data to the other control diskette. The configuration data must also be copied to the diagnostic diskette to prevent invalid error stops during testing.

Step 12. Do the Copy Configure. STM - 6170

All of the system diskettes are now configured.

If you were directed to 'STM Section 6' by some other instructions (EC, MES, Installation Manual, etc.), return to those instructions.

Alter Channel Number

Configure Procedure

1. Display the Alter Channel Number screen:
 - a. ALT key with MOD SEL to get the Maintenance Selection screen.
 - b. Select Utilities/Remote.
 - c. Select Alter Channel Number.
2. If the displayed current channel numbers match the channel summary in the System Chart, go to step 6.
3. Make any needed changes to the Alter Channel Number line and hit ENTER. Error messages and probable causes are listed under the screen picture.

Display Example for 4321 and 4331 Model 1

ALTER CHANNEL NUMBER								
XXXXX IS INDICATED IF NO ADAPTER ATTACHED								
ADAPTER NUMBER	0	1	2	3	4	5	6	7
ADAPTER TYPE	XXXXX	MPX	FTA2	XXXXX	FTA1	BMPX	BBA0	XXXXX
ADAPTER TYPE		CA					BBA1	
CURRENT CHANNEL NUMBER	X	0	3	X	2	1	0	X
ALTER CHANNEL NUMBER:	.	0	.	.	.	.	0	.
16MB VSE TIMER: OFF DISK				DATA:		ADDR:		
TOD: SEC								
0700								

4. You must now answer a question. --store y/n--
If the screen is correct, enter 'y' and wait for message 'CHANGE IS STORED ON DISKETTE'. If the screen is not correct, enter an 'n' and go back to step 3.

5. Hit ENTER again if you want to display the new chain configuration.

The channel address configuration is complete.

Proceed with System Configuration

Press 'MOD SEL' to return to the MODE SELECTION screen. Continue with next step on page 6100, or continue with last step on page 6100 (Copy Configure) if configuration is completed with this step.

Display Example for 4331 Model 2 and 11

ALTER CHANNEL NUMBER								
XXXXX IS INDICATED IF NO ADAPTER ATTACHED								
ADAPTER NUMBER	0	1	2	3	4	5	6	7
ADAPTER TYPE	HSC	XXXXX	BMPX2	MPX	FTA1	BMPX1	XXXXX	BBA0
ADAPTER TYPE				CA				BBA1
CURRENT CHANNEL NUMBER	6	X	4	0	2	1	X	0
ALTER CHANNEL NUMBER:	.	.	.	0	.	.	.	0
16MB VSE TIMER: OFF DISK				DATA:		ADDR:		
TOD: SEC								
0700								

Errors for Alter Channel Number

- DUPLICATE CHANNEL NUMBER ----- Check screen. Only one of each channel number allowed.
- NO ADAPTER ATTACHED ----- You have entered a number under an 'x'.
- CHANNEL NUMBER NOT VALID ----- Only 1 through 6 are allowed.
- INVALID CHARACTER ----- Cursor will point to invalid area.
- CHANNEL 0 WAS SPECIFIED ----- Only MPX, CA, BBA 0 and BBA 1 can be channel 0.
- INVALID OR MISSING STORE COMMAND ----- Answer 'yes' or 'no' and hit ENTER.
- INCORRECT CONFIGURATION TABLE ----- You must copy config from a good diskette to correct this.
- CHANNEL 0 MUST NOT BE CHANGED ----- MPX, CA, BBA 0 and BBA 1 must be channel 0.

Configuration of Native Displays and Printers

How to Configure Native Displays and Printers

- Press MOD SEL to display the MODE SELECTION menu.
- Select NATIVE DISPLAYS AND PRINTER/ROCF. **1**
- Select NATIVE DISPLAY AND PRINTER CONFIGURATION. **2**
- Complete the DEVICE/ADR/L fields for each port to be used. (The chart on page 6018 can be used.) Valid entries are shown at the top of the screen.

- In the DEVICE-field enter the 4-digit device type.

Note: The initial setup for the operator console (port 00) is 3278/01F/1. If an IBM 3279-2C is to be connected as operator console, enter 3279 in the DEVICE-field for port 00.

- In the ADR-field enter the device address (X'009' through X'01F').
- In the L-field (language) enter the correct keyboard/language code (1 or 2) for the associated device. For terminal printers, only the language portion of the keyboard/language combination is taken when a '1' or '2' is entered. For line printers (IBM 3289 or 3262, for example) no language code needs to be entered.

When configuration data has been entered for each attached device, press ENTER, and wait for the message 'UPDATE COMPLETE, PRESS IML'. The screen now shows your current configuration. The configuration becomes active with the next IML which is normally performed after all diskette configuration actions (page 6100) have been completed.

Configuration of Native Displays and Printers is complete.

Proceed with System Configuration

Press 'MOD SEL' to return to the MODE SELECTION screen. Continue with next step on page 6100, or continue with last step on page 6100 (Copy Configure) if configuration is completed with this step.

1 NATIVE DISPLAYS AND PRINTERS/ROCF SUBSELECTION

2

```

          *NATIVE DISPLAYS AND PRINTERS*
          (DEVICE ADDRESS RANGE: X'009' - X'01F')

DEVICES ATTACHABLE: See actual screen display
XXXXXXXX MEANS NO DEVICE ATTACHED. TO DETACH DEVICE: KEY IN X UNDER DEVICE
FOR LANGUAGES FILL IN UNDER L: 1 FOR TYPEWRITER (UNITED STATES)
                               2 FOR DATA ENTRY 1 (UNITED STATES)

PORT DEVICE ADR L  PORT DEVICE ADR L  PORT DEVICE ADR L  PORT DEVICE ADR L
00 3278 01F 1  01 XXXXXXX XXX X  02 XXXXXXX XXX X  03 XXXXXXX XXX X
.....
04 XXXXXXX XXX X  05 XXXXXXX XXX X  06 XXXXXXX XXX X  07 XXXXXXX XXX X
.....
08 XXXXXXX XXX X  09 XXXXXXX XXX X  10 XXXXXXX XXX X  11 XXXXXXX XXX X
.....
12 XXXXXXX XXX X  13 XXXXXXX XXX X  14 XXXXXXX XXX X  15 XXXXXXX XXX X
.....

                               370 TIMER: ON  DISK      DATA:      ADDR:
                               TOD: SEC

0700
    
```

Display - Example

Note: If 8 Ports are available only, the message: Only 8 Ports effective will appear on screen on line 3.

Error Messages:

- 'INVALID CHARACTER' -----
- 'INVALID DEVICE NAME' ----- You can only attach the devices shown at top of the screen.
- 'INVALID DEVICE ADDRESS' ----- See 'DEVICE ADDRESS RANGE' on the screen.
- 'INVALID CONFIGURATION' ----- No more than two 3289s allowed.
- 'INVALID KEYBOARD LANGUAGE' ----- Only 1 or 2 allowed for 'L' field.
- 'DUPLICATE DEVICE ADDRESS' ----- This address is already used by another device.
- 'DUPLICATE DISKETTE ADDRESS' ----- This address is already used for the customer I/O diskette (see 'STM 6126').
- 'PORT 00 ALLOWS 3278 OR 3279' --- Specify 3278 or 3279 in the DEVICE field for port 00 (operator console).

CONFIGURE FTA 1 OR 3 - (DISK)

DISK ADDRESSES ARE USUALLY CONFIGURED IN PAIRS. IN OTHER WORDS, ONLY ONE ENTRY IS NECESSARY TO INSTALL DEVICE ADDRESSES '210' AND '211.' HOWEVER, SOME DISKS CAN HAVE JUST ONE DEVICE. THE LAST DIGIT (1 OR 2) OF DISK ENTRIES, INDICATES 1 OR 2 ADDRESSES USED.

CONFIGURE PROCEDURE

1. DISPLAY THE FTA 1 OR 3 CONFIGURE SCREEN.
 - A. ALT KEY WITH MOD SEL TO GET MAINTENANCE SELECTION SCREEN.
 - B. SELECT UTILITIES/REMOTE
 - C. SELECT FTA CONFIGURATOR
 - D. SELECT FTA1 OR FTA3
2. THE CHART ON THIS PAGE SHOWS A TYPICAL FTA 1 CONFIGURATION BLOCK.
3. THE 'SYSTEM CHART' (STM - 6019) DEFINES THE FTA ADDRESSES USED BY YOUR SYSTEM. FOR DISKS ON THE FTA, THE 9 DIGIT 'DEVICE' ADDRESS IS BROKEN DOWN IN THE FOLLOWING EXAMPLE FOR 3340 ADDRESS '210.'

2 = CHANNEL ADDRESS AS SHOWN AT THE TOP OF THE SCREEN.
 1 = CONTROL ADDRESS AS SHOWN AT THE LEFT OF THE SCREEN.
 0 = DEVICE ADDRESS AS SHOWN ABOVE THE ENTRY AREA OF THE SCREEN.
4. IF THE DISPLAYED INFORMATION MATCHES THE 'SYSTEM CHART', GO TO STEP 9.
5. TO CHANGE DISK ADDRESSES ON FTA

TO REMOVE ENTRIES:

FIND THE FIRST '33XX-XX' ENTRY IN EACH ROW THAT IS NOT USED BY YOUR SYSTEM. CHANGE THESE ENTRIES FROM '33XX-XX' TO 'R3XX-XX', TO ERASE THE REST OF THE STRING.

TO ADD ENTRIES:

CHANGE '.....' TO '33XX-X2' FOR EACH PAIR OF DEVICE ADDRESSES, OR '33XX-X1' FOR A SINGLE ADDRESS.
6. IF STRING SWITCH IS INSTALLED ON ANY CONTROL UNIT, CHANGE THE 'N' TO A 'Y' IN THE STRING SWITCH COLUMN.
7. HIT ENTER. THE SCREEN SHOULD NOW SHOW THE DEVICES FOR YOUR SYSTEM. IF AN ERROR MESSAGE IS DISPLAYED, CORRECT IT AND HIT ENTER AGAIN.

AN ERROR MESSAGE SUMMARY FOR FTA IS ON PAGE 6138.

8. YOU MUST NOW ANSWER A QUESTION. -- STORE Y/N --
 IF THE SCREEN IS CORRECT, ENTER 'Y' AND WAIT FOR THE DATA TO BE WRITTEN ON THE DISKETTE. IF THE SCREEN IS NOT CORRECT, ENTER 'N', AND GO BACK TO STEP 1 D.
9. ALT KEY AND MODE SEL WILL RETURN YOU TO THE MAINTENANCE SELECTION SCREEN.

THE FTA 1 (DISK) CONFIGURE ACTION IS COMPLETE

EXAMPLE OF A TYPICAL FTA 1 CONFIGURATION

CONFIGURATION BLOCK FOR FTA1, CHANNEL ADDRESS 2					
CONTROL ADDRESS	STRING SWITCH (Y/N)	DEVICE ADDRESS/TYP WITHIN STRING			
		0	2	4	6
0	.	.....	.....	.....	.....
1	N	3340-A2	3340-B2	3340-B2	3340-B2
2	.	.....	.....	.....	.....
3	N	3370-A1	3370-B1	3370-B1	3370-B1
4	N	3310-A1	.....	.....	.....
5	N	3310-A2	3310-B2	.....	.....
6	.	.....	.....	.....	.....
7	.	.....	.....	.....	.....

VALID DEVICE NAMES ARE:
 3310-A2 3310-B2 3340-A2 3340-B2 3344-B2 3370-A1 3370-B1
 3310-A1 3310-B1 3340-B1
 R ERASE REST OF STRING

1MB VSE TIMER:OFF DISK DATA: ADDR:
 TOD:SEC

0700

THIS EXAMPLE SHOWS:

3340'S USING ADDRESSES 210 THRU 217
 3370'S USING ADDRESSES 230 THRU 237
 3310 USING ADDRESS 240
 3310'S USING ADDRESSES 250 THRU 253

4 STRINGS ON THIS FTA, WHICH IS THE MAXIMUM ALLOWED.

FTA CONFIGURE ERROR MESSAGES

'XXX' NOT INSTALLED ERRORS

'FTA1 NOT INSTALLED' -----	} MEANS THAT THE FEATURE B/M IS NOT INSTALLED ON THE DISKETTE. FOR FEATURE B/M NUMBERS SEE PAGE PA015 IN VOL.30.
'FTA2 NOT INSTALLED' -----	
'FTA3 NOT INSTALLED' -----	
'DEVICE TYPE NOT INSTALLED' -----	
'STRNG SW. FEATURE NOT INSTALLED' -----	

INVALID ENTRIES OR DATA ERRORS

'COPY THE CONFIGURATOR' -----	YOU MUST COPY CONFIGURE FROM A GOOD DISKETTE. THE CONFIGURATION DATA ON YOUR DISKETTE IS INVALID
'INVALID CHARACTER' -----	CURSOR POINTS TO INCORRECT AREA
'INVALID ENTRY' -----	CURSOR POINTS TO INCORRECT AREA
'NO VALID FTA SPECIFIED' -----	CURSOR POINTS TO INCORRECT AREA
'CONTROL ADDRESS IS INVALID' -----	CURSOR POINTS TO INCORRECT AREA
'INVALID DEVICE TYPE' -----	CURSOR POINTS TO INCORRECT AREA
'DEVICE PATTERN INCORRECT' -----	CURSOR POINTS TO INCORRECT AREA
'INVALID OR MISSING STORE COMMAND' -----	'Y' OR 'N' NOT ENTERED TO ANSWER 'STORE Y/N.'

FEATURE DEPENDANT ERRORS

'A-BOX MUST BE DEFINED' -----	XXXX-AX MUST BE DEFINED SOMEWHERE IN THE STRING.
'ONLY ONE A-BOX PER STRING' -----	
'A1 BOX=NO B BOX. A2=ONLY 1 B BOX' -----	FOR 3310 - NO B BOX ALLOWED IF A1 BOX SPECIFIED. ONLY 1 B BOX ALLOWED IF A2 BOX SPECIFIED.
'STRING SWITCH NOT ALLOWED' -----	STRING SWITCH CANNOT BE USED WITH THIS DEVICE/CONTROLLER TYPE
'3340 CONTROL ADDR MUST BE 0 OR 1' -----	
'MAX 4 DISK STRINGS ALLOWED' -----	ONLY 4 CONTROL ADDRESSES ALLOWED
'8809 MUST BE EXCLUSIV ON FTA' -----	NO DISK ALLOWED ON FTA WITH 8809
'8809: MAX. DEVICE NUMBER = 6' -----	
'8809 STRING MUST BE CONTINUOUS' -----	
'8809 STRING MUST START WITH ZERO' -----	

CONFIGURE HSC SUBCHANNEL

HSC CONFIGURATION BLOCK, CHANNEL ADDRESS 6																
ADDRESS RANGE	FROM: 00 TO: 07	08 OF	10 17	18 1F	20 27	28 2F	30 37	38 3F	40 47	48 4F	50 57	58 5F	60 67	68 6F	70 77	78 7F
INSTALLED	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
ENTER: Y/N	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
UNSHARED	Y	.	.	.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	.	.
ENTER: Y/N	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BEGIN/FOLLOW	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
ENTER: B/F	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
SELECTOR MODE	N	.	.	.	N	N	N	N	N	N	N	N	N	N	.	.
ENTER: Y/N	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
DATA-STREAMNG MD	N	.	.	.	N	N	N	N	N	N	Y	Y	N	N	.	.
ENTER: Y/N	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
370 TIMER: ON DISK DATA: ADDR:																
TOD: SEC																
0700																

HSC CONFIGURATION BLOCK, CHANNEL ADDRESS 6															
SET "4 MICROSEC'S SELECT-OUT DOWN" N															
ENTER: Y/N															
START OUTBOUND WITH FULL BUFFER ONLY N															
ENTER: Y/N															
370 TIMER: ON DISK DATA: ADDR:															
TOD: SEC															
0700															

HSC CONFIGURATION BLOCK, CHANNEL ADDRESS 6																
ADDRESS RANGE	FROM: 80 TO: 87	88 8F	90 97	98 9F	A0 A7	A8 AF	B0 B7	B8 BF	C0 C7	C8 CF	D0 D7	D8 DF	E0 E7	E8 EF	F0 F7	F8 FF
INSTALLED	N	N	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N
ENTER: Y/N
UNSHARED	.	.	N	N	N	N	.	.	.	.	.	.	.	.	.	.
ENTER: Y/N
BEGIN/FOLLOW	.	.	B	F	B	F	.	.	.	.	.	.	.	.	.	.
ENTER: B/F
SELECTOR MODE	.	.	Y	Y	Y	Y	.	.	.	.	.	.	.	.	.	.
ENTER: Y/N
DATA-STREAMNG MD	.	.	N	N	N	N	.	.	.	.	.	.	.	.	.	.
ENTER: Y/N
370 TIMER: ON DISK DATA: ADDR:																
TOD: SEC																
0700																

DEVICES FOR SHARED/UNSHARED SUBCHANNELS

FOR INFORMATION ON WHICH I/O DEVICES REQUIRE A SHARED/UNSHARED SUBCHANNEL REFER TO THE COMPONENT DESCRIPTION OF THE I/O DEVICE.

HSC CONFIGURATION BLOCK ERRORS

'INVALID OR MISSING STORE COMMAND' ----- 'Y' OR 'N' NOT ENTERED TO ANSWER 'STORE Y/N.'

'NO VALID HSC SPECIFIED' -----

'HSC NOT INSTALLED' ----- MEANS THAT THE FEATURE B/M IS NOT INSTALLED ON THE DISKETTE. FOR FEATURE B/M NUMBERS SEE PAGE PA015 IN VOL. 30.

'SPECIFY BEGIN' ----- NO 'B' SPECIFIED FOR 1ST ADDRESS RANGE.

Configuration of the Loop

The loop configuration falls into two parts, the loop and the terminal configuration. The loop part is already pre-configured. The terminal part is to be configured by the customer. However, the CE should also be familiar with the configure procedure to be able to give assistance to the customer if requested.

The figure on this page shows how to select the TERMINAL DISPLAY AND UPDATE and the LOOP DISPLAY AND UPDATE screen display.

For details how to configure these screens or to change the configuration refer to Section 6 of STM Features, Volume 15. Further information can be found in the following manuals:

IBM 4331 Multiuse Communication Loop Operating Procedures, No.

GA33-1538

IBM 4331 Multiuse Communication Loop Functional Characteristics No.

GA33-1534

The loop is configured by default with the values shown. The screen display in the figure shows the maximum configuration. The actual display shows only the loop(s) that are attached.

```

                *MODE SELECTION*

P PROGRAM RESET          D DISPLAY/ALTER
C CLEAR RESET           L PROGRAM LOAD
S STORE STATUS          A ADDRESS COMPARE
R RESTART               K CHECK CONTROL
I INSTR STEP           J INTERNAL TIMER
N RESET 1-STEP         M NATIVE DISPLAYS AND PRINTERS
Y TOD ENABLE           G USER DISKETTE CONTROL
F LOOP ADAPTER         H DISKETTE DEVICE ADDRESS
                       E COMMUNICATION LINES

SELECTION:
MAN          370 TIMER:ON      DATA: 0000  ADDR: 000000
              TOD:SEC
              LOOP MSG
    
```

F
↓

```

LOOP ADAPTER CONFIGURATOR  SELECTION MENU
A  TERMINAL PARAMETERS DISPLAY AND UPDATE
B  LOOP   PARAMETERS DISPLAY AND UPDATE
C  INLINE TESTS

SELECTION:
MAN          370 TIMER:ON      DATA: 0000  ADDR: 000000
              TOD:SEC
              LOOP MSG
    
```

```

LOOP ADAPTER CONFIGURATION  TERMINAL DISPLAY AND UPDATE  PAGE XXXX

DATA LINK 1  PORT ADDR: 0A

STAT TERMINAL  SUB- LU  TERM  STAT TERMINAL  SUB- LU  TERM
ADDR          CHNL ADDR PARA ADDR          CHNL ADDR PARA

XX  XXXXXXXX  XX  XX  XX  XX  XXXXXXXX  XX X XX X XX
..  .....  ..  ..  ..  ..  .....  ..  . . . . .

XX  XXXXXXXX  XX  XX  XX  XX  XXXXXXXX  XX X XX X XX
..  .....  ..  ..  ..  ..  .....  ..  . . . . .

XX  XXXXXXXX  XX  XX  XX  XX  XXXXXXXX  XX X XX X XX
..  .....  ..  ..  ..  ..  .....  ..  . . . . .

XX  XXXXXXXX  XX  XX  XX  XX  XXXXXXXX  XX X XX X XX
..  .....  ..  ..  ..  ..  .....  ..  . . . . .

PRESS PF 1 KEY FOR BUFFER  DEC XXX DATA BUFFERS AVAILABLE
STATISTICS                  *) See Note

                S Y S T E M      A R E A
    
```

```

LOOP ADAPTER CONFIGURATOR  LOOP DISPLAY AND UPDATE

PASSWORD: _____ *  NUMBER LOOP MESSAGES: 0050

LOBE 1  LOBE 2  PACING  NRZI  HALF  MODEM  PERM  POLL
ACTIVE  ACTIVE  T/O    SPEED  WRAP  REQ TO  T/O
                SEND  MASK

LOOP 1  Y      N      X 10
        -      -      X --

LOOP 2  Y      N      X 10
        -      -      X --

LINK 1                X 10  Y  N  Y  Y  X 0A
                    X --  -  -  -  -  X --

LINK 2                X 10  Y  N  Y  Y  X 0A
                    X --  -  -  -  -  X --

                S Y S T E M      A R E A
    
```

A
B

*) Note: The value is configuration dependent and shows how many data buffers are left.

COPY CONFIGURE

COPY CONFIG PROCEDURES ARE PROVIDED SO THAT MANUAL CHANGES ARE MADE ON ONLY ONE DISKETTE. THE UNCHANGED AND NEW DATA CAN THEN BE COPIED TO ALL OTHER DISKETTES, ELIMINATING THE POSSIBILITY OF MANUAL DIFFERENCES BETWEEN DISKETTES.

THIS PROCEDURE IS CONTROLLED BY MAP FE90, AND THE 'COPY CONFIGURATOR' SELECTION FROM THE MAINTENANCE SELECTION SCREEN. THE MAP INTERPRETS THE STEPS DISPLAYED ON THE SCREEN, AND TELLS YOU WHICH DISKETTE TO INSERT FOR EACH STEP. IT ALSO DIRECTS THE TESTING OF THE DISKETTES AFTER THE DISKETTES HAVE BEEN WRITTEN.

COPY CONFIGURATION IS NECESSARY IN THE FOLLOWING CASES:

1. INSTALLATION OF A NEW SYSTEM
2. CHANGE CONFIG DATA ON ONE DISKETTE
3. NEW DIAGNOSTIC DISKETTE
4. EC INSTALLATION
5. EMERGENCY DISKETTES
6. MES WITH CONFIGURE CHANGE

CHARTS ON THE FOLLOWING PAGES DESCRIBE EACH OF THE POSSIBLE COPY CONFIGURATION PROCEDURES. THEY ARE FOR REFERENCE AND ARE NOT NEEDED TO DO THE COPY CONFIGURE.

COPY CONFIGURE PROCEDURE

1. DISPLAY THE COPY CONFIGURE SCREEN
 - A. ALT KEY AND MOD SELECT TO GET THE MAINTENANCE SELECTION SCREEN.
 - B. SELECT UTILITIES/REMOTE
 - C. SELECT 'COPY CONFIGURATOR'
2. GO TO MAP FE90 AS INSTRUCTED BY THE SCREEN MESSAGE.

THE CONFIGURE PROCESS WILL BE COMPLETED BY FOLLOWING THE FE90 MAP.

LV: 79269212	COPY SYSTEM CONFIGURATOR		
NEW CONTROL, OR ALL NEW.....: A	OC->C1->C2->D		
NEW DIAGNOSTIC.....: B	C-->D		
CHANGE ON CTL, OR INSTALLATION, OR MES-END.: D	C1->C2->D		
MES-START.....: G	OC->C1		
OPERATE AS INSTRUCTED BY MAP FE90			
SELECTION:	370 TIMER:OFF DISK	DATA:	STEP: 00
	TOD:SEC	ANSWER	ADDR:
2051			

COPY CONFIGURE CHARTS (CONTINUED)

COPY CONFIGURE STEPS - CHART 2

CHART 2 ENTRY	COPY STEP/DISK	MANUAL/ DISK NOTE 2	COPY CONFIGURATION STEP AND CORRECT DISKETTE STEP/DISK			
1			A1/OC	A2/NC	A3/NB	A4/ND
2			A1/OC	A2/NC	A3/NB	A4/OD
3			A1/OC	A2/NC	A3/NC	A4/ND
4			A1/OC	A2/NC	A3/NC	A4/OD
5			B1/OC	B2/ND		
6		M /NC	D1/NC	D2/NB	D3/ND	
7		M /NC	D1/NC	D2/NB	D3/OD	
8		M /NC	D1/NC	D2/NC	D3/ND (NOTE 1)	
9		M /NC	D1/NC	D2/NC	D3/OD (NOTE 1)	
10		M /OC	D1/OC	D2/OB	D3/OD	
11	G1/OC G2/NC	M /NC	D1/NC	D2/NB	D3/ND	
12	G1/OC G2/NC	M /NC	D1/NC	D2/NB	D3/OD	
13	G1/OC G2/NC	M /NC	D1/NC	D2/NC	D3/ND (NOTE 1)	
14	G1/OC G2/NC	M /NC	D1/NC	D2/NC	D3/OD (NOTE 1)	

KEY TO DISKETTE TYPE

	BACK		
CTRL	UP	DIAG	
OLD	OC	OB	OD
NEW	NC	NB	ND

NOTE 1:

ENTRY 8, 9, 13 AND 14 WILL NOT PRODUCE A CURRENT BACK-UP CONTROL DISKETTE. THIS SHOULD ONLY HAPPEN UNDER SPECIAL CIRCUMSTANCES, SINCE 2 CONTROL DISKETTES SHOULD BE FURNISHED IF THE OLD CONTROL DISKETTE CANNOT BE USED FOR BACK-UP.

NOTE 2:

THE 'M' IN THIS CHART REFERS TO ANY MANUAL KEYBOARD CONFIGURATION. EC OR MES OR INSTALL PROCEDURES WILL TELL YOU EXACTLY WHAT TO MANUALLY CONFIGURE. EACH SCREEN IS EXPLAINED IN DETAIL IN THIS STM SECTION. SEE THE TABLE OF CONTENTS FOR ANY PARTICULAR CONFIGURE SCREEN.

MES UPDATE WITHOUT A NEW DISKETTE

FOR MES UPDATES WHICH REQUIRE ONLY A HW CONFIGURATOR UPDATE TO MATCH THE SYSTEM HARDWARE CONFIGURATION, NO NEW DISKETTES ARE SHIPPED. THE 'MES UPDATE' SCREEN IS USED TO MAKE THE NECESSARY CHANGES TO THE HARDWARE CONFIGURE RECORD.

CONFIGURE PROCEDURE

1. INSERT CONTROL DISKETTE AND DISPLAY THE MES UPDATE SCREEN
 - A. ALT KEY AND MOD SEL TO GET THE MAINTENANCE SELECTION SCREEN.
 - B. SELECT 'UTILITIES/REMOTE'
 - C. SELECT 'MES UPDATE'
2. THREE SCREENS WILL APPEAR MOMENTARILY.
3. WAIT FOR THE MES UPDATE SCREEN TO BE DISPLAYED.
4. ALTER SCREEN AS DIRECTED BY THE MES INSTRUCTIONS.

- 1) ADD OR DELETE FEATURES.

IF CS TYPE 0 IS INSTALLED (2 QA5 CARDS) ENTER 'Y' BELOW 32 K FIELD.
 IF CS TYPE 1 IS INSTALLED (1QS2 CARD) ENTER Y BELOW 32K AND QS2 FIELD.

- 2) INDICATE BSM CARD LOCATIONS.

CARD LOCATION ENTRIES ARE IGNORED UNLESS A MEMORY SIZE IS INDICATED WITH A 'Y' in the PUT field under 1).

THERE ARE 8 VALID COMBINATIONS OF BSM SIZE AND CARD LOCATION. THE CARD LOCATIONS PLUGGED IN YOUR BSM BOARD B1 MUST MATCH ONE OF THE COMBINATIONS SHOWN IN THE TABLE BELOW THE SCREEN PICTURE. ALL BSM CARDS ARE 512K PER CARD EXCEPT AS NOTED. SEE PLUGGING CHART IN VOL 30 FOR CARD PART NUMBERS.

NOTE: IF MEMORY SIZE OR CARD LOCATIONS ARE CHANGED FOR DIAGNOSTIC PURPOSES, THIS SCREEN MUST BE USED TO MAKE THE MICROCODE MATCH THE NEW PHYSICAL CONFIGURATION OF THE BSM.

5. HIT ENTER TO WRITE THE CONFIGURE DATA ON THE DISKETTE.

IF ERROR MESSAGE IS DISPLAYED, CHECK THE CHART BELOW THE SCREEN PICTURE FOR THE VALID BSM SIZE/CARD LOCATION ENTRIES.

6. IML THE SYSTEM. IML IS NECESSARY BECAUSE THE PU IS STOPPED TO DISPLAY THE MES UPDATE SCREEN.

THE MES UPDATE OF ONE DISKETTE IS COMPLETE

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4331 - 2

STM

```

MES UPDATE:
1) PUT .=Y/N IF FEATURE INCOMING / OUTGOING
   CS: 16K 32K QS2  BSM: 1M 2M 3M 4M  NDSEXT:  SP1:  MPX:  BMPX1:  BMPX2:
   IS:  .  Y  .  .  Y  .  .  Y  .  .  Y  .  .  Y  .  .  Y
   PUT:  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .

2) IF BSM IS AFFECTED:  PUT .=Y/N IF CARD IS IN/OUT ON LOCATIONS
   B1- L2 M2 N2 P2 Q2 R2  T2 U2.
   IS :  N  N  N  N  N  N  N  Y  Y
   INVALID, SEE STM **>  PUT:  .  .  .  .  .  .  .  .  .

3) ENTER.

                                370 TIMER:ON          DATA:          ADDR:
                                TOD:SEC              STOPPED

0700
    
```

ERROR MESSAGES:

'INVALID, SEE STM **>' SEE CONFIGURE SECTION ---CARD LOCATIONS DO NOT MATCH BSM SIZE - SEE CHART FOR VALID COMBINATIONS.

BSM SIZE ENTERED IN 1)		VALID CARD LOCATIONS TO BE ENTERED IN 2)							
BSM: 1M 2M 3M 4M		MS CARDS PLUGGED IN BOARD B1 LOC: L2 M2 N2 P2 Q2 R2 T2 U2							
	X X X X	X	X	X	X	X	X	X	X
1M	Y X X X	N	N	N	N	N	N	Y	Y
2M	X Y X X	N	N	N	N	Y	Y	Y	Y
	X Y X X	N	N	N	N	N	N	Y	Y
3M	X X Y X	N	N	Y	Y	Y	Y	Y	Y
	X X Y X	N	N	Y	Y	N	N	Y	Y
4M	X X X Y	Y	Y	Y	Y	Y	Y	Y	Y
	X X X Y	Y	Y	Y	Y	N	N	Y	Y
	X X X Y	N	N	Y	Y	N	N	Y	Y

NOTE 1

NOTE 1

NOTE 1

NOTE 2

NOTE 1 - REQUIRES 1 MB CARDS IN POS T2 AND U2

NOTE 2 - REQUIRES 1 MB CARDS IN POS N2, P2, T2 AND U2.

DEVICE RESTRICTIONS ON THE 4331

1. SOME DEVICES ARE NOT SUPPORTED AT ALL ON THE 4331.
2. SOME DEVICES ARE NOT SUPPORTED IN COMBINATION WITH OTHER DEVICES. THESE ARE CALLED EXCLUSIVITIES.
3. SOME DEVICES ARE SUPPORTED, BUT WITH RESTRICTIONS.

OVERRUN PROBLEMS ARE VERY OFTEN CAUSED BY INCORRECT ADDRESS ASSIGNMENT TO A SUPPORTED DEVICE.

MORE DETAILED INFORMATION IS AVAILABLE FROM THE SALES MANUAL, SYSTEM ASSURANCE DOCUMENTATION. IF YOU THINK YOU HAVE PROBLEMS CAUSED BY INCORRECT DEVICES OR INCORRECT COMBINATIONS OF DEVICES, YOU MAY BE ABLE TO SOLVE THEM BY CHECKING THE INFORMATION IN THIS SECTION. IF YOU STILL HAVE PROBLEMS, CHECK WITH YOUR SUPPORT CENTER, SYSTEM ASSURANCE REP, OR SALESMAN.

NOT SUPPORTED

1. 2841/2311 ON BYTE CHANNEL
2. 2804

EXCLUSIVITIES

1. 14XX EMU WITH VMA
2. 3340/3370 STRING SWITCH WITH ANY DISK EMULATOR
3. 231X ON BMPX WITH HSC

LIMITATIONS

1. FTA/3370 - POSSIBLE PERFORMANCE LIMITATION.
- SEE CHANNEL CHARACTERISTICS MANUAL.
2. 231X ON BMPX WITH CA GREATER THAN 9600 BAUD/SEC - PERFORMANCE LIMITATION.
3. HSC WITH CA GREATER 9600 BAUD/SEC - PERFORMANCE LIMITATION.

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FORM

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