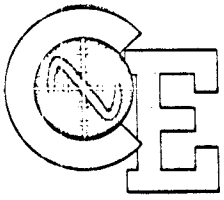


Diagnostic Engineering Publication

1410/7010

Volume 3.00

IBM POUGHKEEPSIE

Dept. B59, Bldg. 965
Date 11/15/63

Diagnostic Engineering Publication

1410/7010

Subject: **Diagnostic Program** ST01B - 1410/7010 System Test - 20K or Greater

Sequence Number 155
Replaces ST01A

This Program replaces and obsoletes ST01A.
This program requires System card 4 channel control cards.
These cards must be inserted Prior to running.

System Control Card	ST01	001
Channel one control card	ST01	002
Channel two control card	ST01	003
Channel Three control card	ST01	004
Channel four control card	ST01	005

Enclosures: 113 Pages
340 Card Deck for CARD ONLY SYSTEMS (as punched by UP51)
8 Cards - Card Loader (1-7) and 1 Core Clear
340 Cards No. 001-340 Data Cards
1 Card Execute Card

Distribution:
X 1410
X 7010
Other 20K memory or greater

S T O 1 B

1410/7010 SYSTEM TEST

11/15/63

This program will operate on any 1410 or 1410 with 1411 accelerator feature (No. 1007), or 7010 systems with 20K- 100K memories.

This program must have the system and 4 channel control cards containing this system configuration punched before running this program.

For systems using card input, the cards to be punched are as follows:

System Control Card	Card No. ST01B 001
Channel One Control Card	Card No. ST01B 002
Channel Two Control Card	Card No. ST01B 003
Channel Three Control Card	Card No. ST01B 004
Channel Four Control Card	Card No. ST01B 005

CONTENTS OF STO1

ST01

1410/7010 SYSTEM TEST

3.xx.00.0 TEST DESCRIPTIONS

00.1 Modifications

Corrects initialization errors in the prior level

00.2 Description

This program assumes that CPU and memory are operating correctly. This program will test sequentially 1 to 4 channels or combinations thereof, and their associated I/O units, in unoverlap and /or overlap mode.

Testing in overlap mode is similar to unoverlap except that CPU operations are going on during an I/O operation.

See Section 3.xx.C3.0-7 for special instructions for specific units.

00.3 Equipment

7010/1410 or 1410 with 1411 accelerator feature (no.-1007)
20K memory (minimum size)
1415 console printer
1402 reader/punch
1442 serial card reader
1403 printer
729 and/or 7330 tape drives
1301 file
1311 Impac Model V disk and control unit and 1311 Impac Model II

00.4 Card Deck

7-load cards	LIA - standard 7010 Loader
1-core clear	
340 -program deck	
1-execute	(Branch to 2000)

00.5 E.C. Level of Machine

Not Applicable

3.xx.01.0 Loading Procedures

A. Loading Procedure from Card Without Load Button on 7010/1410.

1. Display Memory Location 00000.

2. Alter to:

```
v v           v
RL % 1100011$.   if the card reader is on channel 1,
v v           v
XL 1100011$.     if the card reader is on channel 2.
```

or

3. Set to Run, press Computer Reset and Start.

B. Loading Procedure from Cards with Load Button on 7010

1. Computer Reset

2. Depress Load Button

C. Loading Procedure from Tapes without Load Button on 7010/1410

1. Display Memory Location 00000

2. Alter to:

```
v v           v
RL% B000011$.    if TU 0 is on channel 1,
v v           v
XL B000011$.     if TU 0 is on channel 2,
vv            v
3L? B000011$.    if TU 0 is on channel 3,
vv            v
1L! B000011$.    if TU 0 is on channel 4.
```

or

or

3. Set to Run, press Computer Reset and Start.

D. Loading Procedure from Tapes with Load Button on 7010

1. Computer Reset

2. Depress Load Button

E. Refer to the Load Program Write-Up, Listings for specific details.

3.xx.02.0 Operating Procedures

System and Channel Control Cards

System and 4 channel control cards must contain the system configuration for correct program operation (see listing Pages 5 thru 13 for punching these cards, or 1410/7010 INTRODUCTION).

For normal operation NO TADS need be entered

Make ready all units to be tested

Use of Standard Tads is as follows:

Normal Tads

	Location			
Tad 0	01000	OFF	1	Typeout
		ON	1	Bypass typeouts
Tad 1	01001	OFF	1	Proceed to next routine
		ON	1	Repeat the routine
Tad 2	01002	OFF	1	Bypass error halts
		ON	1	Halt on errors
Tad 3	010033	OFF	1	One pass of program
		ON	1	Repeat program

Normal operation of this program requires TADS 0-3 TO BE OFF. (1)

Special Tads are as follows:

	Location			
Tad 4	01004	OFF	1	Test in unoverlap mode
		ON	1	Bypass testing in unoverlap mode
Tad 5	01005	OFF	1	Test in overlap mode
		ON	1	Bypass testing in overlap mode

The special tads are in the OFF (1) condition for normal testing. The operator need make no changes and program operation is as follows: Unoverlap mode is tested, and if overlap feature is available, overlap mode will be tested.

If the operator desires he may enter a 1 at 01004 to bypass testing unoverlap mode OR ENTER a 1 at 01005 to bypass testing overlap mode.

3.xx.03.0 Operating Hints, Comments

03.1 Looping a Routine

Once the operator has changed TAD 1 to 1 so that a routine chan be repeated, the following method for exiting the routine should be used:

Press Inquiry Request; and when the machine hangs up in a read console printer loop, enter the address to be altered, Inquiry Release, Inquiry Request, enter data, Inquiry Release and the program will continue in its logical flow.

03.2 Punching or Printing

By altering the program as follows the constant used to control the punching of cards or lines of printing may be altered. Punch and print constant normally is set at 00080; this constant located at address 16331 may be altered to punch or print as many cards or lines as desired (up to 99999). A word mark must be entered with the character in the ten thousands position.

03.3 Store and Restore I/O Status

Store and restore I/O status indicators is only done if the machine is a 7010. As soon as machine type is determined the store, restore is performed if 7010 and then memory positions containing this routine are cleared and used for a work area. If system is not a 7010, the routine is bypassed and the area cleared immediately.

03.4 Typewriter Routine

This routine is done only once, and only in unoverlap mode. The area is then cleared and used as a work area.

03.4 Inquiry

Branch on Inquiry instructions are in most routines. This instruction will branch to the program alter routine and hang up in a read console printer loop waiting for the operator to enter the address to alter. Enter address-Release Inquiry Request-Enter Data-Release. The program continues. This routine can be used to alter tads or any portion of the program.

03.5 Not Ready Condition

During any I/O routine, if the unit being tested goes not ready, a message indicating this will be typed out and the unit bypassed.

03.6 1311 IMPAC

All 1311 Impac drives that are ready will be tested.

Scratch packs should be used on the drives as the program uses CYLINDER 3 and any data on that CYLINDER WILL BE DESTROYED.

For correct operation of the 1311 routines the WRITE INHIBIT SWITCH on the console MUST BE OFF.

The program will type out the channel and drive number of each ready drive tested.

03.7 7631 and 1301 Files

The operator must set the 7631 switches as indicated by the typeouts. Incorrect results will occur if they are not set and data on the disk could be destroyed.

03.8 Tapes

The operator must make ready the tapes to be tested. Be sure none to be tested are file protected. Drive 0 will not be tested on any channel. CLEAN ALL TAPE DRIVES BEFORE RUNNING THIS TEST.

03.9 If the system is 7010 check is made during an overlapped I/O operation to see that issuing Store and Restore CPU STATUS instructions do not bring up Compute Disable.

03.9A If the system is 7010 a check is made during an overlapped I/O Type instruction to see that issuing a Store Channel Status instruction will bring up Compute Disable.

03.9B RUNNING TIME approximately 3 minutes on 7010, 4-5 minutes on 1410 with 2 channels with 1415 Console Printer, 1402 Reader/Punch, 1403 Printer and 2 729 Tapes on channel 1, and 2 729 Tapes on channel 2.

3.xx.04.0 Program Stops

04.1 Normal Halts

03335	-	To allow operator to remove punch cards and place them in reader start to continue.
10863	-	To allow operator to set 7631, HAO switch on and write inhibit off, and format to write-start to continue
12023	-	To allow operator to set 7631 WR inhibit switch on.

04.2 Error Halts

See Listing for all Error Halts.

04.3 Restarts

At the beginning of each major I/O routine (tape, punch, printer, reader, files) a restart address for that routine is moved to locations 1 thru 6.

3.xx.05.0 Typeouts

ST01A

The above typeout occurs only upon initial program loading and is the program identification.

TESTING CHAN - 1 UNOVERLAP MODE

TESTING CHAN - 2 OVERLAP MODE

The above typeouts indicate the channel and mode being tested.

PLACE CDS FROM NORMAL PUNCH POCKET IN RDR IF RDR

TO BE TESTED - TURN ON RDR EOF-START

The above typeout occurs at the end of the punch routine.

CHAN 1 TPS RDY - 1 4 7 9

The above typeout occurs if the channel control card indicated that tapes were available on this channel.

TD 1

TD 2

The above typeout indicates which drive is being tested. These typeouts appearing sequentially with no other typeouts between them indicate a error free pass on the drive designated TD1

SET CH. 1, 7631 SWS. -------- WR INHIB ON.

SET CH. 1, 7631, SW's -------- HAO ON, WR INHIB OFF, FORMAT TO WR.

The above typeouts occur if 1301 is being tested. The operator must do what the typeout indicates.

TST 1311 CHN - 20

TST 1311 CHN - 22

The above typeout indicates the 1311 being tested on channel 2. If the above typeouts occur in sequence this indicated an error free pass on the first drive indicated.

STO1 COMPLETE

The above typeout occurs if TAD 0 is 1 (OFF). Indicates program completion.

3.xx.05.1 General Error Typeouts

NO MODE SET-INQUIRE-STORE STO1 SPECIAL TADS.

The above typeout occurs if both special tads were ON (1). Following this typeout the machine hangs upon a read console printer loop. Operator must decide what mode to test.

NO CHANNELS SET-INQUIRE-STORE CHANNELS SEQUENTIALLY.

The above typeout occurs if no channels have been indicated on the

system control card. Following this typeout, machine will hang up in a read console printer loop. Operator must store the channels available on the system.

NO UNITS SET OR RDY CHAN 1.

The above typeout indicates that the channel control card did not specify what units were on that channel or that no units were found ready. The program will continue to the next channel.

FAILED TO BR OVERLAP

This message indicates that an overlaped I/O instruction was given, but that the overlap in process latch failed to come on therefore a branch overlap in process FAILED.

BRANCHED OVERLAP

This message indicates that a branch overlap in process took place when it should not have.

OVERLAP COMPUTE TIME IS ZERO

This message indicates that during an overlaped I/O instruction, no compute time was available.

3.xx.05.2 Printer Error Typeouts

CHAIN TYPE NOT SET-INQ-STORE A-ALPHA N-NUM

The above typeout occurs if the chain type is not indicated on channel control card. Machine hangs up in read console printer loop-operator must store chain type, A-Alpha, N-Numeric.

BUFFER SIZE NOT SET-INQUIRE-STORE 1 or 2.

Above typeout indicates that buffer size is not indicated on channel control card. Machine hangs up in read console printer loop. Operator must store 1 or 2 to indicate 100 or 132 character buffer.

PRINTER 1 2 4 8 A B

Above message indicates a printer failure and the 1248AB represent I/O channel status indicators. It can also indicate an initial not ready condition.

3.xx.05.3 PUNCH-ERROR TYPEOUTS

PUNCH 1 2 4 8 A B

This message indicates either that the unit was initially not ready or that an error occured. 1 2 4 8 A B indicates the I/O status indicators.

3.xx.05.4 Reader-Error Typeouts

1402 RDR 1 2 4 3 A B

This message can indicate either an initial not ready condition or an error. The 1 2 4 8 A B characters indicate the I/O status indicators

CD IS- Data Read

CD SB- Memory Data

Above message indicates that a compare error existed between the card read and the memory field. CD IS - is the card just read. CD SB is the memory field.

This may indicate a card out of sequence in the read deck or that a punch error occurred, or a legitimate read error.

3.xx.05.5 Tape Error Typeouts

M% U 1 1 7 5 3 1 R ADDR 08591 1 2 4 8 A B

This message indicates a tape error. The operation was read tape even parity. The instruction is the one that caused the error. The address is the address of the instruction. The 1248AB show what indicators were on as a result of the operation.

EXPECTED EOF NOT INDICATED

This message indicates that an EOF was expected during a routine and that it was not indicated.

NO DATA CHK DURING RD TM ODD PARITY.

This message indicates that a data check did not occur as was expected.

NO EOF DURING RD TM ODD PARITY

This message tells that EOF failed to come up upon reading TM in ODD parity.

WLR EXPECTED - WAS NOT INDICATED

This message indicates that a WLR was forced and the I/O status indicator did not come on.

CMP ERROR DISPLAY - RD ADDR ----------WR ADR----------

This message tells that a tape record read into memory did not compare with what was written. If a tape WR error occured this error may also be indicated.

L MODE FAILED - NO WORD MARK FIRST CHAR.

This indicates that during a read tape in load mode a word mark did not come in with the first character of the record.

BSP OVER 2 RECORDS INSTEAD OF 1

This above message indicates that BSP failed and that it backspaced too far.

SKIP FAILED

The above indicates that during a skip operation skip failed.

WR END MEM FAILED-M MODE EVEN-END ADDR---------

This message indicates a failure during WR end of memory, move mode, even parity. End address is address at completion of operation.

UNEXPECTED EOF-RADICAL WAS SECOND CHAR.

The above indicates that EOF came on during the reading of a record with a radical sign as the second character.

BR INTERNAL INDICATOR D MOD-K FAILED

The above indicates that using a J (I) K to test for end of file a branch was not taken.

BR INTERNAL INDICATOR D MOD-K DID NOT SET IT OFF.

The above indicates that internal indicator was on and that the J (I) K instruction did not turn it off.

RD END OF RECORD FAILED-WMGM IN RD FLD.

The above indicates that a read to end of record did not replace a WMGM found in the read field.

3.xx.05.6 1301 and 7631 ERROR MESSAGES

DATA READ DOES NOT COMPARE WITH DATA WRITTEN

The above is the result of comparing the known data which was written and the data read back from the 1301.

1301 M% 16989R-IND. SET. 1248AB--ADDR----------

The above indicates the operation performed and the indicators found on (1248AB) and the address that was being used.

FAILED TO SEEK ADDR ----------

The above message indicates a seek failure and indicates the seek address.

3.xx.05.7 1311 IMPAC ERROR MESSAGES

1311 FAILED TO SEEK TO CORRECT LOCATION

The above indicates that the 1311 did not seek to correct track.

1311 M% F0 16990W - IND. SET. 1248AB---ADDR----------

The above indicates the operation performed and the indicators found on (1248AB) and the address that was being used.

1311 SCAN EQ. FAILED

The above indicates that during testing of the 1311 scan feature, scan Equal failed.

1311 SCAN HI. FAILED

During testing of 1311 scan feature the scan high failed.

1311 SCAN LO. FAILED

During testing of 1311 scan feature the scan low failed.

SEEK OVERLAP FAILED-CANT ST. 2 FILES IN MOTION

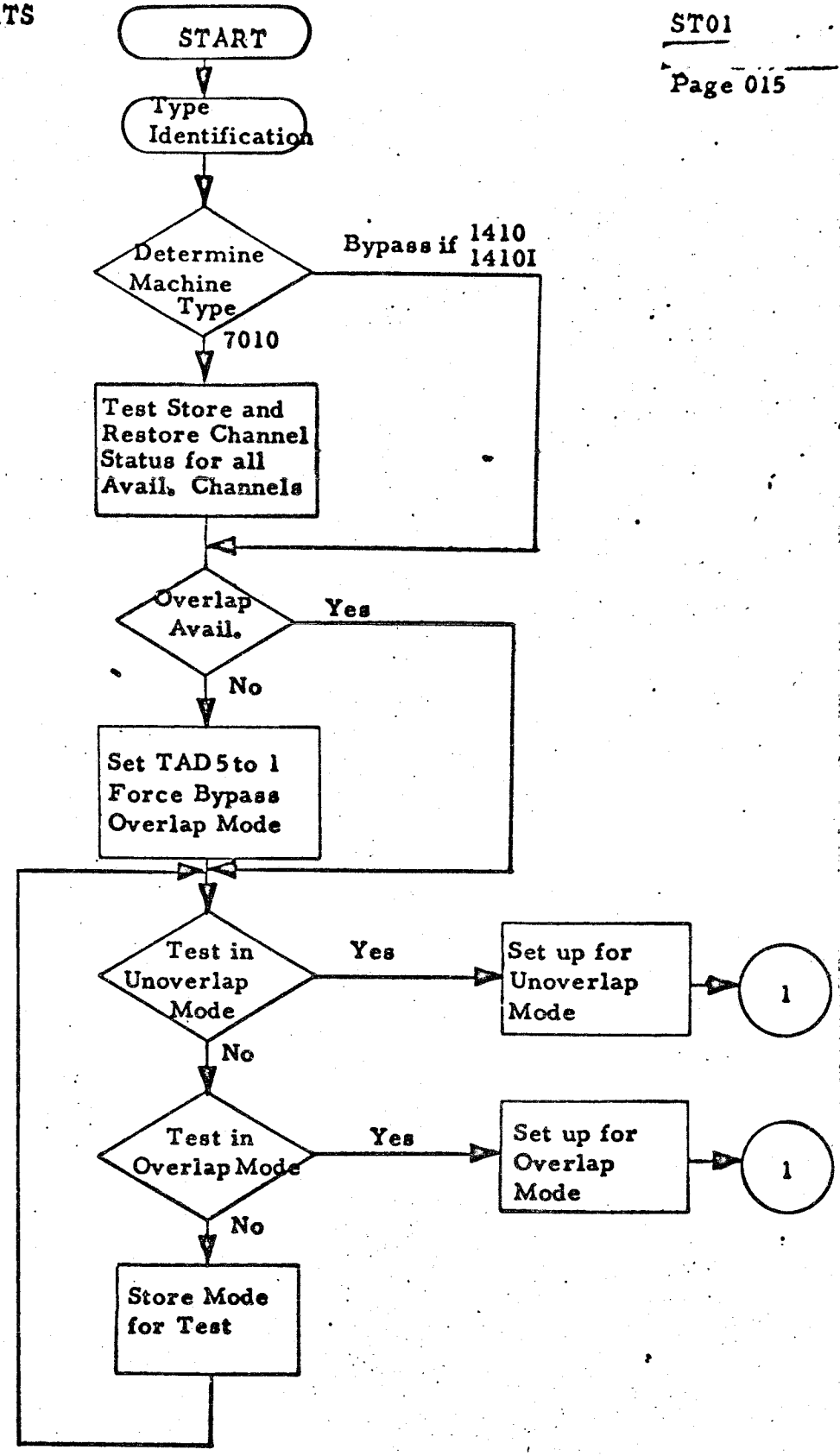
This message indicates a failure in the seek overlap feature. 2 files were not able to be set in motion at the same time.

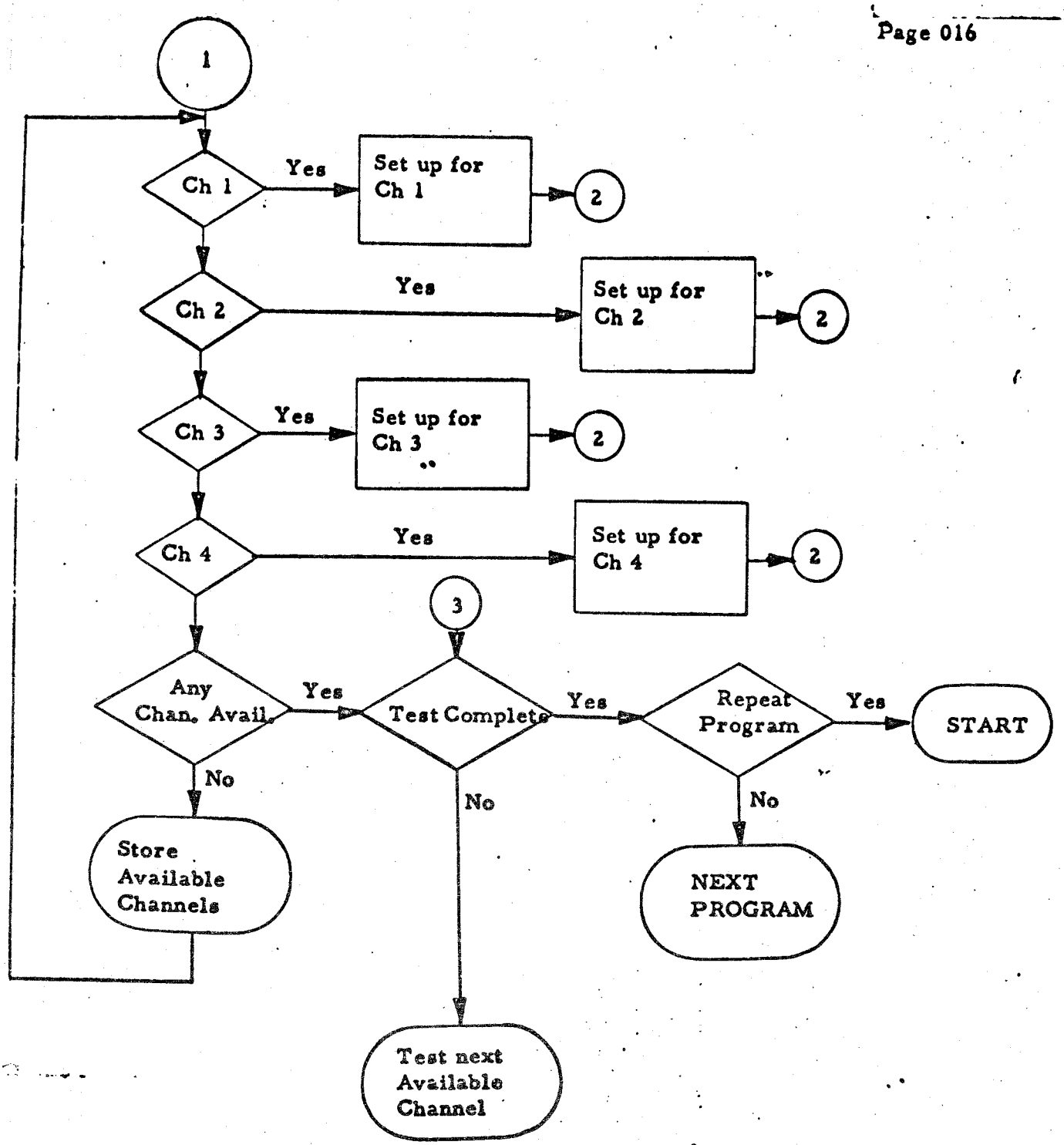
3.xx.05.8 STORE CH-STATUS - DID NOT COMPUTE DISABLE

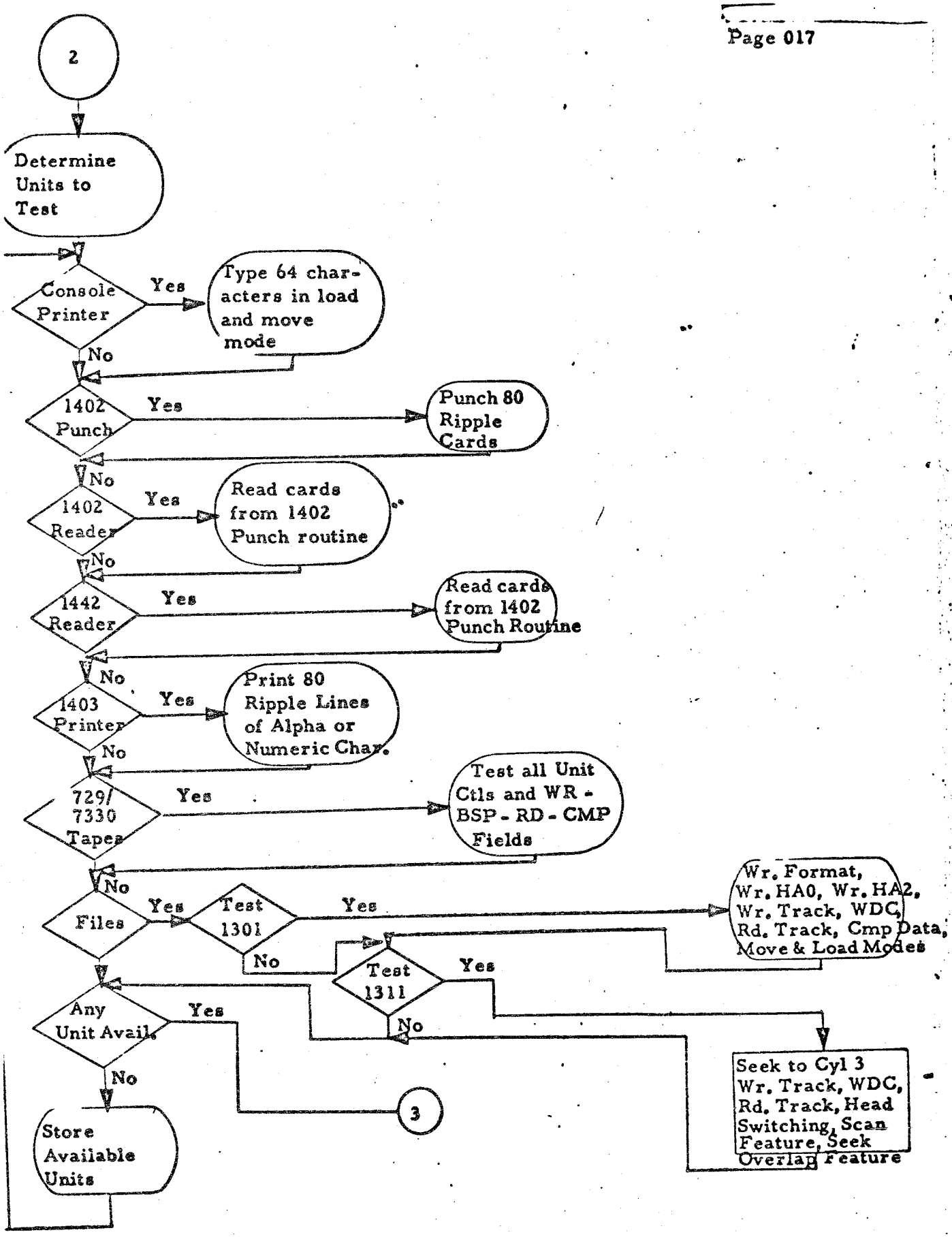
The above typeout indicates that Compute Disable should have been up and was not.

3.xx.05.9 CPU STORE/RESTORE CAUSES COMPUTE DISABLE

The above typeout indicates that issuing a Store/ Restore CPU Status instruction during an overlapped I/O instruction causes Compute Disable to come up.


START
Type Identification
Determine Machine Type
Bypass if 1410 1410I
7010
Test Store and Restore Channel Status for all Avail. Channels
Overlap Avail.
Yes
No
Set TAD 5 to 1 Force Bypass Overlap Mode
Test in Unoverlap Mode
Yes
Set up for Unoverlap Mode
1
No
Test in Overlap Mode
Yes
Set up for Overlap Mode
1
No
Store Mode for Test


1
Ch 1
Yes
Set up for Ch 1
2
Ch 2
Yes
Set up for Ch 2
2
Ch 3
Yes
Set up for Ch 3
2
Ch 4
Yes
Set up for Ch 4
2
3
Any Chan. Avail.
Yes
Test Complete
Yes
Repeat Program
Yes
START
No
No
No
Store Available Channels
NEXT PROGRAM
Test next Available Channel


2
Determine Units to Test
Console Printer
Yes
Type 64 characters in load and move mode
No
1402 Punch
Yes
Punch 80 Ripple Cards
No
1402 Reader
Yes
Read cards from 1402 Punch routine
No
1442 Reader
Yes
Read cards from 1402 Punch Routine
No
1403 Printer
Yes
Print 80 Ripple Lines of Alpha or Numeric Char.
No
729/ 7330 Tapes
Yes
Test all Unit Ctls and WR - BSP - RD - CMP Fields
No
Files
Yes
Test 1301
Yes
Wr. Format, Wr. HA0, Wr. HA2, Wr. Track, WDC, Rd. Track, Cmp Data, Move & Load Modes
No
Test 1311
Yes
No
Any Unit Avail.
Yes
No
Store Available Units
3
Seek to Cyl 3 Wr. Track, WDC, Rd. Track, Head Switching, Scan Feature, Seek Overlap Feature

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1002                CTL    3
1003                LOAD
1004                LINES  36
1005      ********************************************************
1006      ********************************************************
1007      * THE SYSTEM AND THE 4 CHANNEL CONTROL CARDS MUST     *
1008      * BE PUNCHED WITH THE CONFIGURATION OF THIS           *
1009      * SYSTEM BEFORE RUNNING THIS PROGRAM                  *
1010      ********************************************************
1011      ********************************************************
1012                ORG    1000                                             01000
1013      *STANDARD  TADS.
1014      ********************************************************
1015      *                              NOT 1                  1
1016      TAD0      DC     @ @     TYPE OUTPUT          BYPASS ALL TYPING    1  01000
1017      TAD1      DC     @ @     NO LOOPS             LOOP ROUTINE         1  01001
1018      TAD2      DC     @ @     NO ERROR HALTS       HALT ON ERROR        1  01002
1019      TAD3      DC     @ @     SINGLE PROGRAM PASS  REPEAT PROGRAM       1  01003
1020      ********************************************************
1021      * SPECIAL TADS                                         *
1022      ********************************************************
1023      TAD4      DC     @ @     UNOVERLAP            BYPASS UNOVERLAP     1  01004
1024      TAD5      DC     @ @     OVERLAP              BYPASS OVERLAP       1  01005
1025                DCW    @M@                                               1  01006
                                  G
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1027      **********************************************************
1028      *PROGRAM ALTER ROUTINE                                           *
1029                ORG    10C7                                                01007
1030      **********************************************************
1031      ITR       SBR    ITREXT&5          STORE BAR FOR RETURN           7  01007  G 01074 B
1032      ITR1      RCP    ITR2&4            ENTER LOC TO BE ALTERED       10  01014  M %TO 01049 R
1033                BEX1   ITR1,M            WLR AND NO TRANSFER            7  01024  R 01014 M
1034                BNT1   TELL                                             7  01031  R 01076 B
1035                BA1    ITR2              RESET I/O INTERLOCK            7  01038  R 01045 M
1036      ITR2      RCPW   0                                                10  01045  L %TO 00000 R
1037                BEX1   ITR2,M            RETURN TO REQUEST ON ANY BUT WLR 7  01055  R 01045 M
1038                BA1    *&1               BRANCH ANY                     7  01062  R 01069 M
1039      ITREXT    B      0                 RETURN TO PROGRAM              7  01069  J 00000
1040      TELL      SW     TELL1                                            6  01076  , 01090
1041                B      ITREXT                                           7  01082  J 01069
1042                H                                                       1  01089  .
1043      TELL1     DC     @ @               WM HERE TELE-P INQUIRY         1  01090
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1045      **********************************************************
1046      NEX1      EQU    40C              EQUATE LOAD PROGRAM TO ADDR 400
1047      BL1       EQU    17600
1048      BLENC     EQU    17731
1049      TREAC     EQU    17400
1050      TPEND     EQU    17531
1051      CATA      EQU    17200
1052      CEND      EQU    17331
1053      WORK      EQU    17C00
1054      WEND      EQU    17131
1055      READIN    EQU    17800
1056      REND      EQU    17879
1057      **********************************************************
1058      *STANDARC TYPE RCUTINE 1.                                 *
1059      **********************************************************
1060      TYP1      SBR    TYP2&5           STORE MESSAGE ADDRESS             7  01091  G 01110 B
1061                SBR    TYP3&8           DITTO                             7  01098  G 01144 B
1062      TYP2      SCNRG  0,C              FIND RETURN ADDDRESS             12  01105  D 00000 00000 Q
1063                SAR    TYP4&5           SET RETURN ADDRESS                7  01117  G 01165 A
1064                BCE    TYP4,TADO,1      BRANCH-BYPASS OUTPUT PER XTAD 0  12  01124  B 01160 01000 1
1065      TYP3      WCP    0                TYPE MESSAGE                     10  01136  M &TO 00000 W
1066                BCBI   TYP3             BRANCH ON BUSY                    7  01146  R 01136 2
1067                BAI    *&1              RESET INTERLOCK                   7  01153  R 01160 M
1068      TYP4      B      0                RETURN TO PROGRAM                 7  01160  J 00000
1069                H                                                        1  01167  .
1070      F1301AD   DCW    F1301                                             5  01172  10297
1071      CADD      DCW    19999                                             5  01177
1072      FORAC     DCW    17C63                                             5  01182
1073       ONES     DCW    111111111111                                     12  01183
1074       TWOS     DCW    222222222222                                     12  01195
1075       THREES   DCW    333333333333                                     12  01207
1076       FOURS    DCW    444444444444                                     12  01219
```

```
PGLIN     LABEL      OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1078      ********************************************************
1079      *      DEFINE CONTROL CARDS                                  *
1080      ********************************************************
1081                 ORG    1242                                           01242
1082                 DCW    @0+11VN/9@                                  8  01249
1083      *TEST NUMBER AND SUFFIX
1084      ********************************************************
1085                 ORG    1250                                           01250
1086       NUMBR     DCW    @ST01@                                      4  01250
1087      SUFFIX     DC     @B@,G                                       1  01254
```

```
PGLIN    LABEL      OPCOD  OPERAND                                                CT  ADDRS  INSTRUCTION

 1089    *******************************************************
 1090    *******************************************************
 1091    * THE SYSTEM AND THE 4 CHANNEL CONTROL CARDS MUST     *
 1092    * BE PUNCHED WITH THE CONFIGURATION OF THIS           *
 1093    * SYSTEM BEFORE RUNNING THIS PROGRAM                  *
 1094    *******************************************************
 1095    *******************************************************
 1096    *$STANDARD SYSTEM CONTROL CARD.                       *
 1097    *******************************************************
 1098               ORG    1256     CHARACTER & PURPOSE         COL                01256
 1099    SYS1       DC     @ @  ALPHA O,I,X - 1410,1410ACC,7010 13            1  01256
 1100            &1 DC     @ @  0,1,3,5,7,9-10,20,40,60,80,100K 14            1  01257
 1101            &2 DC     @ @              SPARE               15            1  01258
 1102            &3 DC     @ @  1,2-CHNL1 100,132 CHAR PRINTER  16            1  01259
 1103            &4 DC     @ @  1,2-CHNL2 100,132 CHAR PRINTER  17            1  01260
 1104            &5 DC     @ @  1 BIT--EUROPEAN EDIT            18            1  01261
 1105    *                      2-BIT--50 CYCLE POWER
 1106            &6 DC     @ @              SPARE               19            1  01262
 1107            &7 DC     @ @  1 - OVERLAP                     20            1  01263
 1108            &8 DC     @ @  1 - PRIORITY ALERT              21            1  01264
 1109           &11 DC     @   @            SPARES           22-24            3  01267
 1110           &12 DC     @ @  1 - CHANNEL ONE PRESENT         25            1  01268
 1111           &13 DC     @ @  1 - CHANNEL TWO PRESENT         26            1  01269
 1112           &14 DC     @ @  1 - CHANNEL THREE PRESENT       27            1  01270
 1113           &15 DC     @ @  1 - CHANNEL FOUR PRESENT        28            1  01271
 1114           &17 DC     @  @             SPARES           29-30            2  01273
 1115           &18 DC     @ @  1 - 1401 COMPATIBILITY          31            1  01274
 1116           &19 DC     @ @  1 - TIMER INTERRUPT             32            1  01275
 1117           &20 DC     @ @  1 - PROGRAM ADDRESSABLE CLOCK   33            1  01276
 1118           &21 DC     @ @  1 - RELOCATE AND PROTECT        34            1  01277
 1119           &22 DC     @ @  1 - FLOATING POINT ARITHMETIC   35            1  01278
 1120           &31 DC     @         @      SPARES           36-44            9  01287
 1121           &32 DC     @‡@                                  45            1  01288
```

```
PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1123      ************************************************************
1124      *$STANDARD CHANNEL 1 CONTROL CARD.                            *
1125      ************************************************************
1126                 ORG    1289      CHARACTER & PURPOSE          COL          01289
1127      CHN1       DC     @ @  1 - PAPER TAPE READER             13     1  01289
1128              &1 DC     @ @  1 - CONSOLE PRINTER               14     1  01290
1129              &2 DC     @ @  1 - TAPES 729/7330                15     1  01291
1130             &11 DC     @      @          SPARES              16-24    9  01300
1131             &12 DC     @ @  R,S,C - 1402,1442,7223 READER     25     1  01301
1132             &13 DC     @ @  B - READER COLUMN BINARY FEAT.    26     1  01302
1133             &14 DC     @ @  P - 1402 PUNCH                    27     1  01303
1134             &15 DC     @ @  B - PUNCH COLUMN BINARY FEAT.     28     1  01304
1135             &16 DC     @ @  P - 1403 PRINTER                  29     1  01305
1136             &17 DC     @ @  A,N - ALPHA,NUMERIC PRINT CHAIN   30     1  01306
1137             &18 DC     @ @  1,2 - 100,132 CHAR PRINT BUFFER   31     1  01307
1138             &19 DC     @ @  F - 1301 FILE                     32     1  01308
1139             &20 DC     @ @  1 THRU 0 - 1 THRU 10 FILE MODULE  33     1  01309
1140             &21 DC     @ @  1 THRU 0 - 1 THRU 10 ACCESSES     34     1  01310
1141             &22 DC     @ @  R - 1311 IMPAC                    35     1  01311
1142             &23 DC     @ @  1 THRU 5 - 1 THRU 5 IMPAC MODULE  36     1  01312
1143             &24 DC     @ @  1 - SEEK OVERLAP FEATURE          37     1  01313
1144             &25 DC     @ @  1 - SCAN FEATURE                  38     1  01314
1145             &26 DC     @ @  1 - TRACK RECORD FEATURE          39     1  01315
```

PGLIN	LABEL		OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1147		&27	DC	@ @	F - 1405 FILE 40	1	01316	
1148		&28	DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 0 41	1	01317	
1149		&29	DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 1 42	1	01318	
1150		&30	DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 2 43	1	01319	
1151		&31	DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 3 44	1	01320	
1152		&32	DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 4 45	1	01321	
1153		&33	DC	@ @	1 - 775C ON THIS CHANNEL 46	1	01322	
1154		&34	DC	@ @	1 - 774C ON THIS CHANNEL 47	1	01323	
1155		&35	DC	@ @	1 - 1440/1460 ON THIS CHANNEL 48	1	01324	
1156		&36	DC	@ @	1 - CHAN HAS CHANNEL EXTENDER 49	1	01325	
1157		&37	DC	@ @	L - LOW SPEED HYPER TAPE 50	1	01326	
1158		&38	DC	@ @	1,2,3-1050-1,2,OR BOTH ADAPTERS 51	1	01327	
1159		&39	DC	@ @	1-BIT-1412-MAGNETIC INK CHAR RDR52	1	01328	
1160	*				2-BIT-1419-MAGNETIC INK CHAR RDR			
1161		&40	DC	@ @	1-BIT-1009-DATA TRANS UNIT 53	1	01329	
1162		&41	DC	@ @	1-BIT-1014-REMOTE INQUIRY 54	1	01330	
1163		&42	DC	@ @	1-BIT-TELEGRAPH 55	1	01331	
1164		&43	DC	@ @	F - 1302 FILES 56	1	01332	
1165		&44	DC	@ @	RESERVED 57	1	01333	
1166		&55	DC	@	@ 58-68	11	01344	
1167		&56	DC	@*@	69	1	01345	

```
PGLIN     LABEL       OPCOD  OPERAND                                              CT  ADDRS  INSTRUCTION

1169      *****************************************************
1170      *$STANDARD CHANNEL 2 CONTROL CARD.                  *
1171      *****************************************************
1172                  ORG    1346     CHARACTER & PURPOSE         COL                01346
1173      CHN2        DC     @ @  1 - PAPER TAPE READER            13             1  01346
1174             &1   DC     @ @  1 - CONSOLE PRINTER              14             1  01347
1175             &2   DC     @ @  1 - TAPES 729/7330               15             1  01348
1176            &11   DC     @         @        SPARES          16-24             9  01357
1177            &12   DC     @ @  R,S,C - 1402,1442,7223 READER    25             1  01358
1178            &13   DC     @ @  B - READER COLUMN BINARY FEAT.   26             1  01359
1179            &14   DC     @ @  P - 1402 PUNCH                   27             1  01360
1180            &15   DC     @ @  B - PUNCH COLUMN BINARY FEAT.    28             1  01361
1181            &16   DC     @ @  P - 1403 PRINTER                 29             1  01362
1182            &17   DC     @ @  A,N - ALPHA,NUMERIC PRINT CHAIN 30             1  01363
1183            &18   DC     @ @  1,2 - 100,132 CHAR PRINT BUFFER 31             1  01364
1184            &19   DC     @ @  F - 1301 FILE                    32             1  01365
1185            &20   DC     @ @  1 THRU 0 - 1 THRU 10 FILE MODULE33             1  01366
1186            &21   DC     @ @  1 THRU 0 - 1 THRU 10 ACCESSES   34             1  01367
1187            &22   DC     @ @  R - 1311 IMPAC                   35             1  01368
1188            &23   DC     @ @  1 THRU 5 - 1 THRU 5 IMPAC MODULE36             1  01369
1189            &24   DC     @ @  1 - SEEK OVERLAP FEATURE         37             1  01370
1190            &25   DC     @ @  1 - SCAN FEATURE                 38             1  01371
1191            &26   DC     @ @  1 - TRACK RECORD FEATURE         39             1  01372
```

PGLIN	LABEL		OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1193		&27	DC	@ @ F - 1405 FILE	40	1	01373	
1194		&28	DC	@ @ 1,2,3 - 1,2,3 ARMS IN MODULE 0	41	1	01374	
1195		&29	DC	@ @ 1,2,3 - 1,2,3 ARMS IN MODULE 1	42	1	01375	
1196		&30	DC	@ @ 1,2,3 - 1,2,3 ARMS IN MODULE 2	43	1	01376	
1197		&31	DC	@ @ 1,2,3 - 1,2,3 ARMS IN MODULE 3	44	1	01377	
1198		&32	DC	@ @ 1,2,3 - 1,2,3 ARMS IN MODULE 4	45	1	01378	
1199		&33	DC	@ @ 1 - 7750 ON THIS CHANNEL	46	1	01379	
1200		&34	DC	@ @ 1 - 7740 ON THIS CHANNEL	47	1	01380	
1201		&35	DC	@ @ 1 - 1440/1460 ON THIS CHANNEL	48	1	01381	
1202		&36	DC	@ @ 1 - CHAN HAS CHANNEL EXTENDER	49	1	01382	
1203		&37	DC	@ @ L - LOW SPEED HYPER TAPE	50	1	01383	
1204		&38	DC	@ @ 1,2,3-1050-1,2,OR BOTH ADAPTERS	51	1	01384	
1205		&39	DC	@ @ 1-BIT-1412-MAGNETIC INK CHAR RDR	52	1	01385	
1206	*			2-BIT-1419-MAGNETIC INK CHAR RDR				
1207		&40	DC	@ @ 1-BIT-1009-DATA TRANS UNIT	53	1	01386	
1208		&41	DC	@ @ 1-BIT-1014-REMOTE INQUIRY	54	1	01387	
1209		&42	DC	@ @ 1-BIT-TELEGRAPH	55	1	01388	
1210		&43	DC	@ @ F - 1302 FILES	56	1	01389	
1211		&44	DC	@ @ RESERVED	57	1	01390	
1212		&55	DC	@ @	58-68	11	01401	
1213		&56	DC	@+@	69	1	01402	

```
PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1215      **********************************************************
1216      *$STANDARD CHANNEL 3 CONTROL CARD.                        *
1217      **********************************************************
1218                 ORG    14C3      CHARACTER & PURPOSE            COL      01403
1219      CHN3       DC     @ @  1 - PAPER TAPE READER               13     1 01403
1220            &1   DC     @ @  1 - CONSOLE PRINTER                 14     1 01404
1221            &2   DC     @ @  1 - TAPES 729/7330                  15     1 01405
1222           &11   DC     @      @        SPARES                  16-24  9 01414
1223           &12   DC     @ @  R,S,C - 1402,1442,7223 READER       25     1 01415
1224           &13   DC     @ @  B - READER COLUMN BINARY FEAT.      26     1 01416
1225           &14   DC     @ @  P - 1402 PUNCH                      27     1 01417
1226           &15   DC     @ @  B - PUNCH COLUMN BINARY FEAT.       28     1 01418
1227           &16   DC     @ @  P - 1403 PRINTER                    29     1 01419
1228           &17   DC     @ @  A,N - ALPHA,NUMERIC PRINT CHAIN     30     1 01420
1229           &18   DC     @ @  1,2 - 100,132 CHAR PRINT BUFFER     31     1 01421
1230           &19   DC     @ @  F - 1301 FILE                       32     1 01422
1231           &20   DC     @ @  1 THRU C - 1 THRU 10 FILE MODULE    33     1 01423
1232           &21   DC     @ @  1 THRU C - 1 THRU 10 ACCESSES       34     1 01424
1233           &22   DC     @ @  R - 1311 IMPAC                      35     1 01425
1234           &23   DC     @ @  1 THRU 5 - 1 THRU 5 IMPAC MODULE    36     1 01426
1235           &24   DC     @ @  1 - SEEK OVERLAP FEATURE            37     1 01427
1236           &25   DC     @ @  1 - SCAN FEATURE                    38     1 01428
1237           &26   DC     @ @  1 - TRACK RECORD FEATURE            39     1 01429
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1239		&27 DC	@ @	F - 1405 FILE 40	1	01430	
1240		&28 DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 0 41	1	01431	
1241		&29 DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 1 42	1	01432	
1242		&30 DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 2 43	1	01433	
1243		&31 DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 3 44	1	01434	
1244		&32 DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 4 45	1	01435	
1245		&33 DC	@ @	1 - 775C ON THIS CHANNEL 46	1	01436	
1246		&34 DC	@ @	1 - 774C ON THIS CHANNEL 47	1	01437	
1247		&35 DC	@ @	1 - 144C/1460 ON THIS CHANNEL 48	1	01438	
1248		&36 DC	@ @	1 - CHAN HAS CHANNEL EXTENDER 49	1	01439	
1249		&37 DC	@ @	L - LOW SPEED HYPER TAPE 50	1	01440	
1250		&38 DC	@ @	1,2,3-1C50-1,2,OR BOTH ADAPTERS 51	1	01441	
1251		&39 DC	@ @	1-BIT-1412-MAGNETIC INK CHAR RDR52	1	01442	
1252	*			2-BIT-1419-MAGNETIC INK CHAR RDR			
1253		&40 DC	@ @	1-BIT-1C09-DATA TRANS UNIT 53	1	01443	
1254		&41 DC	@ @	1-BIT-1C14-REMOTE INQUIRY 54	1	01444	
1255		&42 DC	@ @	1-BIT-TELEGRAPH 55	1	01445	
1256		&43 DC	@ @	F - 1302 FILES 56	1	01446	
1257		&44 DC	@ @	RESERVED 57	1	01447	
1258		&55 DC	@	@ 58-68	11	01458	
1259		&56 DC	@+@	69	1	01459	

```
PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1261      **********************************************************
1262      *$STANDARD CHANNEL 4 CONTROL CARD.                          *
1263      **********************************************************
1264                 ORG    1460      CHARACTER & PURPOSE          COL          01460
1265      CHN4       DC     @ @  1 - PAPER TAPE READER              13      1  01460
1266               &1 DC     @ @  1 - CONSOLE PRINTER                14      1  01461
1267               &2 DC     @ @  1 - TAPES 729/7330                 15      1  01462
1268              &11 DC     @      @          SPARES              16-24      9  01471
1269              &12 DC     @ @  R,S,C - 1402,1442,7223 READER      25      1  01472
1270              &13 DC     @ @  B - READER COLUMN BINARY FEAT.     26      1  01473
1271              &14 DC     @ @  P - 1402 PUNCH                     27      1  01474
1272              &15 DC     @ @  B - PUNCH COLUMN BINARY FEAT.      28      1  01475
1273              &16 DC     @ @  P - 1403 PRINTER                   29      1  01476
1274              &17 DC     @ @  A,N - ALPHA,NUMERIC PRINT CHAIN    30      1  01477
1275              &18 DC     @ @  1,2 - 100,132 CHAR PRINT BUFFER    31      1  01478
1276              &19 DC     @ @  F - 1301 FILE                      32      1  01479
1277              &20 DC     @ @  1 THRU 0 - 1 THRU 10 FILE MODULE   33      1  01480
1278              &21 DC     @ @  1 THRU 0 - 1 THRU 10 ACCESSES      34      1  01481
1279              &22 DC     @ @  R - 1311 IMPAC                     35      1  01482
1280              &23 DC     @ @  1 THRU 5 - 1 THRU 5 IMPAC MODULE   36      1  01483
1281              &24 DC     @ @  1 - SEEK OVERLAP FEATURE           37      1  01484
1282              &25 DC     @ @  1 - SCAN FEATURE                   38      1  01485
1283              &26 DC     @ @  1 - TRACK RECORD FEATURE           39      1  01486
```

PGLIN	LABEL		OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1285		&27	DC	@ @	F - 1405 FILE 40	1	01487	
1286		&28	DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 0 41	1	01488	
1287		&29	DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 1 42	1	01489	
1288		&30	DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 2 43	1	01490	
1289		&31	DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 3 44	1	01491	
1290		&32	DC	@ @	1,2,3 - 1,2,3 ARMS IN MODULE 4 45	1	01492	
1291		&33	DC	@ @	1 - 7750 ON THIS CHANNEL 46	1	01493	
1292		&34	DC	@ @	1 - 7740 ON THIS CHANNEL 47	1	01494	
1293		&35	DC	@ @	1 - 1440/1460 ON THIS CHANNEL 48	1	01495	
1294		&36	DC	@ @	1 - CHAN HAS CHANNEL EXTENDER 49	1	01496	
1295		&37	DC	@ @	1 - LOW SPEED HYPER TAPE 50	1	01497	
1296		&38	DC	@ @	1,2,3-1050-1,2,OR BOTH ADAPTERS 51	1	01498	
1297		&39	DC	@ @	1-BIT-1412-MAGNETIC INK CHAR RDR52	1	01499	
1298	*				2-BIT-1419-MAGNETIC INK CHAR RDR			
1299		&40	DC	@ @	1-BIT-1009-DATA TRANS UNIT 53	1	01500	
1300		&41	DC	@ @	1-BIT-1014-REMOTE INQUIRY 54	1	01501	
1301		&42	DC	@ @	1-BIT-TELEGRAPH 55	1	01502	
1302		&43	DC	@ @	F - 1302 FILES 56	1	01503	
1303		&44	DC	@ @	RESERVED 57	1	01504	
1304		&55	DC	@	@ 58-68	11	01515	
1305		&56	DC	@+@	69	1	01516	

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1307      **********************************************************
1308      *       CHANNEL ALTER ROUTINE                            *
1309      **********************************************************
1310                ORG    1517                                        01517
1311      CHSTT     SBR    CHSTTR&5                                  7 01517  G 01960 B
1312                MLNA   STARAD,SCAN&10                           12 01524  D 01966 01569 /
1313                SW     X1-4                                      6 01536  , 00025
1314                S      X1                                        6 01542  S 00029
1315                A      ONES,X1                                  11 01548  A 01183 00029
1316      SCAN      SCNLB  19999,0                                  12 01559  D 19999 00000 -
1317                SBR    ADDHLD                                    7 01571  G 01976 B
1318                A      ONES,ADDHLD                              11 01578  A 01183 01976
1319                C      ADDHLD,STOPAD                            11 01589  C 01976 01971
1320                BE     CHSTTR                                    7 01600  J 01955 S
1321                MLNA   ADDHLD,*&6                               12 01607  D 01976 01624 /
1322                MLCS   0,*&12                                   12 01619  D 00000 01642 3
1323                BCE    CHINS,K1,7                               12 01631  B 01690 01988 7
1324                BCE                                              1 01643  B
1325                BCE                                              1 01644  B
1326                BCE    STINS                                     6 01645  B 01775
1327                BCE                                              1 01651  B
1328                BCE                                              1 01652  B
1329                BCE                                              1 01653  B
1330                BCE    OLINS                                     6 01654  B 01806
1331      UPDATE    S      ONES,ADDHLD                              11 01660  S 01183 01976
1332                MLNA   ADDHLD,SCAN&10                           12 01671  D 01976 01569 /
1333                B      SCAN                                      7 01683  J 01559
1334      CHINS     MLNA   ADDHLD,*&11                             12 01690  D 01976 01712 /
1335                MLCS   CHCODE,0&X1                              12 01702  D 01977 000#0 3
1336                NOP                                              1 01714  N
1337      TOUSW     B      UPDATE                                    7 01715  J 01660
```

PCLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1339		A	THREES,ADDHLD	11	01722	A 01207 01976
1340		MLNA	ADDHLD,*&11	12	01733	D 01976 01755 /
1341		MLCS	TPIBL&X2,0	12	01745	D 164J7 00000 3
1342		S	THREES,ADDHLD	11	01757	S 01207 01976
1343		B	UPDATE	7	01768	J 01660
1344	STINS	MLNA	ADDHLD,*&11	12	01775	D 01976 01797 /
1345		MLCS	CHSTAT,0	12	01787	D 01978 00000 3
1346		B	UPDATE	7	01799	J 01660
1347	CLINS	A	SIX,ADDHLD	11	01806	A 01980 01976
1348		MLNA	ADDHLD,*&6	12	01817	D 01976 01834 /
1349		MLCS	0,*&12	12	01829	D 00000 01852 3
1350		BCE	SETOL,K2,1	12	01841	B 01863 01992 1
1351		BCE		1	01853	B
1352		BCE		1	01854	B
1353		BCE		1	01855	B
1354		B	REDUCE	7	01856	J 01937
1355	SETOL	MLNA	ADDHLD,*&11	12	01863	D 01976 01885 /
1356		MLCS	BOLOM,0	12	01875	D 01979 00000 3
1357	IMP	NOP		1	01887	N
1358		B	REDUCE	7	01888	J 01937
1359		S	SIX,ADDHLD	11	01895	S 01980 01976
1360		MLNA	ADDHLD,*&11	12	01906	D 01976 01928 /
1361		MLCWS	NNNN,0	12	01918	D 01993 00000 7
1362		B	UPDATE	7	01930	J 01660
1363	REDUCE	S	SIX,ADDHLD	11	01937	S 01980 01976
1364		B	UPDATE	7	01948	J 01660
1365	CHSTTR	B	0	7	01955	J 00000
1366	STARAD	DCW	00000	5	01966	
1367	STOPAD	DCW	00000	5	01971	
1368	ADDHLD	DCW	00000	5	01976	
1369	CHCODE		0	1	01977	
1370	CHSTAT		0	1	01978	
1371	BOLOM		1	1	01979	
1372	SIX		6	1	01980	
1373	K1	DCW	@J13XRULM@	8	01988	
1374	K2		@4321@	4	01992	

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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1375      NNNN      DCW    @N@                                       1  01993
1376      **********************************************************
1377                ORG    02000                                        02000
1378      * 7010  SYSTEM TEST - ST01A                              *
1379      **********************************************************
1380                BAI    *&1                                       7  02000  R 02007 G M
1381                CS     99                                        6  02007  / 00099
1382                SW     X6-4                                      6  02013  , 00050
1383                BNQ    ITR                                       7  02019  J 01007 Q
1384                MRCWG  JAY,1              MOVE J FOR RETURN     12  02026  D 16440 00001 D L
1385                MLNS   SYS1&1,MEMSZ-4     MEMORY SIZE           12  02038  D 01257 16681 1
1386                MLNA   MEMSZ,CWCWM                              12  02050  D 16685 16690 /
1387                A      ONES,CWOWM         STEP FOR CMP-EOM      11  02062  A 01183 16690
1388                MLCS   TEST1,MODESV                            12  02073  D 15920 16503 3
1389                NOP                                             1  02085  N
1390      SWITCH    B      INIT                                      7  02086  J 18000
1391      **********************************************************
1392      MTYPE     BCE    MODE,SYS1&7,1      OVERLAP AVAILABLE     12  02093  B 02134 01263 1
1393                CW     IMP&1,IMP1&1                             11  02105  ¤ 01888 19561
1394                CW     IMP2&1                                    6  02116  ¤ 19617
1395                MLCS   ONES,TAD5          FORCE BYPASS OF OVERLAP 12  02122  D 01183 01005 3
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1397      **********************************************************
1398      *     DETERMINE MODE FOR TESTING                         *
1399      **********************************************************
1400      MODE      BCE    *&8,TAD4,1          BYPASS UNOVERLAP MODE  12  02134  B 02153 01004 1
1401                B      ULAP                DO UNOVERLAP MODE      7  02146  J 02355
1402                BCF    *&8,TAD5,1          BYPASS OVERLAP MODE    12  02153  B 02172 01005 1
1403                B      OLAP                DO OVERLAP MODE        7  02165  J 15531
1404                BCE    NOMODE,MODESV,      T/O IF NO MODE SET     12  02172  B 02277 16503
1405                BW     INQX,TELL1          TELE-P INQUIRY         12  02184  V 02203 01090 1
1406                B      GO                                         7  02196  J 02225
1407      INQX      B      TYP1                                       7  02203  J 01091
1408                DCW    @TELE-PROC. INQ@,G                        14  02223
1409      GO        BCE    DOAGN,TAD0,1                              12  02225  B 02258 01000 1
1410      PREND     B      TYP1                                       7  02237  J 01091
1411                DCW    @STO1 COMPLETE@,G                         13  02256
1412      DOAGN     BCE    MODE,TAD3,1         REPEAT PROGRAM         12  02258  B 02134 01003 1
1413                B      NEX1                NEXT PROGRAM           7  02270  J 00400
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1415      NOMODE    B      TYP1                                        7  02277  J 01091
1416                DCW    @NC MODE SET-INQ-STORE ST01 SPECIAL TADS@,G 39  02322
1417                RCP    TAD4                                       10  02324  M &TO 01004 R
1418                BEX1   *-16,SM             ANY BUT WLR             7  02334  R 02324 SMG
1419                BA1    *&1                                         7  02341  R 02348 M
1420                B      MODE                                        7  02348  J 02134
1421      ************************************************************
1422      *          UNOVERLAP MODE ALL CHANNELS,ALL RDY UNITS       *
1423      ************************************************************
1424      ULAP      SBR    EXIT&5                                      7  02355  G 02475 B
1425                MLCS   ZEROS,OLSW          TURN OFF OVERLAP SWT   12  02362  D 16768 16896 3
1426                MLCS   MFV,CREG1           NO OP                  12  02374  D 16706 07365 3
1427      CTEST     MLNS   ONES,MODESV         SHOW THAT MODE WAS SET 12  02386  D 01183 16503 1
1428                MLCS   TEST1,CHANSV                               12  02398  D 15920 16505 3
1429                BCE    ONE,SYS1&12,1       CHAN 1 AVAILABLE       12  02410  B 02543 01268 1
1430                BCE    TWO,SYS1&13,1       CHAN 2 AVAILABLE       12  02422  B 15138 01269 1
1431                BCE    THREE,SYS1&14,1     CHAN 3 AVAILABLE       12  02434  B 15273 01270 1
1432                BCE    FOUR,SYS1&15,1      CHAN 4 AVAILABLE       12  02446  B 15408 01271 1
1433                BCE    NOCHAN,CHANSV,      BR IF NO CHAN SET      12  02458  B 02477 16505
1434      EXIT      B      0                                           7  02470  J 00000
1435      NOCHAN    B      TYP1                                        7  02477  J 01091
1436                DCW    @NC CHNL SET-INQ-STORE CHNLS@,G            27  02510
1437                RCP    SYS1&12                                    10  02512  M &TO 01268 R
1438                BEX1   *-16,SM                                     7  02522  R 02512 SMG
1439                BA1    *&1                                         7  02529  R 02536 M
1440                B      CTEST                                       7  02536  J 02386
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1442      ********************************************************
1443      *      SET UP FOR CHANNEL 1 OPERATION                  *
1444      ********************************************************
1445      CONE      SBR    E1&5                                               7  02543  G 02914 B
1446                MLCS   CH1,CHCODE          % TO CHAN ALTER ROUTINE       12  02550  D 16453 01977 3
1447                MLCA   MODE4,CHNTS&36      MOVE MODE TO T/O              12  02562  D 16564 02723 T
1448                MLNS   ONES,CHANSV                                       12  02574  D 01183 16505 1
1449                MLNS   ONES,CHNTS&13       MOVE CHAN TO TEST TO T/O      12  02586  D 01183 02700 1
1450                MLCS   CH1S,CHSTAT         R TO CHAN ALTER ROUTINE       12  02598  D 16469 01978 3
1451                MLNA   SC1,STARAD          MOVE SCAN START ADDR          12  02610  D 16477 01966 /
1452                MLNA   SC1A,STOPAD         MOVE SCAN STOP ADDR           12  02622  D 16482 01971 /
1453                MLCS   ONES,BOLOM                                        12  02634  D 01183 01979 3
1454                B      CHSTT               BR TO ALTER CHAN ROUTINE       7  02646  J 01517
1455                S      X6                                                 6  02653  S 00054
1456                B      TUL1                                               7  02659  J 02673
1457                B      TS1                                                7  02666  J 02739
1458      TUL1      SBR    TY1&5                                              7  02673  G 02737 B
1459                B      TYP1                                               7  02680  J 01091
1460      CHNTS     DCW    @TESTING CHAN-                    @,G             37  02687
1461                BNQ    ITR                                                7  02725  J 01007 Q
1462      TY1       B      0                                                  7  02732  J 00000
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1464    ****************************************************
1465    *        CHECK UNITS TO BE TESTED                  *
1466    ****************************************************
1467    TS1      MLCS   TEST1,UNITSV                                     12  02739  D 15920 16506 3
1468             NCP                                                      1  02751  N
1469             BCE    TYWR,CHN1&1,1        TEST CONSOLE PRINTER        12  02752  B 19500 01290 1
1470             CW     *-17                                              6  02764  ¤ 02752
1471             B      CLEAR                                             7  02770  J 09854
1472             BCE    PUNCH,CHN1&14&X6,P  TEST PUNCH                   12  02777  B 02916 01T.3 P
1473             BCE    READA,CHN1&12&X6,R  TEST 1402 RDR                12  02789  B 03428 01T.1 R
1474             BCE    READB,CHN1&12&X6,S  TEST 1442 RDR                12  02801  B 03454 01T.1 S
1475             BCE    PRINT,CHN1&16&X6,P  TEST 1403 PRINTER            12  02813  B 04123 01T.5 P
1476             BCE    TAPE,CHN1&2&X6,1    TEST TAPES                   12  02825  B 05415 01SR1 1
1477             B      FILE                                              7  02837  J 09722
1478             BCE    *&8,UNITSV,          NO UNIT SET                 12  02844  B 02863 16506
1479             B      E1                   OK                           7  02856  J 02909
1480             MLCS   CHNTS&13,NCUT&25     CHAN NO. TO T/O             12  02863  D 02700 02907 3
1481             B      TYP1                                              7  02875  J 01091
1482     NCUT    DCW    @NC UNITS SET OR RDY CHAN 1@,G                   26  02882
1483    E1       B      0                                                 7  02909  J 00000
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1485      **********************************************************
1486      *          PUNCH TEST                                    *
1487      **********************************************************
1488      PUNCH     SBR    E5&5                                              7  02916  G 03340 B
1489                MLNA   PNC1,6            PUNCH ROUTINE ADDR TO RESTART  12  02923  D 16575 00006 /
1490      PNC       BAI    *&1               TURN OFF INTERLOCK             7  02935  R 02942 M
1491                MLNS   ONES,UNITSV                                      12  02942  D 01183 16506 1
1492                S      PUCTR             RESET COUNTER TO ZERO          6  02954  S 16335
1493                S      X5                RESET X5                       6  02960  S 00049
1494                B      CLEAR                                            7  02966  J 09854
1495                SW     DATA                                             6  02973  , 17200
1496                MLCWA  WMGM,WORK&80                                     12  02979  D 16192 17080 X
1497                MLCWA  WMGM,DATA&80                                     12  02991  D 16192 17280 X
1498                MLNWA  SEVEN9,X5         79 TO X5                       12  03003  D 16779 00049 V
1499                MLCWA  WMGM,BL1&132                                     12  03015  D 16192 17732 X
1500                MLCA   FIELD&X5,DATA&X5                                 12  03027  D 16TT6 17S#0 T
1501                MLCA   DATA&X5,WORK&X5                                 12  03039  D 17S#0 17##0 T
1502      PU1       P      0,WORK            PUNCH NORMAL                   10  03051  M %40 17000 W
1503                BOL1   OIP1                                             7  03061  J 05067 1
1504                BCB1   PU1                                              7  03068  R 03051 2
1505                BAI    PUERR                                            7  03075  R 03342 M
1506                B      OLTST                                            7  03082  J 05211
1507                BNQ    ITR                                              7  03089  J 01007 Q
1508      RIP       B      RIPPLE                                           7  03096  J 15015
1509                A      ONES,PUCTR                                      11  03103  A 01183 16335
1510                C      EIGHTY,PUCTR      CMP CTR TO 00080              11  03114  C 16512 16335
1511                BE     PUBLK             80 RIPPLE CDS PUNCHED NORMALLY 7  03125  J 03139 S
1512                B      PU1                                              7  03132  J 03051
1513      PUBLK     BNQ    ITR                                              7  03139  J 01007 Q
1514                BCE    RIP,TAD1,1        REPEAT ROUTINE                 12  03146  B 03096 01001 1
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1516                P      4,BL1&52          BLANK IN 4             10  03158  M %44 17652 W
1517                BCL1   OIP1                                      7  03168  J 05067 1
1518                BCB1   *-23                                      7  03175  R 03158 2G
1519                BA1    PUERR             ERROR                  7  03182  R 03342 M
1520                B      OLTST                                     7  03189  J 05211
1521                P      8,BL1&52          BLANK IN 8             10  03196  M %48 17652 W
1522                BCL1   OIP1              BR IF OVERLAP          7  03206  J 05067 1
1523                BCB1   *-23                                      7  03213  R 03196 2G
1524                BA1    PUERR             ERROR                  7  03220  R 03342 M
1525                B      OLTST             BR TO TEST OVERLAP     7  03227  J 05211
1526                P      8,BL1&52                                 10  03234  M %48 17652 W
1527                BCB1   *-16                                      7  03244  R 03234 2G
1528                BA1    PUERR                                     7  03251  R 03342 M
1529                BNQ    ITR                                       7  03258  J 01007 Q
1530                BCE    E5,CHN1&12&X6,    RDR NOT TSTED          12  03265  B 03335 01T.1
1531                B      TYP1                                      7  03277  J 01091
1532                DCW    @ CDS FROM NORMAL PUNCH POCKET TO RDR@   36  03319
1533                DC     @-EOF ON-START@,G                        13  03332
1534                H                                                1  03334  .
1535      E5        B      0                                         7  03335  J 00000
1536      *********************************************************
1537      *      PUNCH ERROR ROUTINE                              *
1538      *********************************************************
1539      PUERR     SBR    E6&5                                      7  03342  G 03426 B
1540                BNQ    ITR                                       7  03349  J 01007 Q
1541                B      TIN01             BR TO TEST INDICATORS  7  03356  J 04927
1542                MLCA   WKA1,PER1&12      MOVE INDICATORS        12  03363  D 16774 03394 T
1543      WRIT2     B      TYP1                                      7  03375  J 01091
1544       PER1     DCW    @PUNCH -------@,G  1 2 4 8 B A           13  03382
1545                BCE    E5,PER1&7,1       NOT RDY GO TO NEXT UNIT 12  03396  B 03335 03389 1
1546      PUHLT1    BCE    *&2,TAD2,         BYPASS ERROR HALT      12  03408  B 03421 01002
1547      PUHLT     H                                                1  03420  .
1548      E6        B      0                                         7  03421  J 00000
```

```
PGLIN   LABEL    OPCOD  OPERAND                                                   CT  ADDRS  INSTRUCTION

1550    ************************************************************
1551    *     1402 READER TEST                                     *
1552    ************************************************************
1553    READA    SBR    E865                                                       7  03428  G 03766 B
1554             MLCA   RDR1,PER2&4          1402 TO T/O                          12  03435  D 16918 03812 T
1555             B      STT                                                        7  03447  J 03473
1556    READB    SBR    E865                                                       7  03454  G 03766 B
1557             MLCA   RDR2,PER2&4          1442 TO T/O                          12  03461  D 16922 03812 T
1558    STT      S      EOFCNT                                                     6  03473  S 16897
1559             SW     RDCNE&19                                                   6  03479  , 03749
1560             MLNA   REA1,6               READER ROUTINE ADDR TO RESTART       12  03485  D 16570 00006 /
1561             B      CLEAR                                                      7  03497  J 09854
                                                                                                       G
1562    REA      BA1    *&1                  TURN OFF INTERLOCK                    7  03504  R 03511 M
1563             SW     DATA                                                       6  03511  , 17200
1564             MLNS   ONES,UNITSV                                               12  03517  D 01183 16506 1
1565             MLCWA  WMGM,DATA&80                                              12  03529  D 16192 17280 X
1566             MLCWA  WMGM,WORK&80                                              12  03541  D 16192 17080 X
1567             MLCWS  WMGM,READIN&80                                            12  03553  D 16192 17880 7
1568             MLNWA  SEVEN9,X5            79 TO X5                             12  03565  D 16779 00049 V
1569             MLCA   FIELD&X5,DATA&X5                                          12  03577  D 16TT6 17S*0 T
1570             MLCA   DATA&X5,WORK&X5                                           12  03589  D 17S*0 17**0 T
1571    RA       CS     REND                 CLEAR RD AREA                         6  03601  / 17879
1572             SW     READIN                                                     6  03607  , 17800
1573    R1       R      0,READIN             READ AND STACK NORMAL READ           10  03613  M %10 17800 R
1574             BOL1   OIP1                                                       7  03623  J 05067 1
1575             BCB1   R1                                                         7  03630  R 03613 2
1576             BEF1   RDCNE                                                      7  03637  R 03730 8
1577             CW     RDONE&19                                                   6  03644  ¤ 03749
                                                                                                       G
1578             BA1    RERR                 ERROR                                 7  03650  R 03768 M
1579             B      OLTST                                                      7  03657  J 05211
1580             SW     WORK                                                       6  03664  , 17000
1581             C      REND,WORK&X5         CMP RIPPLE TO CD READ                11  03670  C 17879 17**0
1582             BE     RIPPLE                                                     7  03681  J 15015 S
1583             BU     *&8                                                        7  03688  J 03702 /
1584             B      RA                                                         7  03695  J 03601
```

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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1586                BNQ    ITR                                       7  03702  J 01007 Q
1587                B      CMPER              CMP ERROR              7  03709  J 03858
1588                B      RIPPLE                                    7  03716  J 15015
1589                B      RA                                        7  03723  J 03601
1590      RDCNE     BA1    *&1                                       7  03730  R 03737 GM
1591                A      ONES,EOFCNT                              11  03737  A 01183 16897
1592                NOPWM                                            1  03748  N
1593                BCF    RA,EOFCNT,1                              12  03749  B 03601 16897 1
1594      E8        B      0                  NEXT UNIT              7  03761  J 00000
1595      **********************************************************
1596      *     READER ERROR ROUTINE                                 *
1597      **********************************************************
1598      RERR      SBR    E7&5                                      7  03768  G 03856 B
1599                BNQ    ITR                                       7  03775  J 01007 Q
1600                B      TIND1              BR TO TEST INDICATORS  7  03782  J 04927
1601                MLCA   WKA1,PER2&16       MOVE INDICATORS       12  03789  D 16774 03824 T
1602      WRIT3     B      TYP1                                      7  03801  J 01091
1603       PER2     DCW    @ 1402 RDR -------@,G  1 2 4 8 B A       17  03808
1604                BCE    E8,PER2&11,1                             12  03826  B 03761 03819 1
1605      RHLT      BCE    *&2,TAD2,          BYPASS ERROR HALT     12  03838  B 03851 01002
1606      RHLT1     H                         HLT CHANNEL ERROR      1  03850  .
1607      E7        B      0                  NEXT UNIT              7  03851  J 00000
```

```
PGLIN    LABEL     OPCOD  OPERAND                                         CT  ADDRS  INSTRUCTION

1609     ***************************************************
1610     *     READER COMPARE ERROR                         *
1611     ***************************************************
1612     CMPER     SBR    E965                                             7  03858  G 04121 B
1613               BNQ    ITR                                              7  03865  J 01007 Q
1614               BCE    RHLT2,TAD0,1         BYPASS PRINTING            12  03872  B 04096 01000 1
1615               MLCA   REND,T1&85           READ AREA TO T/O           12  03884  D 17879 03988 T
1616               B      TYP1                 TO PRINT                    7  03896  J 01091
1617      T1       DCW    @CC IS-@                                         6  03903
1618               DC     @                      @                        20  03928
1619               DC     @                      @                        20  03948
1620               DC     @                      @                        20  03968
1621               DC     @                      @,G                      20  03988
1622               MLCA   WORK&X5,T2&85        MOVE  RIPPLE TO T/O        12  03990  D 17‡‡0 04094 T
1623               B      TYP1                                             7  04002  J 01091
1624      T2       DCW    @CC SB-@                                         6  04009
1625               DC     @                      @                        20  04034
1626               DC     @                      @                        20  04054
1627               DC     @                      @                        20  04074
1628               DC     @                      @,G                      20  04094
1629     RHLT2     BCE    RHLT3,TAD2,1         HLT ON ERROR               12  04096  B 04115 01002 1
1630               B      E9                                               7  04108  J 04116
1631     RHLT3     H                                                       1  04115  .
1632     E9        B      0                                                7  04116  J 00000
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1634    ********************************************************
1635    *          14C3  PRINTER TEST                                  *
1636    ********************************************************
1637    PRINT    SBR    E3&5                                              7  04123  G 04825 B
1638             MLNA   CHAIN1,6          PRINT ROUTINE ADDR TO RESTART   12  04130  D 16580 00006 /
1639    CHAIN    BAI    *&1               TURN OFF INTERLOCK              7  04142  R 04149 GM
1640             MLNS   ONES,UNITSV                                       12  04149  D 01183 16506 1
1641             B      CLEAR                                             7  04161  J 09854
1642             SW     DATA                                              6  04168  , 17200
1643             MLCWS  WMGM,WORK&132                                     12  04174  D 16192 17132 7
1644             MLCWS  WMGM,DATA&132                                     12  04186  D 16192 17332 7
1645    ACHAIN   BCE    ALPH1,CHN1&17&X6,A  ALPHA CHAIN                  12  04198  B 04303 01T.6 A
1646    NCHAIN   BCE    NUM1,CHN1&17&X6,N   NUMERIC CHAIN                12  04210  B 04655 01T.6 N
1647             B      TYP1                                              7  04222  J 01091
1648             DCW    @CHAIN TYPE NOT SET-INQ-STORE A-ALPHA N-NUM@,G   42  04270
1649    RCTYP1   RCP    CHN1&17&X6                                        10  04272  M %TO 01T.6 R
1650             BEX1   *-16,M                                           7  04282  R 04272 SM
1651             BAI    *&1                                               7  04289  R 04296 GM
1652             B      ACHAIN                                            7  04296  J 04198
1653    ********************************************************
1654    *          CHECK BUFFER SIZE                                   *
1655    ********************************************************
1656    ALPH1    BCE    PRTA,CHN1&18&X6,1  100 CHAR BUFFER               12  04303  B 04401 01T.7 1
1657    ALPH11   BCE    PRTB,CHN1&18&X6,2  132 CHAR BUFFER               12  04315  B 04600 01T.7 2
1658    BNCTST   B      TYP1                                              7  04327  J 01091
1659             DCW    @ BUFF SIZE NOT SET-INQ-STORE 1 OR 2@,G          35  04368
1660    RBUF     RCP    CHN1&18&X6                                        10  04370  M %TO 01T.7 R
1661             BEX1   *-16,M             ANY BUT WLR                     7  04380  R 04370 SM
1662             BAI    *&1                                               7  04387  R 04394 GM
1663             B      CHAIN                                             7  04394  J 04142
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1665	PRTA	S	X5	ZERO X5	6	04401	S 00049
1666		S	PCTR	RESET COUNTER TO ZERO	6	04407	S 16197
1667		MLNWA	NINTY9,X5	99	12	04413	D 16789 00049 V
1668		MLCWA	WMGM,WORK&100		12	04425	D 16192 17100 X
1669		MLCWA	WMGM,DATA&100		12	04437	D 16192 17300 X
1670		MLCA	ALPHAP&X5,DATA&X5	100 CHAR	12	04449	D 16‡V8 17S‡0 T
1671		MLCA	DATA&X5,WORK&X5		12	04461	D 17S‡0 17‡‡0 T
1672		BNQ	ITR		7	04473	J 01007 Q
1673	PRNT	W	WORK	PRINT A LINE	10	04480	M &20 17000 W
1674		BCL1	OIP1		7	04490	J 05067 1
1675		BCB1	PRNT		7	04497	R 04480 2 G
1676		BA1	PERR		7	04504	R 04827 M
1677		B	OLTST		7	04511	J 05211
1678		A	ONES,PCTR		11	04518	A 01183 16197
1679		C	EIGHTY,PCTR	80 LINES	11	04529	C 16512 16197
1680		BE	CTAD	END OF PRINTING	7	04540	J 04561 S
1681		B	RIPPLE		7	04547	J 15015
1682		B	PRNT		7	04554	J 04480
1683	CTAD	BNQ	ITR		7	04561	J 01007 Q
1684		BCE	*&8,TAD1,1	REPEAT ROUTINE	12	04568	B 04587 01001 1
1685		B	E3	DO NOT REPEAT	7	04580	J 04820
1686		S	PCTR		6	04587	S 16197
1687		B	PRNT		7	04593	J 04480

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PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1689    ****************************************************
1690    PRTB     S      X5                   ZERO X5                      6  04600  S 00049
1691             S      PCTR                 ZERO CTR                     6  04606  S 16197
1692             MLNWA  ONE31,X5             131                         12  04612  D 16784 00049 V
1693             MLCA   ALPHAP&X5,DATA&X5    132 CHAR                    12  04624  D 16*V8 17S*0 T
1694             MLCA   DATA&X5,WORK&X5      132 CHAR                    12  04636  D 17S*0 17**0 T
1695             B      PRNT                                              7  04648  J 04480
1696    ****************************************************
1697    *           NUMERIC CHAIN   CHECK BUFFER SIZE             *
1698    ****************************************************
1699    NUM1     BCE    PRTC,CHN1&18&X6,1    100 CHAR BUFFER             12  04655  B 04686 01T.7 1
1700    NUM11    BCE    PRTD,CHN1&18&X6,2    132 CHAR BUFFER             12  04667  B 04765 01T.7 2
1701             B      BNCTST               BUFFER SIZE NOT SET          7  04679  J 04327
1702    ****************************************************
1703    PRTC     S      PCTR                 RESET COUNTER TO ZERO        6  04686  S 16197
1704             S      X5                                                6  04692  S 00049
1705             MLCWA  WMGM,WORK&100                                    12  04698  D 16192 17100 X
1706             MLCWA  WMGM,DATA&100                                    12  04710  D 16192 17300 X
1707             MLNWA  NINTY9,X5            99                          12  04722  D 16789 00049 V
1708             MLCA   NUMERP&X5,DATA&X5                                12  04734  D 16/Z8 17S*0 T
1709             MLCA   DATA&X5,WORK&X5                                  12  04746  D 17S*0 17**0 T
1710             B      PRNT                 NUMERIC CHAIN 100 CHARS      7  04758  J 04480
1711    ****************************************************
1712    PRTD     S      X5                                                6  04765  S 00049
1713             S      PCTR                 RESET COUNTER TO ZERO        6  04771  S 16197
1714             MLNWA  ONE31,X5             131 TO X5                   12  04777  D 16784 00049 V
1715             MLCA   NUMERP&X5,DATA&X5                                12  04789  D 16/Z8 17S*0 T
1716             MLCA   DATA&X5,WORK&X5                                  12  04801  D 17S*0 17**0 T
1717             B      PRNT                                              7  04813  J 04480
1718    C3       B      0                    CHECK FOR NEXT UNIT          7  04820  J 00000
```

```
PGLIN   LABEL    OPCOD  OPERAND                                         CT  ADURS  INSTRUCTION

1720    ************************************************************
1721    *        PRINTER ERROR ROUTINE                              *
1722    ************************************************************
1723    PERR     SBR    E465                                            7  04827  G 04925 B
1724             BNQ    ITR                                             7  04834  J 01007 Q
1725             BCE    PTHLT,TACO,1       BYPASS PRINTING             12  04841  B 04907 01000 1
1726             B      TIND1               BR TO TEST INDICATORS       7  04853  J 04927
1727             MLCA   WKA1,PEROR&14       MOVE INDICATORS            12  04860  D 16774 04893 T
1728    WRIT1    B      TYP1                                            7  04872  J 01091
1729     PERCR   CCW    @PRINTER --------@,G  1 2 3 4 B A              15  04879
1730             BCE    E3,PEROR&9,1        DO NEXT UNIT IF NOT RDY    12  04895  B 04820 04888 1
1731    PTHLT    BCE    *&2,TAD2,          BYPASS HALT ON ERROR        12  04907  B 04920 01002
1732    PHLT     H                                                      1  04919  .
1733    E4       B      0                  RETURN                       7  04920  J 00000
```

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PCLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1735      ********************************************************
1736      *     TEST INDICATORS ROUTINE                              *
1737      ********************************************************
1738      TIND1     SBR    TINDIR&5            STORE BAR FOR RETURN    7  04927  G 05065 B
1739                MLCA   INDMES,WKA1         MOVE INDICATOR MESSAGE TO WK AREA  12  04934  D 16757 16774 T
1740                BNR1   *&13                                        7  04946  R 04965 1
1741                MLCS   TEST1,WKA1-5        SUBTRACT NOT READY  1  12  04953  D 15920 16769 3
1742                BCB1   *&13                                        7  04965  R 04984 2
1743                MLCS   TEST1,WKA1-4        SUBTRACT BUSY  2       12  04972  D 15920 16770 3
1744                BER1   *&13                                        7  04984  R 05003 4
1745                MLCS   TEST1,WKA1-3        SUBTRACT DATA CHECK 4  12  04991  D 15920 16771 3
1746                BEF1   *&13                                        7  05003  R 05022 8
1747                MLCS   TEST1,WKA1-2        SUBTRACT CONDITION  8  12  05010  D 15920 16772 3
1748                BWL1   *&13                                        7  05022  R 05041 -
1749                MLCS   TEST1,WKA1-1        SUBTRACT WRONG LENGTH  B  12  05029  D 15920 16773 3
1750                BNT1   *&13                                        7  05041  R 05060 S B
1751                MLCS   TEST1,WKA1          SUBTRACT NO TRANSFER  A  12  05048  D 15920 16774 3
1752      TINDIR    B      0                   RETURN TO PROGRAM  *   7  05060  J 00000
1753      ********************************************************
1754      *     OVERLAP IN PROCESS ROUTINE                           *
1755      ********************************************************
1756      OIP1      SBR    OIPIR&5             STORE BAR FOR RETURN    7  05067  G 05209 B
1757                BCE    *&8,SYS1,X         7010                    12  05074  B 05093 01256 X
1758                B      BOLOK               BYPASS 7010 INSTR.      7  05086  J 05174
1759                DCW    @$@                 STORE CPU STATUS        1  05093
1760                DC     00012               SHOULD NOT BRING        5  05098
1761                DC     @S@                 UP COMPUTE DISABLE      1  05099
1762                DCW    @$@                 RESTORE CPU STATUS      1  05100
1763                DC     00012               SHOULD NOT BRING        5  05105
1764                DC     @R@                 UP COMPUTE DISABLE      1  05106
1765                BCL1   BOLOK                                       7  05107  J 05174 1
1766                B      TYP1                                        7  05114  J 01091
1767                DCW    @CPU STORE/RESTORE CAUSES COMPUTE DISABLE@,  40  05160
1768                BCE    *&2,TAD2,           BYPASS ERROR HLT       12  05161  B 05174 01002
1769                H                                                  1  05173  .
```

```
PGLIN    LABEL    OPCOD  OPERAND                                                     CT  ADDRS  INSTRUCTION

1771     BOLOK    SW     CIPSW               SET SW-OVERLAP IN PROC                  6  05174  , 16763
1772              S      ACCUM               RESET ACCUMULATOR TO ZERO               6  05180  S 16762
1773              A      ONES,ACCUM          ADD ONE TO ACCUMULATOR                 11  05186  A 01183 16762
1774              BCL1   *-17                BR IF OVERLAP IN PROCESS                7  05197  J 05186 1
1775     CIPIR    B      0                   RETURN TO PROGRAM                       7  05204  J 00000
1776     **************************************************
1777     *     SEE IF OVERLAP OPERATICN    ROUTINE           *
1778     **************************************************
1779     CLTST    SBR    OLTSTR&5            STORE BAR FOR RETURN                    7  05211  G 05296 B
1780              BW     YESOL,OIPSW         BR IF OPER. WAS OVERLAPPED             12  05218  V 05298 16763 1
1781              BCE    OLTSTR,OLSW,0       BR IF OPER. NOT OVERLAPPED             12  05230  B 05291 16896 0
1782              BCE    OLFLT,TADO,1        BR IF BYPASS PRINT ERRORS              12  05242  B 05278 01000 1
1783              B      TYP1                                                        7  05254  J 01091
1784              DCW    @ FAIL TO BR OLAP@,G                                       16  05276
1785     OLHLT    BCE    *&2,TAD2,           BR IF BYPASS ERROR HALT                12  05278  B 05291 01002
1786              H                          ERROR HALT                              1  05290  .
1787     CLTSTR   B      0                   RETURN TO PROGRAM                       7  05291  J 00000
1788     **************************************************
1789     *     YES OPERATION WAS OVERLAPPED                  *
1790     **************************************************
1791     YESOL    CW     OIPSW               TURN OVERLAP IN PROCESS SW. OFF         6  05298  ¤ 16763
1792              BCE    OLTSTR,OLSW,1       BR IF SHOULD BE OVERLAP                12  05304  B 05291 16896 1
1793              C      ACCUM,ZERO          SEE IF COMPUTE TIME WAS AVAIL.         11  05316  C 16762 16507
1794              BE     OLPERR              BR IF NOT                               7  05327  J 05377 S
1795              BCE    OLFLT,TADO,1                                               12  05334  B 05278 01000 1
1796              B      TYP1                                                        7  05346  J 01091
1797              DCW    @BRANCHED OVERLAP@,G                                       16  05368
1798              B      OLFLT                                                       7  05370  J 05278
1799     CLPERR   B      TYP1                                                        7  05377  J 01091
1800              DCW    @ OLAP COMPUTE TIME IS 0@,G                                23  05406
1801              B      OLFLT                                                       7  05408  J 05278
```

```
PGLIN    LABEL     OPCOD  OPERAND                                            CT  ADDRS  INSTRUCTION

1803     ****************************************************
1804     *         TAPE TEST                                *
1805     ****************************************************
1806     TAPE      SBR    TX&5                                                7  05415  G 05672 B
1807               B      CLEAR                                               7  05422  J 09854
1808               MLCWS  WMCM,TREAD&132                                     12  05429  D 16192 17532 7
1809               MLNA   REST,6           TAPE ROUTINE ADDR TO RESTART      12  05441  D 16517 00006 /
1810               CW     SW99                                                6  05453  ¤ 05503
                                                                                              G
1811     RESET1    BA1    *&1              TURN OFF INTERLOCK                 7  05459  R 05466 M
1812               MLNS   ONES,UNITSV                                        12  05466  D 01183 16506 1
1813               MLNA   TPADR,TTBL&10    RESET INITIAL TBL ADDR            12  05478  D 16452 05569 /
1814     TPRET     MLNA   TPADR,FRDY1&10   RESET TABLE ADDRESS               12  05490  D 16452 05765 /
1815               NCPWM                                                      1  05502  N
1816     SW99      B      TPEX                                                7  05503  J 05743
1817               MLNS   ONES,RWD&3       RESET TP ADDR TO 1                12  05510  D 01183 05543 1
1818               SW     BL1                                                 6  05522  , 17600
1819               MLCA   BL1&21,TPTBL&21  CLEAR TP TBL                      12  05528  D 17621 16438 T
1820     RWC       RWD    11                                                  5  05540  U %U1 R
1821               BCB1   *-11                                                7  05545  R 05540 2
                                                                                              G
1822               BA1    UPCT                                                7  05552  R 05606 M
1823     TTBL      MLNS   RWD&3,TPTBL      MOVE RDY TP ADDR TO TBL           12  05559  D 05543 16417 1
1824               BCE    RDY,RWD&3,9      REWIND COMPLETE                   12  05571  B 05674 05543 9
1825               SW     TTBL&6                                              6  05583  , 05565
1826               A      TWCS,TTBL&10     STEP TBL ADDR & 2                 11  05589  A 01195 05569
1827               CW     TTBL&6                                              6  05600  ¤ 05565
1828     UPCT      BCE    RDY,RWD&3,9      SEE IF LAST TP                    12  05606  B 05674 05543 9
1829               BNQ    ITR                                                 7  05618  J 01007 Q
1830               SW     RWD&3                                               6  05625  , 05543
1831               A      ONES,RWD&3       STEP TP ADDR 1                    11  05631  A 01183 05543
1832               CW     RWD&3                                               6  05642  ¤ 05543
1833               B      RWC                                                 7  05648  J 05540
```

```
LABEL     OPCOD  OPERAND                                               CT  ADDRS  INSTRUCTION

REPT      BCE    TPRET,TAC1,1          REPEAT ALL TAPE ROUTINES        12  05655  B 05490 01001 1
TX        B      0                     EXIT                             7  05667  J 00000
*
                                                                                                D
RDY       MRCWG  TPTBL,MESS&15                                         12  05674  D 16417 05720 L
          MLNS   CHNTS&13,MESS&5                                       12  05686  D 02700 05710 1
          B      TYP1                                                   7  05698  J 01091
 MESS     DCW    @CHAN   TPS RDY-                     @,G              37  05705
*****************************************************
*        FIND RDY TAPE FROM TABLE                    *
*****************************************************
TPEX      SW     SW99                                                   6  05743  , 05503
FRDY      S      X2                    SET X2 0                         6  05749  S 00034
FRDY1     BCE    REPT,TPTBL&X2,        LAST TP-CHECK FOR REPEAT        12  05755  B 05655 164J7
          MLNS   TPTBL&X2,USETP&4      TP ADDR TO T/O                  12  05767  D 164J7 05790 1
          B      TYP1                                                   7  05779  J 01091
 USETP    DCW    @ TC- @,G                                              5  05786
```

```
PCLIN     LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1852      ********************************************************
1853      *     CHECK WTM-BSP-RD TM-CHECK FOR EXPECTED EOF     @
1854      ********************************************************@
1855                MLNA   BL1ADD,STOPAD               12  05792  D 16487 01971 /
1856                MLNA   UPCTAD,STARAD               12  05804  D 16492 01966 /
1857                CW     TDUSW                        6  05816  ¤ 01715
1858                B      CHSTT                        7  05822  J 01517
1859                SW     TDUSW,BL1                   11  05829  , 01715 17600
1860                MLNA   SC1,STARAD                  12  05840  D 16477 01966 /
1861                MLNA   SC1A,STOPAD                 12  05852  D 16482 01971 /
1862      BL1A      SW     WTM&5          SET BAR       6  05864  , 05889
1863                SBR    OPERT&5                      7  05870  G 14338 B
1864                DCW    @J@                          1  05877
1865                DC     WTM            TURN OFF TI   5  05882  05884
1866                DC     @K@                          1  05883
1867      WTM       WTM    11             TAPE MARK     5  05884  U %U1 M
1868                BCL1   CIP1                         7  05889  J 05067 1
1869                BCB1   WTM                          7  05896  R 05884 2
1870                BA1    TERR                         7  05903  R 14288 G M
1871                B      OLTST                        7  05910  J 05211
1872      BSPX      BSP    11             BSP OVER TM   5  05917  U %U1 B
1873                BCB1   *-11                         7  05922  R 05917 2
1874                BA1    TERR                         7  05929  R 14288 G M
```

```
PGLIN   LABEL   OPCOD  OPERAND                                      CT  ADDRS  INSTRUCTION

1876            SW     RT&10           SET BAR                       6  05936  , 05959
1877            SBR    OPERT&5                                       7  05942  G 14338 B
1878    RT      RT     11,TREAD&131    OVER TM  EVEN PARITY         10  05949  M %U1 17531 R
1879            BCL1   OIP1                                          7  05959  J 05067 1
1880            BCB1   RT                                            7  05966  R 05949 2
1881    BEF     BEF1   *&15            TM INDICATION                 7  05973  R 05994 8
                                                                                         G
1882            BA1    *&1                                           7  05980  R 05987 M
1883            B      EOFERR          EOF NOT ON- ERROR             7  05987  J 14545
                                                                                         G
1884            BA1    *&1                                           7  05994  R 06001 M
1885            B      OLTST                                         7  06001  J 05211
1886            BNQ    ITR                                           7  06008  J 01007 Q
1887            DCW    @J@                                           1  06015
1888            DC     BOC                                           5  06020  06022
1889            DC     @K@                                           1  06021
1890    BOO     BCE    BL1A,TAD1,1     REPEAT THIS ROUTINE          12  06022  B 05864 01001 1
```

```
                       1410/7010--20K--SYSTEM TEST
PGLIN  LABEL    OPCOD  OPERAND                                                  CT  ADDRS  INSTRUCTION

1892   ***************************************************
1893   *     WRITE TAPE MARK                             *
1894   *     BSP OVER TM THEN TRY TO RD TM ODD PARITY    *
1895   *     DATA CHK AND EOF EXPECTED                   *
1896   ***************************************************                       5  06034  U %U1 B
1897   BL2      BSP    11                                                        7  06039  R 06034 2
                                                                                                   G
1898            BCB1   *-11                                                      7  06046  R 14288 M
1899            BA1    TERR                                                      6  06053  , 06071
1900            SW     WTMXX&5                                                   7  06059  G 14338 B
1901            SBR    OPERT&5                                                   5  06066  U %U1 M
1902   WTMXX    WTM    11                                                        7  06071  R 06066 2
                                                                                                   G
1903            BCB1   *-11                                                      7  06078  R 14288 M
1904            BA1    TERR                                                      5  06085  U %U1 B
1905            BSP    11                                                        7  06090  R 06085 2
                                                                                                   G
1906            BCB1   *-11                                                      7  06097  R 14288 M
1907            BA1    TERR                                                      6  06104  , 06127
1908            SW     RTB&10           SET BAR                                  7  06110  G 14338 B
1909            SBR    OPERT&5                                                  10  06117  M %B1 17531 R
1910   RTB      RTB    11,TREAD&131     TRY TO RD TM IN ODD PARITY               7  06127  J 05067 1
1911            BOL1   OIP1                                                      7  06134  R 06117 2
1912            BCB1   RTB                                                       7  06141  R 06162 4
                                                                                                   G
1913            BER1   *&15             DATA CHK OK                              7  06148  R 06155 M
1914            BA1    *&1                                                       7  06155  J 14607
1915            B      RTMODD           NO DATA CHK                              7  06162  R 06183 8
                                                                                                   G
1916            BEF1   *&15             EOF OK                                   7  06169  R 06176 M
1917            BA1    *&1                                                       7  06176  J 14703
                                                                                                   G
1918            B      RTMOD1           NO EOF                                   7  06183  R 06190 M
1919            BA1    *&1                                                       7  06190  J 05211
1920            B      OLIST                                                     7  06197  J 01007 Q
1921            BNQ    ITR                                                      12  06204  B 06066 01001 1
1922            BCE    WTMXX,TAD1,1     REPEAT ROUTINE                           1  06216
1923            DCW    @J@                                                       5  06221  06223
1924            DC     BP1                                                       1  06222
1925            DC     @K@
```

```
LABEL    OPCOD  OPERAND                                        CT  ADDRS  INSTRUCTION

*****************************************************
*     CHECK THAT BSP OVER ONE RECORD WORKS CORRECTLY *
*****************************************************
BP1      BSP    11                                              5  06223  U %U1 B
         BCB1   *-11                                            7  06228  R 06223 2G
         BA1    TERR                                            7  06235  R 14288 M
         SW     WTMZX&5          SET BAR                        6  06242  , 06260
         SBR    OPERT&5                                         7  06248  G 14338 B
WTMZX    WTM    11               WR TAPE MARK                   5  06255  U %U1 M
         BCL1   OIP1                                            7  06260  J 05067 1
         BCB1   *-18                                            7  06267  R 06255 2G
         BA1    TERR                                            7  06274  R 14288 M
         B      OLTST                                           7  06281  J 05211
         SW     WTA&10           SET BAR                        6  06288  , 06311
         SBR    OPERT&5                                         7  06294  G 14338 B
WTA      WT     11,TTYPE1&54     0123456789                    10  06301  M %U1 15909 W
         BCL1   OIP1                                            7  06311  J 05067 1
         BCB1   WTA                                             7  06318  R 06301 2G
         BA1    TERR                                            7  06325  R 14288 M
         B      OLTST                                           7  06332  J 05211
BSPAA    BSP    11               ONCE                           5  06339  U %U1 B
         BCB1   BSPAA                                           7  06344  R 06339 2G
         BA1    TERR                                            7  06351  R 14288 M
         SW     RTAA&10          SET BAR                        6  06358  , 06381
         SBR    OPERT&5                                         7  06364  G 14338 B
RTAA     RT     11,TREAD&122     SHOULD BE 0123456789          10  06371  M %U1 17522 R
         BCL1   OIP1                                            7  06381  J 05067 1
         BCB1   RTAA                                            7  06388  R 06371 2
         BEF1   BSFAIL           ERROR                          7  06395  R 06509 8G
TAA      BA1    *&1                                             7  06402  R 06409 M
```

```
PGLIN   LABEL    OPCOD OPERAND                                  CT ADDRS  INSTRUCTION

1958             B     OLTST                                     7 06409  J 05211
1959             CW    TTYPE1&54,TTYPE1&59                      11 06416  ¤ 15909 15914
1960             SW    TREAD&122                                 6 06427  , 17522
1961             C     TTYPE1&63,TREAD&131                      11 06433  C 15918 17531
1962             CW    TREAD&122                                 6 06444  ¤ 17522
1963             BE    COK                                       7 06450  J 06476 S
1964             B     TYP1                                      7 06457  J 01091
1965             DCW   @DID NOT BSP@,G                          11 06474
1966    COK      BNQ   ITR                                       7 06476  J 01007 Q
1967             BCE   BP1,TAD1,1            REPT ROUT          12 06483  B 06223 01001 1
1968             DCW   @J@                                       1 06495
1969             DC    BBY                                       5 06500  06502
1970             DC    @K@                                       1 06501
1971    BBY      B     ROUTA                                     7 06502  J 06568
1972    BSFAIL   B     TYP1                                      7 06509  J 01091
1973    BSFL     DCW   @BSP OVER 2 RECORDS INSTEAD OF 1@,G      31 06546
1974             BCE   *&2,TAD2,             BYPASS HLT         12 06548  B 06561 01002
1975             H                                               1 06560  .
1976             B     COK                                       7 06561  J 06476
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1978      **************************************************
1979      * CHECK WR EVEN PARITY-MOVE MODE AND RD MOVE EVEN    *
1980      * THEN ALTER TO CHECK MOVE MODE ODD PARITY           *
1981      * THEN ALTER TO CHECK LOAD MODE ODD PARITY           *
1982      * THEN ALTER TO CHECK LOAD MODE EVEN PARITY          *
1983      **************************************************
1984      ROUTA     CW     MODD&1,LODDD&1                           11  06568  ¤ 06794 06839
1985                CW     LODEV&1                                   6  06579  ¤ 06884
1986                MLCS   ALPHAP&12,WT      MOVE -  M              12  06585  D 16070 06641 3
1987                MLCS   ALPHAP&12,RT1     MOVE -  M              12  06597  D 16070 06723 3
1988      BL3Z      BSP    11                                        5  06609  U %U1 B
1989                BCB1   *-11                                      7  06614  R 06609 2
1990                BAL    TERR                                      7  06621  R 14288 GM
1991                SW     WT&10             SET BAR                 6  06628  , 06651
1992                SBR    OPERT&5                                   7  06634  G 14338 B
1993      WT        WT     11,WTAPEO         WR 132 CHARS           10  06641  M %U1 15922 W
1994                BCL1   DIP1                                      7  06651  J 05067 1
1995                BCB1   WT                                        7  06658  R 06641 2
1996                BAL    TERR                                      7  06665  R 14288 GM
1997                B      OLTST                                     7  06672  J 05211
1998      BSPX3     BSP    11                                        5  06679  U %U1 B
1999                BCB1   *-11                                      7  06684  R 06679 2
2000                BAL    TERR                                      7  06691  R 14288 GM
2001                SW     RT1&10            SET BAR                 6  06698  , 06733
2002                SBR    OPERT&5                                   7  06704  G 14338 B
2003                MLCWA  BLEND,TPEND       MOVE BLANKS TO RD FLD  12  06711  D 17731 17531 X
2004      RT1       RT     11,TREAD                                 10  06723  M %U1 17400 R
2005                BCL1   DIP1                                      7  06733  J 05067 1
2006                BCB1   RT1                                       7  06740  R 06723 2
2007                BAL    TERR                                      7  06747  R 14288 GM
2008                B      OLTST                                     7  06754  J 05211
2009                C      WTAPEO&131,TPEND  CMP RD FLD TO WR FLD   11  06761  C 16053 17531
2010                BE     *&8                                       7  06772  J 06786 S
2011                B      FLDER                                     7  06779  J 14835
```

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PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
2013                B      INC                               7  06786  J 06928
2014      MOCD      NOPWM                  SET UP FOR MOVE ODD  1  06793  N
2015                B      LOCOD                             7  06794  J 06838
2016                MLCS   WTAPE0&3,WT&2   MOVE - B          12  06801  D 15925 06643 3
2017                MLCS   WTAPE0&3,RT1&2  MOVE - B          12  06813  D 15925 06725 3
2018                SW     MOCOD&1                           6  06325  , 06794
2019                B      BL3Z                              7  06831  J 06609
2020      LOCOC     NOPWM                  SET UP FOR LOAD ODD  1  06838  N
2021                B      LOCEV                             7  06839  J 06883
2022                MLCS   ALPHAP&11,WT    MOVE - L         12  06846  D 16069 06641 3
2023                MLCS   ALPHAP&11,RT1   MOVE - L         12  06858  D 16069 06723 3
2024                SW     LOCOD&1                           6  06870  , 06839
2025                B      BL3Z                              7  06876  J 06609
2026      LOCEV     NOPWM                  SET UP FOR LOAD EVEN  1  06883  N
2027                B      INCA                              7  06884  J 06961
2028                MLCS   ALPHAP&20,WT&2  MOVE - U         12  06891  D 16078 06643 3
2029                MLCS   ALPHAP&20,RT1&2 MOVE - U         12  06903  D 16078 06725 3
2030                SW     LOCEV&1                           6  06915  , 06884
2031                B      BL3Z                              7  06921  J 06609
2032      INC       SBR    INCEX&5                           7  06928  G 06959 B
2033                BNQ    ITR                               7  06935  J 01007 Q
2034                BCE    BL3Z,TAD1,1     REPEAT MODE JUST TSTED  12  06942  B 06609 01001 1
2035      INCEX     B      0                                 7  06954  J 00000
2036      INCA      BNQ    ITR                               7  06961  J 01007 Q
2037                BCE    ROUTA,TAD1,1    REPT ALL 4 MODES  12  06968  B 06568 01001 1
```

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PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2039      ********************************************************
2040      * WR MOVE EVEN 132 CHAR-RD MOVE EVEN STOP ON WM/GM    *
2041      ********************************************************
2042      FLDOK     BSP    11                                                5  06980  U %U1 B
2043                BCB1   *-11                                              7  06985  R 06980 2
2044                BAI    TERR                                              7  06992  R 14288 GM
2045                SW     WT1&10              SET BAR                       6  06999  , 07022
2046                SBR    OPERT&5                                           7  07005  G 14338 B
2047      WT1       WT     11,WTAPEO           WR 132 CHAR MOVE MOVE EVEN   10  07012  M %U1 15922 W
2048                BOL1   OIP1                                             7  07022  J 05067 1
2049                BCB1   WT1                                              7  07029  R 07012 2
2050                BAI    TERR                                              7  07036  R 14288 GM
2051                B      OLTST                                             7  07043  J 05211
2052      BSPX5     BSP    11                                                5  07050  U %U1 B
2053                BCB1   *-11                                              7  07055  R 07050 2
2054                BAI    TERR                                              7  07062  R 14288 GM
2055                SW     RT2&10              SET BAR                       6  07069  , 07116
2056                SBR    OPERT&5                                           7  07075  G 14338 B
2057                MLCWA  BLEND,TPEND         MOVE BLANKS TO RD FLD        12  07082  D 17731 17531 X
2058                MLCWS  TREAD&132,TREAD&100  SET WM/GM FOR 100 CHAR FLD   12  07094  D 17532 17500 7
2059      RT2       RT     11,TREAD            RD TP MOVE MODE EVEN STOP WM/GM 10 07106  M %U1 17400 R
2060                BOL1   OIP1                                             7  07116  J 05067 1
2061                BCB1   RT2                                              7  07123  R 07106 2
2062                BWL1   *&15                WLR EXPECTED                  7  07130  R 07151 -
2063                BAI    *&1                                               7  07137  R 07144 GM
2064                B      WLR                 NO WLR-ERROR-                 7  07144  J 14769
2065                BCE    RDO,TREAD&100,M     GM                           12  07151  B 07213 17500 GM
2066                B      TYP1                                              7  07163  J 01091
2067                DCW    @ WM/GM LOST DURING RD-STOP ON WM/GM IN MEM@,G   42  07211
2068      RDO       B      OLTST                                             7  07213  J 05211
2069                BAI    *&1                                               7  07220  R 07227 GM
2070                C      WTAPEO&99,TREAD&99                               11  07227  C 16021 17499
2071                BE     *&8                                               7  07238  J 07252 S
2072                B      FLDER               CMP ERROR                     7  07245  J 14835
2073                BNQ    ITR                                               7  07252  J 01007 Q
2074                BCE    FLDOK,TAD1,1        REPEAT THIS ROUTINE          12  07259  B 06980 01001 1
```

```
PGLIN     LABEL     OPCOD  OPERAND                                        CT  ADDRS  INSTRUCTION

2075      **********************************************************
2076      *      CHECK WRITE END OF MEMORY MOVE MODE EVEN PARITY*
2077      **********************************************************
2078                BCE    *&8,OLSW,1          BR IF OVERLAP MODE          12  07271  B 07290 16896 1
2079                B      BL7                 BR IF NOT OVERLAP MODE       7  07283  J 07309
2080                BCE    *&8,SYS1,X          BR IF 7010                  12  07290  B 07309 01256 X
2081                B      BL11                                             7  07302  J 07506
2082      BL7       BSP    11                                               5  07309  U %01 B
2083                BCB1   *-11                                             7  07314  R 07309 2
2084                BA1    TERR                                             7  07321  R 14288 GM
2085                SW     WT2&10              SET BAR                      6  07328  , 07351
2086                SBR    OPERT&5                                          7  07334  G 14338 B
2087      WT2       WTF    11,0                WR TP MOVE MODE EVEN-END OF MEM 10  07341  M %01 00000 X
2088                SBR    RDEND               UN-OVERLAP STORE REG         7  07351  G 16695 B
2089                BCL1   CIP1                                             7  07358  J 05067 1
2090      CREG1     SBR    RDEND                                            7  07365  G 16695 B
2091                BCB1   WT2                                              7  07372  R 07341 2
2092                BA1    TERR                                             7  07379  R 14288 GM
2093                B      OLTST                                            7  07386  J 05211
2094                C      RDEND,CWOWM                                     11  07393  C 16695 16690
2095                BE     WEA                 OK                           7  07404  J 07487 S
2096                MLNA   RDEND,EM1           END ADDR TO T/O             12  07411  D 16695 07472 /
2097                B      TYP1                                             7  07423  J 01091
2098      EM1       DCW    @ WR END MEM FAIL-M MODE EVEN-END ADDR-    @,G  43  07472
2099                BCE    *&2,TAC2,           BYPASS ERROR HALT           12  07474  B 07487 01002
2100                H                                                       1  07486  .
2101      WEA       BNQ    ITR                                              7  07487  J 01007 Q
2102                BCE    BL7,TAC1,1          REPEAT THIS ROUTINE         12  07494  B 07309 01001 1
```

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PGLIN     LABEL      OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION

21C4      **************************************************
21C5      * WR REC EVEN PAR WITH RADICAL SIGN AS 2ND CHAR    *
21C6      * BSP-RC EVEN PARITY-SHOULC NOT TURN ON END OF FILE *
21C7      **************************************************
21C8      BL11       SW     WT6&10                            6  07506  , 07529
21C9                 SBR    OPERT&5                           7  07512  G 14338 B
2110      WT6        WT     11,WTAPEE      WR RECOD WITH 2ND CHAR TM  10  07519  M 3U1 16055 W
2111                 BOL1   CIP1                              7  07529  J 05067 1
2112                 BCB1   WT6                               7  07536  R 07519 2
2113                 BAL    TERR                              7  07543  R 14288 MG
2114                 B      OLTST                             7  07550  J 05211
2115      BSPX13     BSP    11                                5  07557  U 3U1 B
2116                 BCB1   *-11                              7  07562  R 07557 2
2117                 BAL    TERR                              7  07569  R 14288 MG
2118                 SW     RT4&10          SET BAR           6  07576  , 07617
2119                 SBR    OPERT&5                           7  07582  G 14338 B
2120                 MLCWA  BLEND,TPEND     BLANK RD FLD      12  07589  D 17731 17531 X
2121                 CW     TREAD                             6  07601  ¤ 17400
```

```
PGLIN     LABEL     CPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2123      RT4       RT     11,TREAD&130                             10  07607  M %U1 17530 R
2124                BOL1   CIP1                                      7  07617  J 05067 1
2125                BCB1   RT4                                       7  07624  R 07607 2
2126                BA1    *&1                                       7  07631  R 07638 GM
2127                B      CLTST                                     7  07638  J 05211
2128                BEF1   *&8              ERROR                    7  07645  R 07659 8
2129                B      NOE                                       7  07652  J 07730
2130                BA1    *&1                                       7  07659  R 07666 GM
2131                B      TYP1                                      7  07666  J 01091
2132      SCTM      DCW    @ UNEXPECTED EOF-RADICAL WAS 2ND CHAR@,G 36  07673
2133      TMHLT     BCE    *&2,TAD2,        BYPASS ERROR HALT       12  07710  B 07723 01002
2134                H                                                1  07722  .
2135                DCW    @J@                                       1  07723
2136                DC     NOE                                       5  07728  07730
2137                DC     @K@                                       1  07729
2138      NOE       BA1    *&1                                       7  07730  R 07737 GM
2139                BNQ    ITR                                       7  07737  J 01007 Q
2140                BCE    BL11,TAD1,1      REPEAT THIS ROUTINE     12  07744  B 07506 01001 1
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2142      **********************************************************
2143      *     WR REC ODD PAR WITH RADICAL SIGN AS 1ST CHAR       *
2144      *     BSP AND RD RECORD ODD PARITY-NO ERRORS EXPECTED    *
2145      **********************************************************
2146      BL2A      BSP    11                                         5  07756  U %01 B
2147                BCB1   *-11                                       7  07761  R 07756 2
                                                                                   G
2148                BA1    TERR                                       7  07768  R 14288 M
2149                SW     BL2A1&10          SET BAR                  6  07775  , 07798
2150                SBR    OPERT&5                                    7  07781  G 14338 B
2151      BL2A1     WTB    11,WTAPEE&1         AS THE 1 CHAR RECORD   10  07788  M %B1 16056 W
2152                BCL1   OIP1                                       7  07798  J 05067 1
2153                BCB1   BL2A1                                      7  07805  R 07788 2
                                                                                   G
2154                BA1    TERR                                       7  07812  R 14288 M
2155                B      OLTST                                      7  07819  J 05211
2156      BSPA1     BSP    11                                         5  07826  U %01 B
2157                BCB1   *-11                                       7  07831  R 07826 2
                                                                                   G
2158                BA1    TERR                                       7  07838  R 14288 M
2159                SW     BL2A2&10          SET BAR                  6  07845  , 07868
2160                SBR    OPERT&5                                    7  07851  G 14338 B
2161      BL2A2     RTB    11,TREAD&131      RD    ODD PARITY NO ERR EXPECTED  10  07858  M %B1 17531 R
2162                BCL1   OIP1                                       7  07868  J 05067 1
2163                BCB1   BL2A2                                      7  07875  R 07858 2
                                                                                   G
2164                BA1    TERR                                       7  07882  R 14288 M
2165                B      OLTST                                      7  07889  J 05211
2166                BNQ    ITR                                        7  07896  J 01007 Q
2167                DCW    @J@                                        1  07903
2168                DC     BLCO                                       5  07908  07910
2169                DC     @K@                                        1  07909
2170      BLOO      BCE    BL2A,TAD1,1       REPEAT THIS ROUTINE     12  07910  B 07756 01001 1
```

```
PGLIN   LABEL   OPCOD  OPERAND                                           CT  ADDRS  INSTRUCTION

2172            ************************************************
2173            * WR ANC RD EVEN PAR MOVE MOCE-REC IS A RADICAL SIGN *
2174            ************************************************
2175    BL3A0   BSP    11                                                 5  07922  U %U1 B
2176            BCB1   *-11                                               7  07927  R 07922 2
                                                                                              G
2177            BA1    TERR                                               7  07934  R 14288 M
2178            SW     BL3A&10           SET BAR                          6  07941  , 07964
2179            SBR    OPERT&5                                            7  07947  G 14338 B
2180    BL3A    WT     11,WTAPEE&1         AS 1 CHAR RECORD              10  07954  M %U1 16056 W
2181            BCL1   OIP1                                               7  07964  J 05067 1
2182            BCB1   BL3A                                               7  07971  R 07954 2
                                                                                              G
2183            BA1    TERR                                               7  07978  R 14288 M
2184            B      OLTST                                              7  07985  J 05211
2185            BSP    11                                                 5  07992  U %U1 B
2186            BCB1   *-11                                               7  07997  R 07992 2
                                                                                              G
2187            BA1    TERR                                               7  08004  R 14288 M
2188            SW     BL3A1&10          SET BAR                          6  08011  , 08034
2189            SBR    OPERT&5                                            7  08017  G 14338 B
2190    BL3A1   RT     11,TREAD&131      RD M-EVEN   1ST CHAR-EOF EXPECTED  10  08024  M %U1 17531 R
2191            BCL1   OIP1                                               7  08034  J 05067 1
2192            BCB1   BL3A1                                              7  08041  R 08024 2
2193            BEF1   *&15                                               7  08048  R 08069 8
                                                                                              G
2194            BA1    *&1                                                7  08055  R 08062 M
2195            B      EOFERR                                             7  08062  J 14545
                                                                                              G
2196            BA1    *&1                                                7  08069  R 08076 M
2197            B      OLTST                                              7  08076  J 05211
2198            BNQ    ITR                                                7  08083  J 01007 Q
2199            DCW    @J@                                                1  08090
2200            DC     BLCW                                               5  08095  08097
2201            DC     @K@                                                1  08096
2202    BLCW    BCE    BL3A0,TAC1,1                                      12  08097  B 07922 01001 1
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2204      ********************************************************
2205      * TO TEST FOR TP IND. AND TO SEE THAT IT TURNS IT OFF*
2206      ********************************************************
2207      BSPXA     BSP    11                                                5  08109  U %U1 B
2208                BCBI   BSPXA                                             7  08114  R 08109 2
2209                BAI    TERR                                              7  08121  R 14288 GM
2210                SW     RTMA&5             SET BAR                        6  08128  , 08146
2211                SBR    OPERT&5                                           7  08134  G 14338 B
2212      RTMA      CU     %U1,A              SPACE OVER TM                  5  08141  U %U1 A
2213                BCBI   RTMA                                             7  08146  R 08141 2
2214                B      DELAY                                             7  08153  J 15089 G
2215      TSJK      BAI    TERR                                              7  08160  R 14288 M
2216                DCW    @J@                                               1  08167
2217                DC     OKA                SHOULD BR IF TP INDICATE ON    5  08172  08238
2218                DC     @K@                AND TURN IT OFF                1  08173
2219                B      TYP1                                              7  08174  J 01091
2220                DCW    @BR INTERNAL INDICATOR D MOD-K FAILED@,G          36  08216
2221                BCE    *&2,TAD2,          BYPASS ERROR HLT               12  08218  B 08231 01002
2222                H                                                        1  08230  .
2223                B      BYPS                                              7  08231  J 08321
2224      CKA       DCW    @J@                SHOULD NOT BR THIS TIME        1  08238
2225                DC     OKB                                               5  08243  08252
2226                DC     @K@                                               1  08244
2227                B      BYPS                                              7  08245  J 08321
2228      CKB       B      TYP1                                              7  08252  J 01091
2229                DCW    @BR INTERNAL INDICATOR D MOD-K DID NOT SET TI OFF@,G  48  08306
2230                BCE    *&2,TAD2,                                        12  08308  B 08321 01002
2231                H                                                        1  08320  .
2232      BYPS      BNQ    ITR                                               7  08321  J 01007 Q
2233                BCE    BSPXA,TAD1,1                                     12  08328  B 08109 01001 1
```

```
PGLIN    LABEL     OPCOD  CPERAND                                  CT  ADDRS  INSTRUCTION

2235     ****************************************************
2236     *      CHECK- SPACE                                 *
2237     ****************************************************
2238     SPC       BSP    11                                        5  08340  U %U1 B
2239               BCB1   *-11                                      7  08345  R 08340 2
                                                                                      G
2240               BA1    TERR                                      7  08352  R 14288 M
                                                                                      G
2241               BA1    *&1                                       7  08359  R 08366 M
2242               SW     SPC1&10          SET BAR                  6  08366  , 08395
2243               SBR    CPERT&5                                   7  08372  G 14338 B
2244               S      BCNT                                      6  08379  S 16898
2245     SPC1      WT     11,SPCX          WR 10 ONES TWICE        10  08385  M %U1 16790 W
2246               BOL1   OIP1                                      7  08395  J 05067 1
2247               BCB1   SPC1                                      7  08402  R 08385 2
                                                                                      G
2248               BA1    TERR                                      7  08409  R 14288 M
2249               B      OLTST                                     7  08416  J 05211
2250               A      ONES,BCNT                                11  08423  A 01183 16898
2251               BCE    *&8,BCNT,2                               12  08434  B 08453 16898 2
2252               B      SPC1                                      7  08446  J 08385
2253               SW     SPC2&5           SET BAR                  6  08453  , 08471
2254               SBR    OPERT&5                                   7  08459  G 14338 B
2255     SPC2      WTM    11                                        5  08466  U %U1 M
2256               BOL1   OIP1                                      7  08471  J 05067 1
2257               BCB1   SPC2                                      7  08478  R 08466 2
                                                                                      G
2258               BA1    TERR                                      7  08485  R 14288 M
2259               B      OLTST                                     7  08492  J 05211
2260     SPC3      BSP    11                                        5  08499  U %U1 B
2261               BCB1   SPC3                                      7  08504  R 08499 2
                                                                                      G
2262               BA1    TERR                                      7  08511  R 14288 M
2263     SPC4      BSP    11                                        5  08518  U %U1 B
2264               BCB1   SPC4                                      7  08523  R 08518 2
                                                                                      G
2265               BA1    TERR                                      7  08530  R 14288 M
2266               SW     SPC5&5           SET BAR                  6  08537  , 08561
2267               SBR    CPERT&5                                   7  08543  G 14338 B
2268               CS     TPEND            CLEAR RD AREA            6  08550  / 17531
2269     SPC5      CU     %U1,A            SPACE                    5  08556  U %U1 A
2270               BCB1   SPC5                                      7  08561  R 08556 2
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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2271                B      DELAY                                     7  08568  J 15089
2272                BA1    TERR                                      7  08575  R 14288 GM
2273                DCW    @J@                                       1  08582
2274                DC     SPCER                                     5  08587  08596
2275                DC     @K@                                       1  08588
2276                B      SPCCK                                     7  08589  J 08644
2277      SPCER     B      TYP1                                      7  08596  J 01091
2278      SPCER1    DCW    @SPACE FAILED-SPACED TOO FAR@,G          27  08629
2279                BCE    *&2,TAD2,          BYPASS HLT            12  08631  B 08644 01002
2280                H                                                1  08643  .
2281      SPCCK     SW     TREAD&122                                 6  08644  , 17522
2282                C      TPEND,BL1&9                              11  08650  C 17531 17609
2283                BE     SPCK               SPACE  OK              7  08661  J 08727 S
2284                CW     TREAD&122                                 6  08668  □ 17522
2285                B      TYP1                                      7  08674  J 01091
2286      SPFAIL    DCW    @SPACE FAILED-DATA WAS TRANSFERED@,G     32  08712
2287                BCE    *&2,TAD2,          BYPASS HLT            12  08714  B 08727 01002
2288                H                                                1  08726  .
2289      SPCK      SW     SPC6&5             SET BAR                6  08727  , 08745
2290                SBR    OPERT&5                                   7  08733  G 14338 B
2291      SPC6      CU     %U1,A              SPACE-SHOULD TURN ON T.I.  5  08740  U %U1 A
2292                BCB1   SPC6                                      7  08745  R 08740 2
2293                B      DELAY                                     7  08752  J 15089
2294                DCW    @J@                                       1  08759
2295                DC     SPCC                                      5  08764  08780
2296                DC     @K@                                       1  08765
2297                BA1    *&1                                       7  08766  R 08773 GM
2298                B      EOFERR                                    7  08773  J 14545
2299      SPCC      BA1    TERR                                      7  08780  R 14288 GM
```

```
PGLIN   LABEL   OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

2301    ***************************************************
2302    *       CHECK SKIP
2303    ***************************************************
2304    BL3     BSP    11                                          5  08787  U %U1 B
2305            BCB1   *-11                                        7  08792  R 08787 2
                                                                                     G
2306            BA1    TERR                                        7  08799  R 14288 M
2307            SW     WTZ&10                                      6  08806  , 08835
2308            SBR    OPERT&5                                     7  08812  G 14338 B
2309            S      BCNT                                        6  08819  S 16898
2310    WTZ     WT     11,SPCX           10 ONES                  10  08825  M %U1 16790 W
2311            BCL1   OIP1                                        7  08835  J 05067 1
2312            BCB1   WTZ                                         7  08842  R 08825 2
                                                                                     G
2313            BA1    TERR                                        7  08849  R 14288 M
2314            B      CLTST                                       7  08856  J 05211
2315            A      ONES,BCNT                                  11  08863  A C1183 16898
2316            BCE    TWC,BCNT,2        REC-TM-REC WRITTEN       12  08874  B 08939 16898 2
2317            SW     WTZQ&5                                      6  08886  , 08904
2318            SBR    OPERT&5                                     7  08892  G 14338 B
2319    WTZQ    WTM    11                                          5  08899  U %U1 M
2320            BCL1   OIP1                                        7  08904  J 05067 1
2321            BCB1   WTZQ                                        7  08911  R 08899 2
                                                                                     G
2322            BA1    TERR                                        7  08918  R 14288 M
2323            B      OLTST                                       7  08925  J 05211
2324            B      WTZ                                         7  08932  J 08825
2325    TWC     SW     SKP&5                                       6  08939  , 08957
2326            SBR    OPERT&5                                     7  08945  G 14338 B
2327    SKP     SKP    11                SET SKIP                  5  08952  U %U1 E
2328            BCB1   *-11                                        7  08957  R 08952 2
                                                                                     G
2329            BA1    TERR                                        7  08964  R 14288 M
2330            SW     WTZZ                                        6  08971  , 08984
2331            SBR    OPERT&5                                     7  08977  G 14338 B
2332    WTZZ    WTM    11                                          5  08984  U %U1 M
2333            BCL1   OIP1              TAPE MARK                 7  08989  J 05067 1
2334            BCB1   WTZZ                                        7  08996  R 08984 2
                                                                                     G
2335            BA1    TERR                                        7  09003  R 14288 M
2336            B      CLTST                                       7  09010  J 05211
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2337		S	BCNT		6	09017	S 16898
2338	BSPADD	BSP	11		5	09023	U %U1 B
2339		BCB1	BSPADD		7	09028	R 09023 2
2340		BA1	TERR		7	09035	R 14288 GM
2341		A	ONES,BCNT		11	09042	A 01183 16898
2342		BCE	*&8,BCNT,4		12	09053	B 09072 16898 4
2343		B	BSPADD		7	09065	J 09023
2344		S	CTR1	GAP CTR	6	09072	S 16907
2345		S	CTR2	SPACE CTR	6	09078	S 16914
2346		SW	RTZ&10		6	09084	, 09107
2347		SBR	OPERT&5		7	09090	G 14338 B
2348	RTZ	RT	11,TREAD&122	SB-10 ONES	10	09097	M %U1 17522 R
2349		BOL1	OIP1		7	09107	J 05067 1
2350		BCB1	RTZ		7	09114	R 09097 2
2351		BA1	TERR		7	09121	R 14288 GM
2352		B	OLTST		7	09128	J 05211
2353		SW	SPAC1&5		6	09135	, 09160
2354		SBR	OPERT&5		7	09141	G 14338 B
2355		BAV	*&1		7	09148	J 09155 Z

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PGLIN     LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
2357      SPAC1     CU     %U1,A      SPACE OVER TM    5  09155  U %U1 A
2358                BCB1   *-11                        7  09160  R 09155 2
2359                BNR1   TERR                       7  09167  R 14288 1
2360      ITI       DCW    @J@                        1  09174
2361                DC     GAPA                       5  09179  09206
2362                DC     @K@                        1  09180
2363                A      ONES,CTR1  GAP CTR        11  09181  A 01183 16907
2364                BAV    OFLOW                      7  09192  J 09405 Z
2365                B      ITI                        7  09199  J 09174
2366      GAPA      BA1    *&1                        7  09206  R 09213 GM
2367                SW     RTZA&10                    6  09213  , 09236
2368                SBR    OPERT&5                    7  09219  G 14338 B
2369      RTZA      RT     11,TREAD&122              10  09226  M %U1 17522 R
2370                BOL1   OIP1                       7  09236  J 05067 1
2371                BCB1   RTZA                       7  09243  R 09226 2G
2372                BA1    TERR                       7  09250  R 14288 M
2373                B      OLTST                      7  09257  J 05211
2374                SW     SPACE2&5                   6  09264  , 09289
2375                SBR    OPERT&5                    7  09270  G 14338 B
2376                BAV    *&1                        7  09277  J 09284 Z
2377      SPACE2    CU     %U1,A                      5  09284  U %U1 A
2378                BCB1   *-11                       7  09289  R 09284 2
2379                BNR1   TERR                       7  09296  R 14288 1
2380      ITI1      DCW    @J@                        1  09303
2381                DC     GAPB                       5  09308  09335
2382                DC     @K@                        1  09309
2383                A      ONES,CTR2                 11  09310  A 01183 16914
2384                BAV    OFLOW                      7  09321  J 09405 Z
2385                B      ITI1                       7  09328  J 09303
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2387	GAPB	BA1	*&1		7	09335	R 09342 M (G above M)
2388		A	CTR1		6	09342	A 16907
2389		C	CTR1,CTR2		11	09348	C 16907 16914
2390		BH	SKIPR		7	09359	J 09450 U
2391		B	TYP1		7	09366	J 01091
2392		DCW	@SKIP FAILED@,G		11	09383	
2393		BCE	*&2,TAD2,	BYPASS HLT	12	09385	B 09398 01002
2394		H			1	09397	.
2395		B	SKIPR		7	09398	J 09450
2396	CFLOW	BA1	*&1		7	09405	R 09412 M (G above M)
2397		B	TYP1		7	09412	J 01091
2398		DCW	@FAILED TO SET TI.@,G		17	09435	
2399		BCE	*&2,TAD2,	BYPASS HLT	12	09437	B 09450 01002
2400		H			1	09449	.
2401	SKIPR	BNQ	ITR		7	09450	J 01007 Q
2402		BCE	BL3,TAD1,1	REPEAT ROUTINE	12	09457	B 08787 01001 1

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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2404      **********************************************************
2405      *      CHECK READ TO END OF RECORD                       *
2406      **********************************************************
2407                BCE    *&8,OLSW,1          BR IF OVERLAP MODE   12  09469  B 09488 16896 1
2408                B      EREC1                                    7  09481  J 09507
2409                BCE    *&8,SYS1,X          BR IF 7010           12  09488  B 09507 01256 X
2410                B      UPCT1                                    7  09500  J 09704
2411      EREC1     BSP    11                  OVER TM              5  09507  U %U1 B
2412                BCB1   EREC1                                    7  09512  R 09507 2
                                                                                 G
2413                BA1    TERR                                     7  09519  R 14288 M
2414      EREC2     BSP    11                  OVER RECORD OF 10 ONES  5  09526  U %U1 B
2415                BCB1   EREC2                                    7  09531  R 09526 2
                                                                                 G
2416                BA1    TERR                                     7  09538  R 14288 M
2417                SW     EREC3&10            SET BAR              6  09545  , 09580
2418                SBR    OPERT&5                                  7  09551  G 14338 B
2419                MLCWA  WMGM,19995                               12  09558  D 16192 19995 X
2420      EREC3     RTG    11,19990            NO ERRORS EXPECTED   10  09570  M %U1 19990 $
2421                BCL1   CIP1                                     7  09580  J 05067 1
2422                BCB1   EREC3                                    7  09587  R 09570 2
                                                                                 S
2423                BEX1   TERR,M             ANY BUT WLR          7  09594  R 14288 M
                                S                                                G
2424                BA1    *&1                                      7  09601  R 09608 M
2425                B      OLTST                                    7  09608  J 05211
2426                SW     19995                                    6  09615  , 19995
2427                C      19999,SPCX&4        CMP TO 11111         11  09621  C 19999 16794
2428                BE     UPCT1                                    7  09632  J 09704 S
2429      RFAIL     B      TYP1                                     7  09639  J 01091
2430      RFAILA    DCW    @ RD END OF REC. FAILED-WMGM IN RD FLD@,G   37  09682
2431                BNQ    ITR                                      7  09684  J 01007 Q
2432                BCE    *&2,TAD2,           BYPASS HLT           12  09691  B 09704 01002
2433                H                                               1  09703  .
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

2435      **********************************************************
2436      *     UPDATE FOR NEXT TAPE                                 *
2437      **********************************************************
2438      UPDT1     A      TWOS,X2           ADD 2 TO INDEX 2          11  09704  A 01195 00034
2439                B      FRDY1                                        7  09715  J 05755
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2441    ************************************************************
2442    *     1301 AND 1311 ROUTINES                               *
2443    ************************************************************
2444    FILE     SBR    FILERE&5                                          7  09722  G 09770 B
2445             MLCWS  TEST1,MODSV          CLEAR MODULE SAVE           12  09729  D 15920 16504 7
2446             BCE    F1301,CHN1&19&X6,F   BR IF 1301                  12  09741  B 10297 01T.8 F
2447             BCE    F1311,CHN1&22&X6,R   BR IF 1311                  12  09753  B 12421 01TJ1 R
2448    FILERE   B      0                    RETURN TO PROGRAM            7  09765  J 00000
2449    SERR     SBR    SERRR&5                                           7  09772  G 09852 B
2450             BCE    SERH,TAD1,1                                      12  09779  B 09834 01001 1
2451             B      TYP1                                              7  09791  J 01091
2452             DCW    @ 1311 FAILED TO SEEK TO CORRECT LOC@,G          35  09832
2453    SERH     BCE    *&2,TAD2,                                        12  09834  B 09847 01002
2454             H                                                        1  09846  .
2455    SERRR    B      0                                                 7  09847  J 00000
2456    CLEAR    SBR    CRET&5               STORE BAR FOR RETURN         7  09854  G 09909 B
2457             SW     17000                                             6  09861  , 17000
2458    LABONE   CS     19999                                             6  09867  / 19999
2459             SBR    *-7                  STORE BAR FOR NEXT 100       7  09873  G 09872 B
2460             BW     LABONE,17000         BR IF WM IN 17000           12  09880  V 09867 17000 1
2461             MLNA   CACD,LABONE&5        RESTORE CLEAR INSTR.        12  09892  D 01177 09872 /
2462    CRET     B      0                    RETURN TO PROGRAM            7  09904  J 00000
2463    LFORM    MLCA   FOURS,17023          AREA E                      12  09911  D 01219 17023 T
2464             MLCA   THREES&9             AREA D                       6  09923  D 01216
2465             MLCA   FOURS                AREA C                       6  09929  D 01219
2466             MLCA   THREES&8             AREA B                       6  09935  D 01215
2467             MLCA   FOURS&2              AREA A                       6  09941  D 01221
2468    MOVESW   NOPWM                       SWITCH                       1  09947  N
2469             B      MFORM&13             BR IF SETTING MOVE FORMAT    7  09948  J 10090
2470             MLCA   FOURS,17063          AREA L                      12  09955  D 01219 17063 T
2471             MLCA   THREES&9             AREA K                       6  09967  D 01216
2472             MLCA   FOURS                AREA J                       6  09973  D 01219
2473             MLCA   THREES&9             AREA H                       6  09979  D 01216
2474             MLCA   FOURS&11             AREA G                       6  09985  D 01230
2475             MLCA   THREES&5             AREA F                       6  09991  D 01212
2476             MLCWS  WMGM,17133           SET TRK LEN AT 64           12  09997  D 16192 17133 7
```

```
PGLIN     LABEL     OPCOD  OPERAND
2477                MLCWS  FOURS                AREA P
2478                SBR    89                   BUILD
2479      LOADM     MLCS   THREES,0&X13               AREA
2480                S      ONES,89                        M
2481                C      89,FORAD                        FOR
2482                BE     *&8                                64
2483                B      LOADM                                CHARS
2484                B      LFRET                RETURN TO PROGRAM
2485      MFORM     SW     MOVESW&1
2486                B      LFORM                GO TO SET HA FORMAT
2487                CW     MOVESW&1
2488                MLCA   TWOS,17063           AREA L
2489                MLCA   ONES&9               AREA K
2490                MLCA   TWOS                 AREA J
2491                MLCA   ONES&9               AREA H
2492                MLCA   TWOS&11              AREA G
2493                MLCA   ONES&5               AREA F
2494                MLCWS  WMGM,17133           SET WMGM
2495                MLCA   TWOS                 AREA P
2496                SBR    89                   BUILD
2497      MOVEM     MLCS   ONES,0&X13                 AREA
2498                S      ONES,89                        M
2499                C      89,FORAD                        FOR
2500                BE     *&8                                64
2501                B      MOVEM                                CHARS
2502                B      MFRET                RETURN TO PROGRAM
2503      COMPER    SBR    COMPRE&5
2504                B      TYP1
2505                DCW    @DATA READ DOES NOT COMPARE WITH DATA WRITTEN@,G
2506                BCE    *&2,TAD2,
2507                H
2508      COMPRE    B      0
2509      F1301     MLNS   ONES,UNITSV
2510                S      TPTBL&9              RESET
2511                S                                TABLE
2512                S                                    OF
```

```
CT  ADDRS  INSTRUCTION
 6  10009  D 01219
 7  10015  G 00089 B
12  10022  D 01207 00M≠0 3
11  10034  S 01183 00089
11  10045  C 00089 01182
 7  10056  J 10070 S
 7  10063  J 10022
 7  10070  J 11303
 6  10077  , 09948
 7  10083  J 09911
 6  10090  ¤ 09948
12  10096  D 01195 17063 T
 6  10108  D 01192
 6  10114  D 01195
 6  10120  D 01192
 6  10126  D 01206
 6  10132  D 01188
12  10138  D 16192 17133 7
 6  10150  D 01195
 7  10156  G 00089 B
12  10163  D 01183 00M≠0 3
11  10175  S 01183 00089
11  10186  C 00089 01182
 7  10197  J 10211 S
 7  10204  J 10163
 7  10211  J 10861
 7  10218  G 10295 B
 7  10225  J 01091
44  10275
12  10277  B 10290 01002
 1  10289  .
 7  10290  J 00000
12  10297  D 01183 16506 1
 6  10309  S 16426
 1  10315  S
 1  10316  S
```

```
PGLIN    LABEL    OPCOD  OPERAND                                                  CT  ADDRS  INSTRUCTION

2513              S                                  AVAIL                         1  10317  S
2514              S                                          MODULES               1  10318  S
2515              S                      RESET                                     1  10319  S
2516              S                           TABLE                                1  10320  S
2517              S                                OF                              1  10321  S
2518              S                                  AVAIL                         1  10322  S
2519              S                                          MODULES               1  10323  S
2520              SW     95,90           SET                                      11  10324  , 00095 00090
2521              SW     85,80              INDEX                                 11  10335  , 00085 00080
2522              SW     75,70                   REGS                             11  10346  , 00075 00070
2523              SW     MFRET&1                                                   6  10357  , 10862
2524              S      99                          TO                            6  10363  S 00099
2525              S                                    INITIAL                     1  10369  S
2526              S                                           STATE                1  10370  S
2527              S                                                OF              1  10371  S
2528              S                                                  ZERO          1  10372  S
2529              S                                                                1  10373  S
2530              MLNA   MARGAD,STST01&35                                         12  10374  D 16864 10690 /
2531              MLNA   JIMAD,STSTC1&23                                          12  10386  D 16835 10678 /
                                                                                                           D
2532              MRCWG  ZEROAD,17991    MOVE 1301 OR      ADD 0000               12  10398  D 16805 17991 L
                                                                                                           D
2533              MRCWG  ZEROAD,16991                                             12  10410  D 16805 16991 L
2534              SW     17991,17992     SET WM S                                 11  10422  , 17991 17992
2535              SW     17993,16993             IN                               11  10433  , 17993 16993
2536              SW     16991,16992               ADDRESSES                      11  10444  , 16991 16992
2537              A      ONES,17994      ALTER ADDRESS 2 TO 100                   11  10455  A 01183 17994
2538              MLNA   F1301AC,6       MOVE RESTART ADD TO LOC /                12  10466  D 01172 00006 /
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2540	SEEKO1	SD	1,16991	SEEK TO ZERO	10	10478	M %F0 16991 R
2541		BCB1	*-16		7	10488	R 10478 2
2542		BA1	*&1		7	10495	R 10502 GM
2543		SD	1,17991	SEEK TO 100	10	10502	M %F0 17991 R
2544		BCB1	*-16		7	10512	R 10502 2
2545		BA1	*&1		7	10519	R 10526 GM
2546		SD	1,17991	SEEK TO 100 AGAIN	10	10526	M %F0 17991 R
2547		BCB1	STEPP1	BR IF 1301	7	10536	R 10561 2
2548		BNR1	STEPP2	BR IF NOT AVAIL	7	10543	R 10584 1
2549		A	ONES,TPTBL&X15	ADD 1 TO TABLE	11	10550	A 01183 16DA7
2550	STEPP1	MLNS	ONES,MODSV		12	10561	D 01183 16504 1
2551		A	ONES,TPTBL&X15	ADD 1 TO TABLE	11	10573	A 01183 16DA7
2552	STEPP2	A	ONES,X15	ADD 1 TO INDEX 15	11	10584	A 01183 00099
2553		A	ONES,17992	ADD 1 TO MODULE NUMBER	11	10595	A 01183 17992
2554		A	ONES,16992	ADD 1 TO MODULE NUMBER	11	10606	A 01183 16992
2555		BA1	*&1		7	10617	R 10624 GM
2556		BCE	*&8,99,0	BR IF TRIED ALL MODULES	12	10624	B 10643 00099 0
2557		B	SEEKO1		7	10636	J 10478
2558		CW	SW77		6	10643	¤ 10759
2559		SW	MFRET&1		6	10649	, 10862
2560	STSTO1	S	X15	SET X15 TO 0	6	10655	S 00099
2561		BCE	PASS,TPTBL&X15,0	BR IF NO MODULE AVAIL	12	10661	B 11879 16DA7 0
2562		BCE	JIM,TPTBL&X15,1	BR IF 1301	12	10673	B 10698 16DA7 1
2563		BCE	MARGO,TPTBL&X15,2	BR	12	10685	B 11848 16DA7 2
2564		H			1	10697	.
2565	JIM	MLCS	99,16992	SET MODULE NO. IN ADDR.	12	10698	D 00099 16992 3
2566		MLCA	DIAGAD,16996	MOVE DIAGNOSTIC ADDR	12	10710	D 16804 16996 T
2567		MLNA	ADC1,FILEOP&8		12	10722	D 16854 12081 /
2568		SD	1,16991	SEEK TO DIAGNOSTIC ADDR.	10	10734	M %F0 16991 R
2569		BCB1	*-16		7	10744	R 10734 2
2570		BA1	*&1		7	10751	R 10758 GM

```
PGLIN  LABEL  CPCOD  OPERAND                                                    CT  ADDRS  INSTRUCTION

2572          NCPWM                                                              1  10758  N
2573   SW77   B      LAB1                  BR IF NOT 1ST PASS CN CHANNEL          7  10759  J 10841
2574          MLCS   CHNTS&13,*&15                                              12  10766  D C2700 10792 3
2575          B      TYP1                                                        7  10778  J 01091
                                    B
2576          DCW    @SET CH. ,7631 SWSS.----HAO ON WR INHIB OFF@               42  10826
2577          DCW    @,FORMAT TC WR@,G                                          13  10839
2578   LAB1   SW     SW77                                                        6  10841  , 10759
2579          B      CLEAR                 GO TO CLEAR FILE AREA                  7  10847  J 09854
2580          B      MFCRM                 GC TO SET MOVE FORMAT                  7  10854  J 10077
2581   MFRET  NCP                                                                1  10861  N
2582          H                                                                  1  10862  .
2583          CW     *-6                                                         6  10863  ¤ 10862
2584          MLCS   WWW,FILEOP&9          SET TO WR.                            12  10869  D 16814 12082 3
2585          MLCS   SEVEN,FILECP&3                    FORMAT MOVE              12  10881  D 16843 12076 3
2586          MLCS   MMM,FILEOP                                   MODE          12  10893  D 16817 12073 3
2587          CW     SW79                  TURN 1311 ERROR SW CFF                 6  10905  ¤ 12113
2588          SW     SW69                  TURN 1301 ERROR SW ON                  6  10911  , 12105
2589   LAB2   B      FILEOP-7              GO TO WRITE FORMAT                     7  10917  J 12066
2590          BNQ    ITR                                                         7  10924  J 01007 Q
2591          BCE    LAB2,TAD1,1           BR IF LOOP                            12  10931  B 10917 01001 1
2592   LAB3   B      CLEAR                 GC TO CLEAR FILE AREA                  7  10943  J 09854
2593          MLCS   EIGHT,17001           SET HA2                               12  10950  D 16891 17001 3
2594          MLCS   EIGHT                          AT 88                         6  10962  D 16891
2595          MLCS   FIVE,FILEOP&3         FILE OP TO WR HAO                     12  10968  D 16842 12076 3
2596          CW     SW69                  TURN OFF 1301 ERR SW                   6  10980  ¤ 12105
2597          B      FILEOP-7              GO TO WR HA2                           7  10986  J 12066
                           S                                                                        S
2598          BEX1   E1301,M               BR ANY BUT WLR                         7  10993  R 12134 M
                                                                                                    G
2599          BA1    *&1                                                         7  11000  R 11007 M
2600          SW     SW69                  TURN ON 1301 ERR SW                    6  11007  , 12105
2601          B      CLEAR                 GO TO CLEAR FILE AREA                  7  11013  J 09854
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2603		MLCA	ALPHAP&63,17063	MOVE ALL 64 POSSIBLE CHARS	12	11020	D 16121 17063 T
2604		MLCWS	WMGM,17064	SET WMGM	12	11032	D 16192 17064 7
2605		MLCS	TWOS,FILEOP&3	ALTER FILE OP TO TRK	12	11044	D 01195 12076 3
2606		B	FILEOP-7	GO TO WRITE TRK	7	11056	J 12066
2607		MLCS	THREES,FILEOP&3	ALTER FILE OP TO RBC	12	11063	D 01207 12076 3
2608		B	FILEOP-7	GO TO PERFORM WDC	7	11075	J 12066
2609		MLCS	TWOS,FILEOP&3	SET FILEOP TO	12	11082	D 01195 12076 3
2610		MLCS	RRR,FILEOP&9	RD TRK	12	11094	D 16815 12082 3
2611		B	CLEAR	GO TO CLEAR FILE AREA	7	11106	J 09854
2612		MLCWS	WMGM,17064	SET WMGM	12	11113	D 16192 17064 7
2613		B	FILEOP-7	GO TO RD TRK	7	11125	J 12066
2614		SW	17000	SET WM FOR CMP	6	11132	, 17000
2615		C	17063,ALPHAP&63	SEE IF SAME	11	11138	C 17063 16121
2616		BU	COMPER		7	11149	J 10218 /
2617		BNQ	ITR		7	11156	J 01007 Q
2618		MLCS	WWW,FILEOP&9	SET FILEOP TO WR	12	11163	D 16814 12082 3
2619		BCE	LAB3,TAD1,1	BR IF LOOP	12	11175	B 10943 01001 1
2620		SW	16995		6	11187	, 16995
2621		A	ONES,16996	ADD 1 TO TRK NUMBER	11	11193	A 01183 16996
2622		CW	16995		6	11204	¤ 16995
2623		BCE	CNEED,TPTBL&X15,2		12	11210	B 11259 160A7 2
2624		C	16996,FHAD	SEE IF CYLINDER IS COMPLETE 1301	11	11222	C 16996 16821
2625		BU	LAB3	BR IF NOT	7	11233	J 10943 /
2626		MLCA	DIAGAD,16996	RESTORE FILE ADDR. TO 9#20	12	11240	D 16804 16996 T
2627		B	TSTL		7	11252	J 11289
2628	CNEED	C	16996,HALTAD	SEE IF AT TRK 385	11	11259	C 16996 16825
2629		BU	LAB3	BR IF NOT	7	11270	J 10943 /
2630		MLCA	ZEROAD&3,16996	SET FILE ADDR TO 0000	12	11277	D 16808 16996 T
2631	TSTL	B	CLEAR	GO TO CLEAR FILE AREA	7	11289	J 09854
2632		B	LFORM	GO TO SET LOAD FORMAT	7	11296	J 09911

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PGLIN     LABEL     OPCOD  OPERAND                  CT  ADDRS  INSTRUCTION
2634      LFRET     MLCS   LLL,FILEOP               SET FILE                    12  11303  D 16816 12073 3
2635                MLCS   SEVEN,FILECP&3                 OP TO                12  11315  D 16843 12076 3
2636                MLCS   WWW,FILEOP&9                       WR.FORMAT      12  11327  D 16814 12082 3
2637                B      FILEOP-7                 GO TO WR.LOAD FORMAT         7  11339  J 12066
2638                BNQ    ITR                                                   7  11346  J 01007 Q
2639                BCE    LFRET,TAD1,1             BR IF LOOP                  12  11353  B 11303 01001 1
2640      LAB4      B      CLEAR                    GO TO CLEAR FILE AREA        7  11365  J 09854
2641                MLCS   EIGHT,17001              SET HA2                     12  11372  D 16891 17001 3
2642                MLCS   EIGHT                           AT 88                6  11384  D 16891
2643                MLCS   FIVE,FILEOP&3           ALTER FILE OP TO WR HAO     12  11390  D 16842 12076 3
2644                CW     SW69                     TURN OFF 1301 ERR SW         6  11402  ¤ 12105
2645                B      FILEOP-7                 GO TO WR HA2                 7  11408  J 12066
2646                BEX1   E1301,M                  BR ANY BUT WLR               7  11415  R 12134 S
2647                BA1    *&1                                                   7  11422  R 11429 MG M
2648                SW     SW69                     TURN ON 1301 ERR SW          6  11429  , 12105
2649                B      CLEAR                    GO TO CLEAR FILE AREA        7  11435  J 09854
2650                MLCWA  ALPHAP&63,17063          MOVE ALL POSSIBLE 64 CHARS  12  11442  D 16121 17063 X
2651                MLCWS  WMGM,17064               SET WMGM                    12  11454  D 16192 17064 7
2652                MLCS   TWCS,FILEOP&3            SET FILE OP TO WR TRK       12  11466  D 01195 12076 3
2653                B      FILEOP-7                 GO TO WR TRK                 7  11478  J 12066
2654                MLCS   THREES,FILEOP&3          SET FILE OP TO RBC          12  11485  D 01207 12076 3
2655                B      FILEOP-7                                             7  11497  J 12066
2656                MLCS   TWOS,FILEOP&3            SET FILE                    12  11504  D 01195 12076 3
2657                MLCS   RRR,FILEOP&9                   OP TO READ TRK        12  11516  D 16815 12082 3
2658                C      17063,ALPHAP&63          SEE IF CORRECT DATA         11  11528  C 17063 16121
2659                BU     COMPER                   BR IF NOT                    7  11539  J 10218 /
2660                BNQ    ITR                                                   7  11546  J 01007 Q
2661                BCE    LAB4,TAD1,1              BR IF LOOP                  12  11553  B 11365 01001 1
2662                B      PASS                     BR IF NOT                    7  11565  J 11879
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PCLIN    LABEL    CPCOD  OPERAND                                                  CT  ADDRS  INSTRUCTION

2664     STEST    MLCS   99,16992          SET MODULE NUMBER IN ADDRESS           12  11572  D 00099 16992 3
2665              S      16996             RESET ADDRESS TC ZERO                   6  11584  S 16996
2666              SW     SW69              TURN ON 1301 ERROR SWITCH               6  11590  , 12105
2667              CW     SW79              TURN OFF 1311 ERROR SWITCH              6  11596  ¤ 12113
2668              MLCS   ZERO,FILEOP&3     SET FILE                               12  11602  D 16507 12076 3
2669              MLCS   RRR,FILEOP&9               OP TC SEEK                    12  11614  D 16815 12082 3
2670              B      FILEOP-7          GO TO SEEK TO 0                         7  11626  J 12066
2671              MLCS   FIVE,FILEOP&3     SET FILE OP TO RD HAO                  12  11633  D 16842 12076 3
2672              B      CLEAR             GO TO CLEAR FILE AREA                   7  11645  J 09854
2673              CW     SW69              TURN OFF ERROR SW                       6  11652  ¤ 12105
2674              B      FILEOP-7          GC TO PEFORM READ                       7  11658  J 12066
2675              BEF1   SFAIL             BR IF NOT AT 0                          7  11665  R 14113 8
2676              A      NINE60,16996        D 960 TO FILE ADDR                   11  11672  A 16846 16996
2677              MLCS   ZERO,FILEOP&3     ALTER FILE OP TC SEEK                  12  11683  D 16507 12076 3
2678              SW     SW69              TURN ON ERRCR SW                        6  11695  , 12105
2679              B      FILEOP-7          GO TO SEEK CYL 23                       7  11701  J 12066
2680              MLCS   FIVE,FILEOP&3     SET FILE OP TO RD HAO                  12  11708  D 16842 12076 3
2681              B      CLEAR             GO TO CLEAR FILE AREA                   7  11720  J 09854
2682              CW     SW69              TURN OFF ERROR SW                       6  11727  ¤ 12105
2683              B      FILEOP-7          GC TO VERIFY ADCR                       7  11733  J 12066
2684              BEF1   SFAIL             BR IF FAILED TO SEEK CORRECT ADDR       7  11740  R 14113 8
2685              A      EIGHT7,16995      ALTER ADDR TO CYLINCER 241             11  11747  A 16849 16995
2686              MLCS   ZERO,FILEOP&3     SET FILE OP TO SEEK                    12  11758  D 16507 12076 3
2687              SW     SW69              TURN ON 1301 ERROR SW                   6  11770  , 12105
2688              B      FILEOP-7          GC TO SEEK CYL.241                      7  11776  J 12066
2689              MLCS   FIVE,FILEOP&3     SET FILE OP TO RD HAO                  12  11783  D 16842 12076 3
2690              B      CLEAR             GO TO CLEAR FILE AREA                   7  11795  J 09854
2691              CW     SW69              TURN OFF 1301 ERROR SW                  6  11802  ¤ 12105
2692              B      FILEOP-7          GO TO VERIFY ADCR                       7  11808  J 12066
2693              BEF1   SFAIL             BR IF FAILED TO SEEK 241                7  11815  R 14113 8
2694              BNQ    ITR                                                       7  11822  J 01007 Q
2695              BCE    STEST,TAD1,1      BR IF IN LOOP                          12  11829  B 11572 01001 1
2696              B      PASS              BR IF NOT                               7  11841  J 11879
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PGLIN   LABEL    CPCOD  OPERAND                                                  CT  ADDRS  INSTRUCTION

2698    MARGC    MLCS   99,16992              SET MODULE NUMBER IN ADDR          12  11848  D 00099 16992 3
2699             MLCA   ZEROAD&3,16996        SET FILE ADDR TO ZERO              12  11860  D 16808 16996 T
2700             B      SW77-1                                                    7  11872  J 10758
2701    PASS     A      ONES,X15              ADD 1                              11  11879  A 01183 00099
2702             BCE    *&8,X15,0             BR IF TESTED ALL MODULES           12  11890  B 11909 00099 0
2703             B      STST01&6              BR IF NOT                           7  11902  J 10661
2704             MLNA   PASSAD,STST01&35      ALTER NEED BRNCH ADDR              12  11909  D 16830 10690 /
2705             MLNA   S01AD,STST01&23       ALTER 1301 BRNCH ADDR              12  11921  D 16840 10678 /
2706             BCE    LAB5,W01SW,1          BR IF COMPLETE THIS CHAN           12  11933  B 12036 16841 1
2707             MLCS   ONES,W01SW            TURN ON 1301 WRITE SW.             12  11945  D 01183 16841 3
2708             BCE    LAB5,MODSV,           BR IF A MOD NOT AVAIL              12  11957  B 12036 16504
2709             MLCS   CHNTS&13,*&15                                            12  11969  D 02700 11995 3
2710             B      TYP1                                                      7  11981  J 01091
2711             DCW    @SET CH. ,7631 SWS.----     INHIB ON@,G                  33  12020
2712             H                            STOP TO SET SWS                     1  12022  .
2713             SW     SW69                  TURN ON 1301 ERROR SWITCH           6  12023  , 12105
2714             B      STST01                GO TO START SEEK TEST               7  12029  J 10655
2715    LAB5     MLCS   ZERO,W01SW                                               12  12036  D 16507 16841 3
2716             SW     SW69,SW79                                                11  12048  , 12105 12113
2717             B      FILERE                RETURN TO PROGRAM                   7  12059  J 09765
2718             SBR    FOPRET&5                                                  7  12066  G 12132 B
2719    FILECP   WC     1,16989                                                  10  12073  M %F1 16989 W
2720             BCL1   OIP1                  BR IF OVERLAP IN PROCESS            7  12083  J 05067 1
2721             BCB1   *-23                                                      7  12090  R 12073 2
                                                                                                      G
2722             BA1    *&1                                                       7  12097  R 12104 M
2723             NCP                                                              1  12104  N
                                                                                                      G
2724    SW69     BA1    E1301                 BR IF 1301 ERROR                    7  12105  R 12134 M
2725             NCP                                                              1  12112  N
                                                                                                      G
2726    SW79     BA1    E1311                 BR IF 1311 ERROR                    7  12113  R 12277 M
2727             B      OLTST                 BR TO TEST OVERLAP                  7  12120  J 05211
2728    FOPRET   B      0                     RETURN TO FILE ROUTINES             7  12127  J 00000
```

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LABEL    OPCOD  OPERAND                                                    CT  ADDRS  INSTRUCTION

E1301    BCE    E1301H,TADC,1       BR IF BYPASS ERROR PRINT               12  12134  B 12257 01000 1
         B      TIND1               GO TO TEST INDICATORS                   7  12146  J 04927
         MLCA   WKA1,MES60&31       MOVE INDICATORS TO MESSAGE             12  12153  D 16774 12227 T
                                                                                                    D
         MRCWG  16991,MES60&40      MOVE FILE ADDR                         12  12165  D 16991 12236 L
         MLCA   FILEOP&9,MES60&15   MOVE FILE INSTRUCTION                  12  12177  D 12082 12211 T
         B      TYP1                                                        7  12189  J 01091
 MES60   DCW    @ 1301 M%FC16991R-IND.SET.       --ADDR            @       49  12196
         BCE    PASS,MES60&26,1     NOT RDY                                12  12245  B 11879 12222 1
E1301H   BCE    *&2,TAC2,           BR IF BYPASS ERROR HLT                 12  12257  B 12270 01002
         H                                                                  1  12269  .
         B      SW79-1                                                      7  12270  J 12112
E1311    BCE    E1311H,TADC,1       BR IF BYPASS ERROR PRINT               12  12277  B 12401 01000 1
         B      TINC1               GO TO TEST INDICATORS                   7  12289  J 04927
         MLCA   WKA1,MES61&31       MOVE INDICATORS TO MESSAGE             12  12296  D 16774 12370 T
                                                                                                    D
         MRCWG  16989,MES61&39      MOVE FILE ADDR                         12  12308  D 16989 12378 L
         MLCA   FILEOP&9,MES61&15   MOVE FILE INSTRUCTION                  12  12320  D 12082 12354 T
         B      TYP1                                                        7  12332  J 01091
 MES61   DCW    @-1311 M%FC16989W-IND.SET.        ADDR             @       50  12339
         BCE    UP,MES61&26,1       NOT RDY                                12  12389  B 12505 12365 1
E1311H   BCE    *&2,TAC2,           BR IF BYPASS ERROR HALT                12  12401  B 12414 01002
         H                                                                  1  12413  .
         B      SW79&7              RETURN TO 1311 ROUT.                    7  12414  J 12120
                                                                                                    D
F1311    MRCWG  MESAD,16989         MOVE CYL 3 ADDR                        12  12421  D 16865 16989 L
         SW     16989,16991         SET WM S IN ADDRESS                    11  12433  , 16989 16991
         MLCS   ZERO,RDYMS&14                                              12  12444  D 16507 12609 3
         SW     RDYMS&14                                                    6  12456  , 12609
         MLNS   ONES,UNITSV                                                12  12462  D 01183 16506 1
TST11    SC     1,16989             SEEK TO CYL 3                          10  12474  M %F0 16989 R
                                                                                                  G
         BA1    *&1                                                         7  12484  R 12491 M
         BNR1   *&8                 BR IF NOT AVAILABLE                     7  12491  R 12505 1
         B      HELENE              BR IF AVAIL                             7  12498  J 12576
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PGLIN   LABEL    OPCOD  OPERAND                                                      CT  ADDRS  INSTRUCTION

2762    UP       A      TWCS,16989          ADD 2 TC DRIVE NO.                       11  12505  A 01195 16989
2763             A      ONES,RDYMS&14                                                11  12516  A 01183 12609
2764             MLCB   MESAD&6,16995       MOVE CYL 3 ADDR                          12  12527  D 16871 16995 L
2765             BCE    *&8,16989,C         BR IF CHECKED ALL MCD                    12  12539  B 12558 16989 0
2766             B      TST11               GC TO TRY NEXT MODULE                     7  12551  J 12474
2767             SW     SW69,SW79                                                    11  12558  , 12105 12113
2768             B      FILERE                                                        7  12569  J 09765
2769    HELENE   MLCS   CHNTS&13,*&21                                                12  12576  D 02700 12608 3
2770             B      TYP1                                                          7  12588  J 01091
2771    RDYMS    DCW    @TST 1311 CHN-  @,G                                          15  12595
2772             B      CLEAR               GC TU CLEAR FILE AREA                     7  12611  J 09854
2773             SW     SW79                TURN 1311 ERROR SW ON                     6  12618  , 12113
2774             CW     SW69                TURN 1301 ERROR SW OFF                    6  12624  ¤ 12105
2775             MLCS   WWW,FILEOP&9        SET FILE                                 12  12630  D 16814 12082 3
2776             MLNA   ADD2,FILEOP&8                 OP TO WR                       12  12642  D 16859 12081 /
2777             MLCS   ONES,FILEOP&3                           MULTI REC.           12  12654  D 01183 12076 3
2778             MLCS   MMM,FILEOP                                        MOVE       12  12666  D 16817 12073 3
2779             SW     17000               FILL                                      6  12678  , 17000
2780             MLCWS  WMGM,19000               FILE                                12  12684  D 16192 19000 7
2781             MLCA   ALPHAP&63,18999               AREA                           12  12696  D 16121 18999 T
2782             MLCA   SAFE,18909                         WITH                      12  12708  D 16885 18909 T
2783             MLCB   18999,18899                             DATA                 12  12720  D 18999 18899 L
2784    LAB6     B      FILEOP-7            GO TO WR TRK                              7  12732  J 12066
```

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PGLIN   LABEL   OPCOD  OPERAND                                                          CT  ADDRS  INSTRUCTION

2786            MLCS   THREES,FILEOP&3     SET OP TO WDC                                12  12739  D 01207 12076 3
2787            B      FILEOP-7            GO TO WRITE CK TRK                            7  12751  J 12066
2788            MLCS   ONES,FILEOP&3       SET FILE OP TO WR.MULTI REC                  12  12758  D 01183 12076 3
2789            A      TWOS,16994          ADD 20 TO FILE ADDRESS                       11  12770  A 01195 16994
2790            C      EIGHTO,16995        SEE IF COMPLETED CYLINDER                    11  12781  C 16890 16995
2791            BU     LAB6                BR IF NOT                                     7  12792  J 12732 /
2792            BCE    LAB6,TAD1,1         BR IF LOOP                                   12  12799  B 12732 01001 1
2793            MLCB   MESAD&6,16995       RESET FILE ADDR                              12  12811  D 16871 16995 L
2794            MLCS   ONES,FILEOP&3       ALTER FILE OP                                12  12823  D 01183 12076 3
2795            MLCS   RRR,FILEOP&9                            TO RD MULTI RECORD       12  12835  D 16815 12082 3
2796    LAB7    B      FILEOP-7            GO TO READ TRK                                7  12847  J 12066
2797            A      TWOS,16994          ADD 20 TO FILE ADDRESS                       11  12854  A 01195 16994
2798            C      EIGHTO,16995        SEE IF CYL COMPLETE                          11  12865  C 16890 16995
2799            BU     LAB7                BR IF NOT                                     7  12876  J 12847 /
2800            MLCB   MESAD&6,16995       RESET FILE ADDR                              12  12883  D 16871 16995 L
2801            BCE    LAB7,TAD1,1         BR IF LOOP                                   12  12895  B 12847 01001 1
2802    LAB8    A      ONES,16994          ADD 10 TO ADDRESS                            11  12907  A 01183 16994
2803            B      FILEOP-7            GO TO CHECK HEAD SWITCHING                    7  12918  J 12066
2804            MLCB   MESAD&6,16995       RESET FILE ADDR                              12  12925  D 16871 16995 L
2805            BCE    LAB8,TAD1,1         BR IF LOOP                                   12  12937  B 12907 01001 1
2806            MLCS   WWW,FILEOP&9        SET FILE OP                                  12  12949  D 16814 12082 3
2807            MLCS   ONES,FILEOP&3                       TO WR MULTI                  12  12961  D 01183 12076 3
2808            MLCS   LLL,FILEOP                                      RECORD MOVE      12  12973  D 16816 12073 3
2809            MLCWS  WMGM,18800          FILL                                         12  12985  D 16192 18800 7
2810            MLCWA  ALPHAP&63,18799         FILE                                     12  12997  D 16121 18799 X
2811            MLCWA  SAFE,18709                  AREA                                 12  13009  D 16885 18709 X
2812            SW     17000                           LOAD                              6  13021  , 17000
2813            MLCWB  18799,18699                         MODE                         12  13027  D 18799 18699 P
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LABEL    OPCOD  CPERAND                                                CT  ADDRS  INSTRUCTION

LAB9     MLCS   ONES,FILEOP&3                                          12  13039  D 01183 12076 3
         B      FILEOP-7            GC TO WR LOAD                       7  13051  J 12066
         MLCS   THREES,FILEOP&3     SET WDC                            12  13058  D 01207 12076 3
         B      FILEOP-7            GC TO DO WDC                        7  13070  J 12066
         A      TWOS,16994          ADD 20 TO FILE ADDRESS             11  13077  A 01195 16994
         C      EIGHTO,16995        SEE CYLINDER IS COMPLETE           11  13088  C 16890 16995
         BE     *&8                 BR IF                               7  13099  J 13113 S
         B      LAB9                BR IF NOT                           7  13106  J 13039
         MLCB   MESAD&6,16995       RESET FILE ADDR                    12  13113  D 16871 16995 L
         BCE    LAB9,TAD1,1         BR IF LOOP                         12  13125  B 13039 01001 1
         BCE    LAB13,CHN1&25&X6,   BR IF NOT TEST SCAN                12  13137  B 13566 01TJ4
         BCE    LAB13,OLSW,1        BR IF OVERLAP PASS                 12  13149  B 13566 16896 1
         MLCS   LEV,SW7&7           NOP BR TO TEST OVERLAP             12  13161  D 16728 12120 3
         A      ONES,16994          ADD 10 TO FILE ADDR.               11  13173  A 01183 16994
         MLCS   FOURS,17003                                            12  13184  D 01219 17003 3
         MLCS   ONES,FILEOP&3                                          12  13196  D 01183 12076 3
         B      FILEOP-7            GO TO WR. SECTOR                    7  13208  J 12066
         MLCS   THREES,FILEOP&3                                        12  13215  D 01207 12076 3
         B      FILEOP-7            GC TO DO WDC                        7  13227  J 12066
         MLCB   MESAD&6,16995       RESET FILE ADDR                    12  13234  D 16871 16995 L
         C      TWOS,ONES           FORCE LOW INDICATOR ON             11  13246  C 01195 01183
         BL     *&2                 BR IF ON                            7  13257  J 13265 T
         H                                                              1  13264  .
         MLCS   EIGHT,FILEOP&3      SET FILE OP TO SCAN EQUAL          12  13265  D 16891 12076 3
         MLCWS  WMGM,17004                                             12  13277  D 16192 17004 7
         B      FILEOP-7            GC TO SCAN EQUAL                    7  13289  J 12066
         BE     LAB10               BR IF FIND                          7  13296  J 13357 S
         BCE    EQF,TADO,1          BR IF BYPASS PRINT ERROR           12  13303  B 13344 01000 1
```

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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2844                B      TYP1                                      7  13315  J 01091
2845                DCW    @ 1311 SCAN EQ. FAILED@,G                21  13342
2846      EQH       BCE    *&2,TAD2,          BR IF BYPASS STOP ON ERROR  12  13344  B 13357 01002
2847                H                                                1  13356  .
2848      LAB1C     MLCS   SIX,17003          SET SEARCH FOR HI.OR EQ.  12  13357  D 01980 17003 3
2849                C      TWOS,ONES          FORCE LOW INDICATOR ON   11  13369  C 01195 01183
2850                BL     *&2                BR IF ON                  7  13380  J 13388 T
2851                H                                                1  13387  .
2852                MLCS   NINE,FILEOP&3      ALTER FILE OP TO SCAN HI OR EQ  12  13388  D 16330 12076 3
2853                B      FILEOP-7           GO TO SCAN HI             7  13400  J 12066
2854                BH     LAB11              BR IF FIND                7  13407  J 13468 U
2855                BCE    HIH,TAD1,1         BR IF BYPASS ERROR PRINT  12  13414  B 13455 01001 1
2856                B      TYP1                                      7  13426  J 01091
2857                DCW    @ 1311 SCAN HI. FAILED@,G                21  13453
2858      HIH       BCE    *&2,TAD2,          BR IF BYPASS ERROR HALT   12  13455  B 13468 01002
2859                H                                                1  13467  .
2860      LAB11     MLCS   SEVEN,FILEOP&3     SET SCAN LO OR EQ        12  13468  D 16843 12076 3
2861                C      ONES,TWOS          FORCE HI INDICATOR ON    11  13480  C 01183 01195
2862                BH     *&2                BR IF ON                  7  13491  J 13499 U
2863                H                                                1  13498  .
2864                B      FILEOP-7           GO TO SCAN LO             7  13499  J 12066
2865                BL     LAB13              BR IF FIND                7  13506  J 13566 T
2866                BCE    LOH,TAD1,1         BR IF BYPASS PRINT ERROR  12  13513  B 13553 01001 1
2867                B      TYP1                                      7  13525  J 01091
2868                DCW    @ 1311 SCAN LO FAILED@,G                 20  13551
2869      LOH       BCE    *&2,TAD2,                                   12  13553  B 13566 01002
2870                H                                                1  13565  .
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PGLIN  LABEL  OPCOD  OPERAND                  CT  ADDRS  INSTRUCTION
2872   LAB13  MLCS   ZERO,FILEOP&3   ALTER FILEOP TO SEEK   12  13566  D 16507 12076 3
2873          A      ONES,16991                             11  13578  A 01183 16991
2874          MLCS   16989,MODHLD    SAVE MODULE NO.        12  13589  D 16989 16895 3
2875          MLCS   JAY,SW79&7      RESTORE BR TO TEST OVERLAP 12 13601 D 16440 12120 3
2876          B      FILEOP-7        GO TO SEEK USING FILE   7  13613  J 12066
2877          BCE    LAB12,CHN1&24&X6,  BR IF NOT SEEK OVERLAP 12 13620 B 13776 01TJ3
2878          SC     1,16989                                10  13632  M %F0 16989 R
2879          BCB1   S112                                    7  13642  R 13650 2
2880          H                                              1  13649  .
2881   S112   A      TWCS,16989                             11  13650  A 01195 16989
2882          SC     1,16989                                10  13661  M %F0 16989 R
2883          BNR1   S113                                    7  13671  R 13692 1
2884          BCB1   SOLPER                                  7  13678  R 14203 2G
2885          BA1    *&1                                     7  13685  R 13692 M
2886   S113   A      TWCS,16989                             11  13692  A 01195 16989
2887          SC     1,16989                                10  13703  M %F0 16989 R
2888          BNR1   S114                                    7  13713  R 13734 1
2889          BCB1   SOLPER                                  7  13720  R 14203 2G
2890          BA1    *&1                                     7  13727  R 13734 M
2891   S114   A      TWCS,16989                             11  13734  A 01195 16989
2892          SC     1,16989                                10  13745  M %F0 16989 R
2893          BNR1   LAB12                                   7  13755  R 13776 1
2894          BCB1   SOLPER                                  7  13762  R 14203 2G
2895          BA1    *&1                                     7  13769  R 13776 M
2896   LAB12  MLCS   MODHLD,16989    SET MOD NO TO USING FILE 12 13776  D 16895 16989 3
2897          CS     17C99                                   6  13788  / 17099
2898          MLCS   ONES,FILEOP&3                          12  13794  D 01183 12076 3
2899          MLCS   RRR,FILEOP&9                           12  13806  D 16815 12082 3
2900          CW     SW79                                    6  13818  ¤ 12113
2901          B      FILEOP-7                                7  13824  J 12066
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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2903                BEF1   SERR                                      7  13831  R 09772 8
2904                BA1    *&1                                       7  13838  R 13845 GM
2905                SW     SW79                                      6  13845  , 12113
2906                MLCA   ZEROS,16995      SET FILE ADDRESS TO 0    12  13851  D 16768 16995 T
2907                MLCS   ZERO,FILEOP&3    SET FILEOP TO SEEK       12  13863  D 16507 12076 3
2908                B      FILEOP-7         GO TO SEEK TO 0           7  13875  J 12066
2909                MLCS   CH40,16994       SET # IN ADDR FOR DIRECT SEEK 12  13882  D 16468 16994 3
2910                MLZS   SAVE-1,16993     SET PLUS                 12  13894  D 16884 16993 2
2911                MLNS   SIX,16993        SET 3 TRKS               12  13906  D 01980 16993 1
2912                B      FILEOP-7         GO TO DIR.SEEK &3          7  13918  J 12066
2913                MLCB   MESAD&6,16995    SET FILE TO 600          12  13925  D 16871 16995 L
2914                MLCS   ONES,FILEOP&3    SET FILE OP              12  13937  D 01183 12076 3
2915                MLCS   RRR,FILEOP&9                              12  13949  D 16815 12082 3
2916                CW     SW79                                      6  13961  ¤ 12113
2917                B      FILEOP-7         GO TO VERIFY ADDR         7  13967  J 12066
2918                BEF1   SERR                                      7  13974  R 09772 8
2919                BA1    *&1                                       7  13981  R 13988 GM
2920                MLCS   ZERO,FILEOP&3    SET FILE                 12  13988  D 16507 12076 3
2921                MLCS   CH40,16994             OP.TO              12  14000  D 16468 16994 3
2922                MLZS   MMM,16993                   SEEK         12  14012  D 16817 16993 2
2923                MLNS   SIX,16993                       MINUS 3  12  14024  D 01980 16993 1
2924                SW     SW79             GO TO DIRECT SEEK MINUS 3 6  14036  , 12113
2925                B      FILEOP-7                                  7  14042  J 12066
2926                MLCA   ZEROS,16995      RESET ADDRESS TO ZERO    12  14049  D 16768 16995 T
2927                MLCS   ONES,FILEOP&3                            12  14061  D 01183 12076 3
2928                CW     SW79                                      6  14073  ¤ 12113
2929                B      FILEOP-7                                  7  14079  J 12066
2930                BEF1   SERR                                      7  14086  R 09772 8
2931                BA1    *&1                                       7  14093  R 14100 GM
2932                SW     SW79                                      6  14100  , 12113
2933                B      UP                                        7  14106  J 12505
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PGLIN  LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2935   ********************************************************
2936   SFAIL   SBR    SFRET&5          STORE B FOR RETURN      7   14113  G 14201 B
2937           BCE    SFHLT,TAD0,1     BR IF BYPASS ERROR TYPE 12  14120  B 14183 01000 1
2938           MRCWG  16989,*&29                               12  14132  D 16989 14172 L D
2939           B      TYP1                                     7   14144  J 01091
2940           DCW    @FAILED TO SEEK ADDR.          @        32  14182
2941   SFHLT   BCE    *&2,TAD2,        BR IF BYPASS ERROR HALT 12  14183  B 14196 01002
2942           H                                               1   14195  .
2943   SFRET   B      0                                        7   14196  J 00000
2944   ********************************************************
2945   SOLPER  BCE    SOLHLT,TAD2,     BR IF BYPASS ERROR TYPE 12  14203  B 14268 01002
2946           B      TYP1                                     7   14215  J 01091
2947           DCW    @SEEK OVERLAP FAILED-CANT ST.2 FILES IN MOTION@,G  45  14266
2948   SOLHLT  BCE    *&2,TAD2,        BR IF BYPASS ERROR HALT 12  14268  B 14281 01002
2949           H                                               1   14280  .
2950           B      LAB12                                    7   14281  J 13776
2951   ********************************************************
2952   TERR    SBR    TX1&5                                    7   14288  G 14543 B
2953           SBR    BSPAD            STORE BAR TO LOCATE BSP 7   14295  G 16744 B
2954           BCE    TPHLT,TAD0,1     BYPASS PRINTING         12  14302  B 14525 01000 1
2955           B      TIND1            BR TO TEST INDICATORS   7   14314  J 04927
2956           MLCA   WKA1,BLOCK&28    INDICATORS TO MESSAGE   12  14321  D 16774 14487 T
2957   CPERT   MLCA   CH3S,BLOCK&9                            12  14333  D 16471 14468 T
2958           SAR    BLOCK&20         STORE A REG  OP ADDR    7   14345  G 14479 A
2959           BCE    BSPER,BLOCK&9,3  BR IF BSP ERROR         12  14352  B 14394 14468 3
2960           SW     BLOCK&16                                 6   14364  , 14475
2961           A      CNES,BLOCK&20                            11  14370  A 01183 14479
2962           CW     BLOCK&16                                 6   14381  ¤ 14475
2963           B      WRIT4                                    7   14387  J 14452
2964   BSPER   S      CON15,BSPAD      FIND LAST CHAR          11  14394  S 16746 16744
2965           MLNA   BSPAD,MOVECP&5                           12  14405  D 16744 14422 /
2966   MOVECP  MLCA   0,BLOCK&9        MOVE OP TO T/O          12  14417  D 00000 14468 T
2967           S      FOURS,BSPAD      SUB A 4                 11  14429  S 01219 16744
2968           MLNA   BSPAD,BLOCK&20   MOVE ADDR TO T/O        12  14440  D 16744 14479 /
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PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
2970      WRIT4     B      TYP1                                        7  14452  J 01091
2971       BLOCK    DCW    @            ADDR-       1248AB@,G         29  14459
2972                MLCWA  BL1&9,BLOCK&9       CLEAR OPERATION FLD    12  14489  D 17609 14468 X
2973                MLNA   CONAD,OPERT&5       RESTORE MOVE ADDR      12  14501  D 16751 14338 /
2974                BCE    UPDT1,BLOCK&23,1    BYPASS IF NOT RDY      12  14513  B 09704 14482 1
2975      TPHLT     BCE    *&2,TAD2,           BYPASS ERROR HALT      12  14525  B 14538 01002
2976      THLT      H                                                  1  14537  .
2977      TX1       B      0                                           7  14538  J 00000
2978      ************************************************************
2979      EOFERR    SBR    TX2&5                                       7  14545  G 14605 8
2980                B      TYP1                                        7  14552  J 01091
2981       UEOF     DCW    @ EXPECTED EOF NOT INDICATED@,G            27  14559
2982      EOFHLT    BCE    *&2,TAD2,           BYPASS ERROR HALT      12  14587  B 14600 01002
2983      EHLT      H                                                  1  14599  .
2984      TX2       B      0                                           7  14600  J 00000
2985      ************************************************************
2986      *      ERROR ROUTINE FOR RD TM IN ODD PARITY          *
2987      ************************************************************
2988      RTMODD    SBR    TX3&5                                       7  14607  G 14701 8
2989                BEF1   *&8                                         7  14614  R 14628 8
2990                B      *&12                                        7  14621  J 14639
2991                A      CNE4,TX3&5                                 11  14628  A 16900 14701
2992                B      TYP1                                        7  14639  J 01091
2993      NODC      DCW    @ NO DATA CHK DURING RD TM ODD PARITY@,G   36  14681
2994      TAC       BCE    *&2,TAD2,           BYPASS ERROR HALT      12  14683  B 14696 01002
2995                H                                                  1  14695  .
2996      TX3       B      0                                           7  14696  J 00000
2997      ************************************************************
2998      RTMOD1    SBR    TX4&5                                       7  14703  G 14767 8
2999                B      TYP1                                        7  14710  J 01091
3000      NOEOF     DCW    @ NO EOF DURING RD TM ODD PARITY@,G        31  14747
3001      TAG1      BCE    *&2,TAD2,           BYPASS ERROR HALT      12  14749  B 14762 01002
3002                H                                                  1  14761  .
3003      TX4       B      0                                           7  14762  J 00000
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PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
3005     **********************************************************
3006     WLR       SBR    TX5&5                                             7  14769  G 14833 B
3007               B      TYP1                                              7  14776  J 01091
3008     WLR1      DCW    @ WLR EXPECTED-WAS NOT INDICATED@,G              31  14813
3009     TAG2      BCE    *&2,TAD2,          BYPASS ERROR HALT             12  14815  B 14828 01002
3010               H                                                        1  14827  .
3011     TX5       B      0                                                 7  14828  J 00000
3012     **********************************************************
3013     FLDER     SBR    TX6&5                                             7  14835  G 14940 B
3014               MLNA   RDFLD,CERR&34      RD FLD ADDR                  12  14842  D 16497 14907 /
3015               MLNA   WRFLD,CERR&47                                    12  14854  D 16502 14920 /
3016               B      TYP1                                              7  14866  J 01091
3017      CERR     DCW    @     CMP ERROR DISPLAY-RD ADR-      WR ADR-     @,G  48  14873
3018     FLTA      BCE    *&2,TAD2,          BYPASS ERROR HALT             12  14922  B 14935 01002
3019               H                                                        1  14934  .
3020     TX6       B      0                                                 7  14935  J 00000
3021     **********************************************************
3022     *     ERROR NO WORD MARK                                 *
3023     **********************************************************
3024     NOWM      SBR    TX8&5                                             7  14942  G 15013 B
3025               B      TYP1                                              7  14949  J 01091
3026     WMAB      DCW    @ L MODE FAILED-NO WORD MARK FIRST CHAR@,G        38  14993
3027     NOWM1     BCE    *&2,TAD2,          BYPASS ERROR HALT             12  14995  B 15008 01002
3028               H                                                        1  15007  .
3029     TX8       B      0                                                 7  15008  J 00000
3030     **********************************************************
3031     * RIPPLE ROUTINE                                           *
3032     **********************************************************
3033     RIPPLE    SBR    RIP1&5                                            7  15015  G 15086 B
3034               SW     WORK&X5,WORK                                     11  15022  , 17##0 17000
3035               MLCS   WORK&X5,WORK                                     12  15033  D 17##0 17000 3
3036               MRC    DATA,WORK&1                                      12  15045  D 17200 17001 #
3037               MRC                                                     1  15057  D
3038               MLCB   WORK&X5,DATA&X5                                  12  15058  D 17##0 17S#0 L
3039               CW     WORK&X5,WORK                                     11  15070  ¤ 17##0 17000
3040     RIP1      B      0                                                 7  15081  J 00000
```

```
PGLIN     LABEL     OPCOD  OPERAND                                        CT  ADDRS  INSTRUCTION

3041                H                          DEFINE INSTRUCTION          1  15088  .
3042      ***************************************************
3043      *              DELAY ROUTINE                      *
3044      ***************************************************
3045      DELAY     SBR    DRET&5              STORE B FOR RETURN          7  15089  G 15132 B
3046                S      DCNT                RESET DELAY CNTR            6  15096  S 15137
3047                A      ONES,DCNT           ADD 1                      11  15102  A 01183 15137
3048                BZ     *&8                                             7  15113  J 15127 V
3049                B      *-24                BR IF NOT                   7  15120  J 15102
3050      DRET      B      0                   RETURN                      7  15127  J 00000
3051      DCNT      DCW    0000                                            4  15137
```

```
LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

***********************************************************
*        SET UP FOR CHANNEL 2 OPERATION                   *
***********************************************************
TWO        SBR    E165                                              7  15138  G 02914 B
           MLCS   CH2,CHCODE          ¤ TO CHAN ALTER ROUTINE      12  15145  D 16454 01977 3
           MLCA   MODE4,CHNTS&36      MODE TO T/O                  12  15157  D 16564 02723 T
           MLNS   TWOS,CHNTS&13       MOVE CHAN TO T/O             12  15169  D 01195 02700 1
           MLNS   ONES,CHANSV                                      12  15181  D 01183 16505 1
           MLCS   CH2S,CHSTAT         X TO CHAN ALTER ROUTINE      12  15193  D 16470 01978 3
           MLNA   SC1,STARAD          MOVE SCAN START ADDR         12  15205  D 16477 01966 /
           MLNA   SC1A,STOPAD         MOVE SCAN STOP ADDR          12  15217  D 16482 01971 /
           MLCS   TWOS,BOLOM                                       12  15229  D 01195 01979 3
           B      CHSTT               BR TO ALTER ROUTINE           7  15241  J 01517
           ZA     CH2K,X6             SET X6 FOR CHN 2             11  15248  M 16456 00054
           B      TUL1                BR TO START ROUTINES          7  15259  J 02673
           B      TS1                                               7  15266  J 02739
```

```
PGLIN   LABEL   OPCOD  OPERAND                                              CT  ADDRS  INSTRUCTION

3070    ****************************************************
3071    *      SET UP FOR CHAN 3 OPERATION UNOVERLAP MODE    *
3072    ****************************************************
3073    THREE   SBR    E1&5                                                  7  15273  G 02914 B
3074            MLCS   CH3,CHCODE          & TO CHAN ALTER ROUTINE          12  15280  D 16457 01977 3
3075            MLCA   MODE4,CHNTS&36      MODE                             12  15292  D 16564 02723 T
3076            MLNS   THREES,CHNTS&13     MOVE CHAN TO T/C                 12  15304  D 01207 02700 1
3077            MLNS   ONES,CHANSV                                          12  15316  D 01183 16505 1
3078            MLCS   CH3S,CHSTAT         3 TO CHAN ALTER ROUTINE          12  15328  D 16471 01978 3
3079            MLNA   SC1,STARAD          MOVE SCAN START ADDR             12  15340  D 16477 01966 /
3080            MLNA   SC1A,STOPAD         MOVE SCAN STOP ADDR              12  15352  D 16482 01971 /
3081            MLCS   THREES,BOLCM                                         12  15364  D 01207 01979 3
3082            B      CHSTT               BR TO ALTER CHAN ROUTINE          7  15376  J 01517
                                                                                       Q
3083            ZA     CH3K,X6             SET X6 FOR CHN 3                 11  15383  M 16460 00054
3084            B      TUL1                BR TO START ROUTINES              7  15394  J 02673
3085            B      TS1                                                   7  15401  J 02739
```

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

3087     ***************************************************************
3088     *     SET UP FOR CHAN 4 OPERATION UNOVERLAP MODE              *
3089     ***************************************************************
3090     FOUR      SBR    E1&5                                              7  15408  G 02914 B
3091               MLCA   MODE4,CHNTS&36        MODE TO T/O                12  15415  D 16564 02723 T
3092               MLCS   CH4,CHCODE            - TO CHAN ALTER ROUTINE    12  15427  D 16461 01977 3
3093               MLNS   FOURS,CHNTS&13        MOVE CHAN TC T/O           12  15439  D 01219 02700 1
3094               MLCS   ONES,CHSTAT           1 TO CHAN ALTER ROUTINE    12  15451  D 01183 01978 3
3095               MLNA   SC1,STARAD            MOVE SCAN START ADDR       12  15463  D 16477 01966 /
3096               MLNA   SC1A,STOPAD           MOVE SCAN STOP ADDR        12  15475  D 16482 01971 /
3097               MLCS   FOURS,BOLOM                                      12  15487  D 01219 01979 3
3098               B      CHSTT                                             7  15499  J 01517
                                                                                        Q
3099               ZA     CH4K,X6               SET X6 FOR CHN 4           11  15506  M 16464 00054
3100               B      TUL1                  BR TO START ROUTINES        7  15517  J 02673
3101               B      TS1                                               7  15524  J 02739
```

```
PGLIN   LABEL    OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

3103    ************************************************************
3104    *     SET UP FOR OVERLAP OPERATION                         *
3105    ************************************************************
3106    CLAP     SBR    LAB34&5                                     7  15531  G 15727 B
3107             MLCS   ONES,OLSW          TURN ON OVERLAP SWT     12  15538  D 01183 16896 3
3108             MLNS   ONES,MODESV                                12  15550  D 01183 16503 1
3109             MLCS   WTAPE0&13,CREG1    SET OP TO G             12  15562  D 15935 07365 3
3110             MLCS   WTAPE0&9,CREG1&6   SET D-MOD TO E          12  15574  D 15931 07371 3
3111             CW     LAB30&1            SET BAR                  6  15586  ¤ 15612
3112             SBR    E1&5               STORE RETURN ADDR.       7  15592  G 02914 B
3113             BCE    LAB35,SYS1&12,1    BR IF CHAN 1 AVAILABLE  12  15599  B 15729 01268 1
3114    LAB30    CW     LAB31&1            SET BAR                  6  15611  ¤ 15649
3115             SBR    E1&5               STORE RETURN ADDR.       7  15617  G 02914 B
3116             MLCS   RMOD2,CREG1&6      SET D-MOD TO F          12  15624  D 16588 07371 3
3117             BCE    LAB36,SYS1&13,1    BR IF CHAN 2 AVAILABLE  12  15636  B 15760 01269 1
3118    LAB31    CW     LAB32&1            SET BAR                  6  15648  ¤ 15686
3119             SBR    E1&5               STORE RETURN ADDR.       7  15654  G 02914 B
3120             MLCS   RMOD3,CREG1&6      SET D-MOD TO G          12  15661  D 16589 07371 3
3121             BCE    LAB37,SYS1&14,1    BR IF CHAN 3 AVAILABLE  12  15673  B 15791 01270 1
3122    LAB32    CW     LAB34&1            SET BAR                  6  15685  ¤ 15723
3123             SBR    E1&5               STORE RETURN ADDR.       7  15691  G 02914 B
3124             MLCS   RMOD4,CREG1&6      SET D- MOD TO H         12  15698  D 16590 07371 3
3125             BCE    LAB38,SYS1&15,1    BR IF CHAN 4 AVAILABLE  12  15710  B 15822 01271 1
3126    LAB34    B      0                                           7  15722  J 00000
3127    LAB35    MLCA   MODE2,CHNTS&36     MOVE MODE TO T/O        12  15729  D 16540 02723 T
3128             MLCS   CH10,CHCODE        @ TO CHAN ALTER ROUTINE 12  15741  D 16465 01977 3
3129             B      CONE&31            GO TO CONTINUE CHAN 1 SETUP  7  15753  J 02574
3130    LAB36    MLCA   MODE2,CHNTS&36     MOVE MODE TO T/O        12  15760  D 16540 02723 T
3131             MLCS   CH20,CHCODE        MOVE MODE TO T/O        12  15772  D 16466 01977 3
3132             B      TWO&31             GO TO CONTINUE CHAN 2 SETUP  7  15784  J 15169
3133    LAB37    MLCA   MODE2,CHNTS&36     MOVE MODE TO T/O        12  15791  D 16540 02723 T
3134             MLCS   CH30,CHCODE        $ TO CHAN ALTER ROUTINE 12  15803  D 16467 01977 3
3135             B      THREE&31           GO TO CONTINUE CHAN 3 SETUP  7  15815  J 15304
3136    LAB38    MLCA   MODE2,CHNTS&36     MOVE MODE TO T/O        12  15822  D 16540 02723 T
3137             MLCS   CH40,CHCODE        # TO CHAN ALTER ROUTINE 12  15834  D 16468 01977 3
3138             B      FOUR&31            GO TO CONTINUE CHAN 4 SETUP  7  15846  J 15439
```

```
PGLIN   LABEL    OPCOD  OPERAND                                                    CT  ADDRS  INSTRUCTION

3139    ************************************************************
3140    *                CCNSTANTS                                 *
3141    ************************************************************
3142             DCW    @9@,G                                                      1  15853
3143    TTYPE1   DCW    @ @                        CONSOLE PRINTER WRITE FIELD      1  15855
                            LLG
3144             DCW    @.□BTM&$*@                 64 CHARACTERS                    8  15863
                          R.D    WBS
3145             DCW    @B,L-/,%SSM@                                               10  15873
                          S  .GTQ
3146             DCW    @B#@.TMMABC@                                               10  15883
3147             DCW    @DEFGHI.JKL@                                               10  15893
3148             DCW    @MNOPQR*STU@                                               10  15903
3149             DCW    @VWXYZ01234@                                               10  15913
3150             DCW    @56789@,G                                                   5  15918
3151    TEST1           @ @,G                      SPACE CONSOLE PRINTER            1  15920
                                                        L L G
3152    WTAPEO   DCW    @1A2B3C4D5E6F7G8H9I0.J□KBLTMMN&0$P@ TAPE WRITE AND         33  15922
                          R . D          B S      . G Q .
3153             DC     @*LBR,SLT-L/V,W%XSYMZ 1#2.3T4M5.6Z@ COMPARE FIELD          33  15987
                                 L G L      R . D
3154             DC     @7A8B9C0C.E□FBGMHTI&J$K*LBM,NLO-P/@ 132 CHAR RECORD        33  16020
                         . D          B S    .     L L G
3155             DC     @Q,RLS-T/U,V%WSXMY#Z.A.B□CBDTEMF&G@,G                      33  16053
                         ST
3156    WTAPEE   DC     @RM@,G                                                      2  16055
3157    ALPHAP   DCW    @ABCDEFGHIJKLMNOPQRSTUVWXY@         ALPHA CHAIN            25  16058
3158             DC     @7C123456789&,.□-$*/%#@* A@         WRITE FIELD            25  16107
3159             DC     @BCDEFGHIJKLMNOPQRSTUVWXYZ@         132 OR 100 CHAR        25  16132
                                                S
3160             DC     @0123456789&,.□-$*/%#@B AB@                                25  16157
3161             DC     @CDEFGHIJKLMNOPQRSTUVWXYZ01234567@,G                       32  16189
3162    ANA      DCW    @A@                        TC RESET FIELD                   1  16191
                         G
3163    WMGM     DCW    @M@                        WCRD MARK GRCUP MARK             1  16192
3164    PCTR     DCW    @00000@                    LINE CTR                         5  16197
3165    NUMERP   DCW    @0123456789$.,*-□012345678@ NUMERIC CHAIN                  25  16198
3166             DC     @9$.,*-□0123456789$.,*-□01@ 132 OR 100 CHARS               25  16247
3167             DC     @23456789$.,*-□0123456789$@                                25  16272
3168             DC     @.,*-□0123456789$.,*-□0123@                                25  16297
3169             DC     @456789$.,*-□0123456789$.,*-□0123@                         32  16329
3170    NINE     DCW    @9@                        RESET NUMERIC FIELD              1  16330
3171    PUCTR    DCW    @00000@                    PUNCH CTR                        5  16335
                           LLG    R.D      WBSS  .GTC
3172    FIELC    DCW    @ .□BTM&$*B,L-/,%SSMB#@.TMMABCDEFG@  80 CHAR FIELD         33  16336
3173             DC     @HI.JKLMNOPQR*STUVWXYZ0123456789 .@                        33  16401
                           LLG    R.C
3174             DC     @□BTM&$*B,L-/,%@,G                                         14  16415
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
3175	TPTBL	DCW	@ @		1	16417	
3176		DCW	@ @		1	16418	
3177		DCW	@ @		1	16419	
3178		DCW	@ @		1	16420	
3179		DCW	@ @		1	16421	
3180		DCW	@ @		1	16422	
3181		DCW	@ @		1	16423	
3182		DCW	@ @		1	16424	
3183		DCW	@ @		1	16425	
3184		DCW	@ @		1	16426	
3185		DCW	@ @		1	16427	
3186		DCW	@ @		1	16428	
3187		DCW	@ @		1	16429	
3188		DCW	@ @		1	16430	
3189		DCW	@ @		1	16431	
3190		DCW	@ @		1	16432	
3191		DCW	@ @		1	16433	
3192		DCW	@ @		1	16434	
3193		DCW	@ @		1	16435	
3194		DCW	@ @		1	16436	
3195		DCW	@ @		1	16437	
3196		DCW	@ @		1	16438	
3197		DCW	@M@		1	16439	
3198	JAY	DCW	@JC2000 @,G		7	16440	
3199	TPADR	DCW	TPTBL	TAPE TBL ADDR	5	16452	16417
3200	CH1	DCW	@%@	CH1 NON OVERLAP-X CONTROL FLD	1	16453	
3201	CH2	DCW	@&@	CH2 NON OVERLAP-X CONTROL FLD	1	16454	
3202	CH2K	DCW	57		2	16456	
3203	CH3	DCW	@M@	CH3 NON OVERLAP-X CONTROL FLD	1	16457	
3204	CH3K	DCW	114		3	16460	
3205	CH4	DCW	@.@	CH4 NON OVERLAP-X CONTROL FLD	1	16461	
3206	CH4K	DCW	171		3	16464	
3207	CH10	DCW	@@@	CH1 OVERLAP-X CONTROL FLD	1	16465	
3208	CH20	DCW	@*@	CH2 OVERLAP-X CONTROL FLD	1	16466	
3209	CH30	DCW	@$@	CH3 OVERLAP-X CONTROL FLD	1	16467	
3210	CH40	DCW	@#@	CH4 OVERLAP-X CONTROL FLD	1	16468	

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
3211	CH1S	DCW	@R@	CH1 CHAN STATUS OP	1	16469	
3212	CH2S	DCW	@X@	CH2 CHAN STATUS OP	1	16470	
3213	CH3S	DCW	@3@	CH3 CHAN STATUS OP	1	16471	
3214	CH4S	DCW	@1@	CH4 CHAN STATUS OP	1	16472	
3215	SC1	DCW	TX8		5	16477	15008
3216	SC1A	DCW	PUNCH	STOP SCAN ADDR CH 1 UNOVERLAP	5	16482	02916
3217	BL1ACD	DCW	BL1A	STOP SCAN ADDR-TP	5	16487	05864
3218	UPDTAD	DCW	UPDT1	START SCAN ADDR-TP	5	16492	09704
3219	RDFLC	DCW	TREAD	TP RD FLD ADDR	5	16497	17400
3220	WRFLC	DCW	WTAPE0	TP WR FLD ADDR	5	16502	15922
3221	MODESV	DCW	@ @		1	16503	
3222	MODSV	DCW	@ @		1	16504	
3223	CHANSV	DCW	@ @		1	16505	
3224	UNITSV	DCW	@ @		1	16506	
3225	ZERO	DCW	@0@		1	16507	
3226	EIGHTY	DCW	@0C080@		5	16512	
3227	REST	DCW	RESET1		5	16517	05459
3228	MODE2	DCW	@ OVERLAP MODE @,G		23	16540	
3229	MODE4	DCW	@ UNOVERLAP MODE @,G		23	16564	
3230	REA1	DCW	REA		5	16570	03504
3231	PNC1	DCW	PNC		5	16575	02935
3232	CHAIN1	DCW	CHAIN		5	16580	04142
3233	TYAC	DCW	TYPE		5	16585	19550
3234	STORE	DCW	@ @	CHANNEL STATUS STORED HERE	1	16586	
3235	RMCD1	DCW	@E@	RESET MODIFIER-STORE CHAN-1	1	16587	
3236	RMCD2	DCW	@F@	RESET MODIFIER-STORE CHAN-2	1	16588	
3237	RMOD3	DCW	@G@	RESET MODIFIER-STORE CHAN-3	1	16589	
3238	RMCD4	DCW	@H@	RESET MODIFIER-STORE CHAN-4	1	16590	
3239	PNTER1	DCW	CHN1&17		5	16595	01306
3240	PNTER2	DCW	CHN2&17		5	16600	01363
3241	PNTER3	DCW	CHN3&17		5	16605	01420
3242	PNTER4	DCW	CHN4&17		5	16610	01477
3243	C1PTR	DCW	SYS1&3		5	16615	01259
3244	C2PTR	DCW	SYS1&4		5	16620	01260
3245	C3PTR	DCW	SYS1&5		5	16625	01261
3246	C4PTR	DCW	SYS1&6		5	16630	01262

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PGLIN   LABEL    OPCOD OPERAND                                            CT  ADDRS  INSTRUCTION

3247    PUBC1    DCW   CHN1&15                                             5  16635  01304
3248    PUBC2    DCW   CHN2&15                                             5  16640  01361
3249    PUBC3    DCW   CHN3&15                                             5  16645  01418
3250    PUBC4    DCW   CHN4&15                                             5  16650  01475
3251    RB1      DCW   CHN1&13                                             5  16655  01302
3252    RB2      DCW   CHN2&13                                             5  16660  01359
3253    RB3      DCW   CHN3&13                                             5  16665  01416
3254    RB4      DCW   CHN4&13                                             5  16670  01473
3255    RBA      DCW   CHN1&12                                             5  16675  01301
3256    RBB      DCW   CHN2&12                                             5  16680  01358
3257    MEMSZ    DCW   @09999@                                             5  16685
3258    CWCWM    DCW   @0C000@         CMP ADDR WR END MEM WO /WM          5  16690
3259    RDENC    DCW   @00000@         ADDR AT END OF WR END MEM           5  16695
3260    MEV      DCW   @M MODE EVEN@                                      11  16706
3261    MOD      DCW   @M MODE ODD @                                      11  16717
3262    LEV      DCW   @L MODE EVEN@                                      11  16728
3263    LOD      DCW   @L MODE ODD @                                      11  16739
3264    BSPAC    DCW   @00000@                                             5  16744
3265    CON15    DCW   @15@                                                2  16746
3266    CONAC    DCW   CH3S                                                5  16751  16471
3267    INDMES   DCW   @1248BA@                                            6  16757
3268    ACCUM          00C00                                               5  16762
3269    CIPSW    DC    0                                                   1  16763
3270    ZEROS    DCW   00C00                                               5  16768
3271    WKA1           000000                                              6  16774
3272    SEVEN9   DCW   @0C079@                                             5  16779
3273    ONE31    DCW   @0C131@                                             5  16784
3274    NINTY9   DCW   @00099@                                             5  16789
3275     SPCX    DCW   @1111111111@,G                                     10  16790
3276    DIAGAD   DCW   @9#20@                                              4  16804
3277     ZERCAD  DCW   @0C000088@,G                                        8  16805
3278    WWW      DCW   @W@                                                 1  16814
3279    RRR      DCW   @R@                                                 1  16815
3280    LLL      DCW   @L@                                                 1  16816
3281    MMM      DCW   @M@                                                 1  16817
3282    FHAD     DCW   @9#60@                                              4  16821
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
3283	FALTAD	DCW	0385	4	16825	
3284	PASSAD	DCW	PASS	5	16830	11879
3285	JIMAD	DCW	JIM	5	16835	10698
3286	SO1AD	DCW	STEST	5	16840	11572
3287	WO1SW	DCW	0	1	16841	
3288	FIVE	DCW	5	1	16842	
3289	SEVEN	DCW	7	1	16843	
3290	NINE60	DCW	96C	3	16846	
3291	EIGHT7	DCW	872	3	16849	
3292	ADD1	DCW	16991	5	16854	
3293	ADD2	DCW	16989	5	16859	
3294	MARGAD	DCW	MARGO	5	16864	11848
3295	MESAD	DCW	@0C0060CC20@,G	10	16865	
3296	SAFE	DCW	@1311RAMPAC@	10	16885	
3297	EIGHTO	DCW	00800	5	16890	
3298	EIGHT	DCW	8	1	16891	
3299	DOLLAR	DCW	@$$$@	3	16894	
3300	MODHLD	DCW	0	1	16895	
3301	CLSW	DCW	C	1	16896	
3302	ECFCNT	DCW	0	1	16897	
3303	BCNT	DCW	0	1	16898	
3304	CNE4	DCW	14	2	16900	
3305	CTR1	DCW	0000000	7	16907	
3306	CTR2	DCW	0000000	7	16914	
3307	RDR1	DCW	@1402@	4	16918	
3308	RDR2	DCW	@1442@	4	16922	

```
LABEL     OPCOD  OPERAND                                       CT  ADDRS  INSTRUCTION

**********************************************************
*      TEST STORE RESTORE CHANNEL STATUS                 *
**********************************************************
          ORG    18CC0                                             18000
INIT      SBR    E1165                                          7  18000  G 19198 B
          CW     SWITCH                                         6  18007  ¤ 02086
          WCP    NUMBR              IDENT                      10  18013  M %TO 01250 W
          BCB1   *-16                                           7  18023  R 18013 2
                                                                                  G
          BA1    *&1                                            7  18030  R 18037 M
MACH      BCE    MTYPE,SYS1,0       1410                       12  18037  B 02093 01256 0
          BCE    MTYPE,SYS1,I       1410I                      12  18049  B 02093 01256 I
TXX       NOPWM                                                 1  18061  N
          B      TXX2                                           7  18062  J 18229
          BCE    *&8,SYS1&7,1       OVERLAP AVAILABLE          12  18069  B 18088 01263 1
          B      TXX2               BYPASS                      7  18081  J 18229
          BCE    *&8,SYS1,X         7010                       12  18088  B 18107 01256 X
          B      TXX2               BYPASS                      7  18100  J 18229
          SW     TXX&1                                          6  18107  , 18062
TXX1      WCPO   TTYPE1                                        10  18113  M @TO 15855 W
          BCL1   *&8                                            7  18123  J 18137 1
                                                                                  G
          BA1    TXX1                                           7  18130  R 18113 M
          DCW    @$@                                            1  18137
          DC     00C13                                          5  18142
          DC     @E@                                            1  18143
          BCL1   *&8                                            7  18144  J 18158 1
          B      TXX2                                           7  18151  J 18229
          B      TYP1                                           7  18158  J 01091
          DCW    @STORE CH-STATUS-DID NOT COMPUTE DISABLE@,    39  18203
          BCE    *&2,TAD2,          BYPASS HLT                 12  18204  B 18217 01002
          H                                                     1  18216  .
          BCE    TXX1,TAD1,1        REPEAT ROUTINE             12  18217  B 18113 01001 1
TXX2      NOPWM                                                 1  18229  N
TSTOR1    B      FRSETH&18                                      7  18230  J 18461
                                                                                  G
          BA1    *&1                                            7  18237  R 18244 M
          DCW    @$@                RESTORE ALL INDICATORS OFF  1  18244
          DC     MODE2                                          5  18249  16540
```

```
PGLIN     LABEL     OPCOD  OPERAND

3346                DC     1
3347                BNR1   FRSETH
3348                BCB1   FRSETH
3349                BER1   FRSETH
3350                BEF1   FRSETH
3351                BNT1   FRSETH
3352                BWL1   FRSETH
3353                DCW    @$@
3354                DC     WMGM
3355                DC     1
3356                DCW    @$@
3357                DC     00008
3358                DC     @E@
3359                BNR1   *-2
3360                H
3361                BCB1   *-2
3362                H
3363                BER1   *-2
3364                H
3365                BEF1   *-2
3366                H
3367                BNT1   *-2
3368                H
3369                BWL1   *-2
3370                H
3371                BCE    *-2,8,M
3372                H
3373                BW     *-2,8
3374                H
3375                DCW    @$@
3376                DC     MODE2
3377                DC     1
3378                BNR1   FRSETH
3379                BCB1   FRSETH
3380                BER1   FRSETH
3381                BEF1   FRSETH
```

```
TEST
    ALL
       INDICATORS
                OFF
                   CHAN1

RESTORE ALL INDICATORS ON

STORE ALL INDICATORS IN LOC.8

TEST
    FOR
       ALL
          INDICATORS
                   ON
                      CHAN 1

VERIFY ALL
          INDICATORS STORED

RESTORE ALL INDICATORS OFF

TEST
    ALL
       INDICATORS
                OFF
```

```
CT  ADDRS  INSTRUCTION

 1  18250
 7  18251  R 18443 1
 7  18258  R 18443 2
 7  18265  R 18443 4
 7  18272  R 18443 8
 7  18279  R 18443 B
 7  18286  R 18443 -
 1  18293
 5  18298  16192
 1  18299
 1  18300
 5  18305
 1  18306
 7  18307  R 18315 1
 1  18314  .
 7  18315  R 18323 2
 1  18322  .
 7  18323  R 18331 4
 1  18330  .
 7  18331  R 18339 8
 1  18338  .
 7  18339  R 18347 B
 1  18346  .
 7  18347  R 18355 -
 1  18354  .
12  18355  B 18368 00008 M
 1  18367  .
12  18368  V 18381 00008 1
 1  18380  .
 1  18381
 5  18386  16540
 1  18387
 7  18388  R 18443 1
 7  18395  R 18443 2
 7  18402  R 18443 4
 7  18409  R 18443 8
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
3382                BNT1   FRSETH                          CHAN 1           7  18416  R 18443 S B
3383                BWL1   FRSETH                                           7  18423  R 18443 -
3384                SW     TSTOR1           SET BYPASS                      6  18430  , 18230
3385                B      *&7              GO TO CONTINUE PROGRAM          7  18436  J 18449
3386      FRSETH    H      TSTOR1&7         ERROR HALT -- INDICATOR NOT OFF 6  18443  . 18237
3387                BCE    TSTOR1&7,IAD1,1  REPEAT ROUTINE                 12  18449  B 18237 01001 1
3388                NOPWM                                                   1  18461  N
3389      TSTOR2    B      FR2H&18                                          7  18462  J 18705
3390                BCE    TSTOR3-1,SYS1&13,   CHAN 2 NOT AVAIL            12  18469  B 18705 01269
3391                BA2    *&1                                              7  18481  X 18488 G M
3392                DCW    @$@                                              1  18488
3393                DC     MODE2                                            5  18493  16540
3394                DC     2                                                1  18494
3395                BNR2   FR2H             TEST                            7  18495  X 18687 1
3396                BCB2   FR2H                 ALL                         7  18502  X 18687 2
3397                BER2   FR2H                    INDICATORS               7  18509  X 18687 4
3398                BEF2   FR2H                              OFF             7  18516  X 18687 8
3399                BNT2   FR2H                                 CHAN 2       7  18523  X 18687 S B
3400                BWL2   FR2H                                              7  18530  X 18687 -
3401                DCW    @$@              RESTORE ALL INDICATORS ON       1  18537
3402                DC     WMGM                                             5  18542  16192
3403                DC     2                                                1  18543
3404                DCW    @$@              STORE ALL INDICATORS IN LOC.9   1  18544
3405                DC     00009                                            5  18549
3406                DC     @F@                                              1  18550
3407                BNR2   *&2              TEST                            7  18551  X 18559 1
3408                H                                                       1  18558  .
3409                BCB2   *&2                  FOR                         7  18559  X 18567 2
3410                H                                                       1  18566  .
3411                BER2   *&2                      ALL                     7  18567  X 18575 4
3412                H                                                       1  18574  .
3413                BEF2   *&2                          INDICATORS          7  18575  X 18583 8
3414                H                                                       1  18582  .
3415                BNT2   *&2                                  ON          7  18583  X 18591 S B
3416                H                                                       1  18590  .
3417                BWL2   *&2                                    CHAN 2    7  18591  X 18599 -
```

```
PGLIN    LABEL    OPCOD  OPERAND                                                      CT  ADDRS  INSTRUCTION

3418              H                                                                    1  18598  .
                                   G                                                                          G
3419              BCE    *&2,9,M             VERIFY ALL                               12  18599  B 18612 00009 M
3420              H                                                                    1  18611  .
3421              BW     *&2,9                        INDICATORS STORED               12  18612  V 18625 00009 1
3422              H                                                                    1  18624  .
3423              DCW    @$@                 RESTORE ALL INDICATORS OFF                1  18625
3424              DC     MODF2                                                         5  18630  16540
3425              DC     2                                                             1  18631
3426              BNR2   FR2H&6              TEST                                      7  18632  X 18693 1
3427              BCB2   FR2H&6                  ALL                                   7  18639  X 18693 2
3428              BER2   FR2H&6                     INDICATORS                         7  18646  X 18693 4
3429              BEF2   FR2H&6                      OFF                               7  18653  X 18693 8
                                                                                                          S
3430              BNT2   FR2H&6                                 CHAN 2                 7  18660  X 18693 B
3431              BWL2   FR2H&6                                                        7  18667  X 18693 -
3432              SW     TSTOR2              SET BYPASS                                6  18674  , 18462
3433              B      *&7                 GO TO CONTINUE PROGRAM                    7  18680  J 18693
3434     FR2H     H      TSTOR2&7            ERROR HALT ---CHAN 2 IND NOT OFF          6  18687  . 18469
3435              BCE    TSTOR2&7,TAD1,1      REPEAT ROUTINE                          12  18693  B 18469 01001 1
3436              NOPWM                                                                1  18705  N
3437     TSTOR3   B      FR3H&18                                                       7  18706  J 18949
3438              BCE    TSTOR4-1,SYS1&14,                                            12  18713  B 18949 01270
3439              DCW    3                                                             1  18725
3440              DC     CH3RES                                                        5  18730  18732
                          G
3441              DC     @M@                                                           1  18731
3442     CH3RES   DCW    @$@                                                           1  18732
3443              DC     MODE2                                                         5  18737  16540
3444              DC     3                                                             1  18738
3445              DCW    3                                                             1  18739
3446              DC     FR3H                                                          5  18744  18931
3447              DC     1                                                             1  18745
3448              DCW    3                                                             1  18746
3449              DC     FR3H                                                          5  18751  18931
3450              DC     2                                                             1  18752
3451              DCW    3                                                             1  18753
3452              DC     FR3H                                                          5  18758  18931
3453              DC     4                                                             1  18759
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
3454		DCW	3	1	18760	
3455		DC	FR3H	5	18765	18931
3456		DC	8	1	18766	
3457		DCW	3	1	18767	
3458		DC	FR3H	5	18772	18931
3459		DC	@B@	1	18773	
3460		DCW	3	1	18774	
3461		DC	FR3H	5	18779	18931
3462		DC	@-@	1	18780	
3463		DCW	@$@	1	18781	
3464		DC	WMGM	5	18786	16192
3465		DC	3	1	18787	
3466		DCW	@$@	1	18788	
3467		DC	00C10	5	18793	
3468		DC	@G@	1	18794	
3469		DCW	3	1	18795	
3470		DC	C3B	5	18800	18803
3471		DC	1	1	18801	
3472		H		1	18802	.
3473	C3B	DCW	3	1	18803	
3474		DC	C3E	5	18808	18811
3475		DC	2	1	18809	
3476		H		1	18810	.
3477	C3E	DCW	3	1	18811	
3478		DC	C3F	5	18816	18819
3479		DC	4	1	18817	
3480		H		1	18818	.
3481	C3F	DCW	3	1	18819	
3482		DC	C3G	5	18824	18827
3483		DC	8	1	18825	
3484		H		1	18826	.
3485	C3G	DCW	3	1	18827	
3486		DC	C3H	5	18832	18835
3487		DC	@B@	1	18833	
3488		H		1	18834	.
3489	C3H	DCW	3	1	18835	

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PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
3490                DC     C3I                               5  18840  18843
3491                DC     @-@                               1  18841
3492                H                                        1  18842  .
3493      C3I       BCE    *&2,10,GM                        12  18843  B 18856 00010 GM
3494                H                                        1  18855  .
3495                BW     *&2,10                           12  18856  V 18869 00010 1
3496                H                                        1  18868  .
3497                DCW    @$@                               1  18869
3498                DC     MODE2                             5  18874  16540
3499                DC     3                                 1  18875
3500                DCW    3                                 1  18876
3501                DC     FR3H                              5  18881  18931
3502                DC     1                                 1  18882
3503                DCW    3                                 1  18883
3504                DC     FR3H                              5  18888  18931
3505                DC     2                                 1  18889
3506                DCW    3                                 1  18890
3507                DC     FR3H                              5  18895  18931
3508                DC     4                                 1  18896
3509                DCW    3                                 1  18897
3510                DC     FR3H                              5  18902  18931
3511                DC     8                                 1  18903
3512                DCW    3                                 1  18904
3513                DC     FR3H                              5  18909  18931
3514                DC     @S8@                              1  18910
3515                DCW    3                                 1  18911
3516                DC     FR3H                              5  18916  18931
3517                DC     @-@                               1  18917
3518                SW     TSTOR3                            6  18918  , 18706
3519                B      *&7                               7  18924  J 18937
3520      FR3H      H      TSTOR3&7                          6  18931  . 18713
3521                BCE    TSTOR3&7,TAD1,1    REPEAT ROUTINE 12  18937  B 18713 01001 1
3522                NOPWM                                    1  18949  N
3523      TSTOR4    B      FR4H&18                           7  18950  J 19193
3524                BCE    MODE,SYS1&15,                    12  18957  B 02134 01271
3525                DCW    1                                 1  18969
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
3526		DC	CH4RES	5	18974	18976
3527		DC	@G@	1	18975	
3528	CH4RES	DCW	@$@	1	18976	
3529		DC	MODE2	5	18981	16540
3530		DC	4	1	18982	
3531		DCW	1	1	18983	
3532		DC	FR4H	5	18988	19175
3533		DC	1	1	18989	
3534		DCW	1	1	18990	
3535		DC	FR4H	5	18995	19175
3536		DC	2	1	18996	
3537		DCW	1	1	18997	
3538		DC	FR4H	5	19002	19175
3539		DC	4	1	19003	
3540		DCW	1	1	19004	
3541		DC	FR4H	5	19009	19175
3542		DC	8	1	19010	
3543		DCW	1	1	19011	
3544		DC	FR4H	5	19016	19175
3545		DC	@S@	1	19017	
3546		DCW	1	1	19018	
3547		DC	FR4H	5	19023	19175
3548		DC	@-@	1	19024	
3549		DCW	@$@	1	19025	
3550		DC	WMGM	5	19030	16192
3551		DC	4	1	19031	
3552		DCW	@$@	1	19032	
3553		DC	00011	5	19037	
3554		DC	@H@	1	19038	
3555		DCW	1	1	19039	
3556		DC	C4B	5	19044	19047
3557		DC	1	1	19045	
3558		P		1	19046	.
3559	C4B	DCW	1	1	19047	
3560		DC	C4C	5	19052	19055
3561		DC	2	1	19053	

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
3562		H		1	19054	.
3563	C4C	DCW	1	1	19055	
3564		DC	C4C	5	19060	19063
3565		DC	4	1	19061	
3566		H		1	19062	.
3567	C4D	DCW	1	1	19063	
3568		DC	C4E	5	19068	19071
3569		DC	8	1	19069	
3570		H		1	19070	.
3571	C4E	DCW	1	1	19071	
3572		DC	C4F	5	19076	19079
3573		DC	@B@	1	19077	
3574		H		1	19078	.
3575	C4F	DCW	1	1	19079	
3576		DC	C4G	5	19084	19087
3577		DC	@-@	1	19085	
3578		H		1	19086	.
3579	C4G	BCE	*&2,11,M	1	19087	B 19100 00011 M
3580		H			19099	.
3581		BW	*&2,11	12	19100	V 19113 00011 1
3582		H		1	19112	.
3583		DCW	@$@	1	19113	
3584		DC	MODE2	5	19118	16540
3585		DC	4	1	19119	
3586		DCW	1	1	19120	
3587		DC	FR4H	5	19125	19175
3588		DC	1	1	19126	
3589		DCW	1	1	19127	
3590		DC	FR4H	5	19132	19175
3591		DC	2	1	19133	
3592		DCW	1	1	19134	
3593		DC	FR4H	5	19139	19175
3594		DC	4	1	19140	
3595		DCW	1	1	19141	
3596		DC	FR4H	5	19146	19175
3597		DC	8	1	19147	

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
3598		DCW	1		1	19148	
3599		DC	FR4H		5	19153	19175
3600		DC	â$Bâ		1	19154	
3601		DCW	1		1	19155	
3602		DC	FR4H		5	19160	19175
3603		DC	â-â		1	19161	
3604		SW	TSTOR4		6	19162	, 18950
3605		B	*&7		7	19168	J 19181
3606	FR4H	H	TSTOR4&7		6	19175	. 18957
3607		BCE	TSTOR4&7,TAD1,1	REPEAT ROUTINE	12	19181	B 18957 01001 1
3608	E11	B	0		7	19193	J 00000
3609		H			1	19200	.

```
PGLIN   LABEL   CPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

3611    ****************************************************
3612    *        TYPEWRITER TEST  VISUAL COMPARE             *
3613    ****************************************************
3614            ORG    19500                                                 19500
3615    TYWR    SBR    E265                                              7   19500  G 19662 B
3616            MLNA   TYAD,6          TYPE ROUTINE ADDR TO RESTART     12   19507  D 16585 00006 /
3617            MLNS   CNES,UNITSV                                      12   19519  D C1183 16506 1
3618            BCE    E2,SYS1&12,     BYPASS IF NOT 1                  12   19531  B 19657 01268
                                                                                               G
3619            BA1    *&1                                               7   19543  R 19550 M
3620    TYPE    WCPW   TTYPE1          LOAD MODE 64 CHAR                10   19550  L %TO 15855 W
3621    IMP1    NCP                                                      1   19560  N
3622            BCL1   OIP1                                              7   19561  J 05067 1
                                                                                          G
3623            BA1    TYPE            IF FAILS REPEAT LINE              7   19568  R 19550 M
3624            B      OLTST                                             7   19575  J 05211
3625            WCP    TEST1           SPACE                            10   19582  M %TO 15920 W
3626            BCB1   *-16                                              7   19592  R 19582 2
                                                                                          G
3627            BA1    *&1                                               7   19599  R 19606 M
3628            WCP    TTYPE1          MCVE MODE 64 CHAR                10   19606  M %TO 15855 W
3629    IMP2    NCP                                                      1   19616  N
3630            BOL1   OIP1                                              7   19617  J 05067 1
                                                                                          G
3631            BA1    *-24            IF FAILS REPEAT LINE              7   19624  R 19606 M
3632            B      OLTST                                             7   19631  J 05211
3633            BNQ    ITR                                               7   19638  J 01007 Q
3634            BCE    TYPE,TAD1,1     REPEAT RCUTINE                   12   19645  B 19550 01001 1
3635    E2      B      0               CHECK FOR NEXT UNIT               7   19657  J 00000
3636            H                                                        1   19664  .
3637            END    2000                                                         J02000
                                   END OF ASSEMBLY
```