Program Number 06-208R0C

# COMMON 40 MB DISC FORMATTER

Consists of:

| | |
|---|---|
| Object Tape | 06-208M17 |
| Program Description | 06-208M95 |
| Program Listing | 06-208M96 |

PERKIN-ELMER

**Computer Systems Division**
2 Crescent Place
Oceanport, New Jersey 07757
(201) 229-6800


July 1977

# COMMON 40 MEGABYTE DISC FORMATTER

## 1. RELATED ITEMS

### 1.1 Related Documents

| | |
|---|---|
| Formatter Program Listing | 06-208M96R00A13 |
| Formatter Program Paper Tape | 06-208M17R00 |
| 40 Megabyte Disc System Programming Specification (Part of 40 Megabyte Disc System Instruction Manual 29-287) | 02-357A22 |

### 1.2 RELATED TEST PROGRAMS

The 06-208 Formatter Program requires a properly operating disc system.

For the 40 Megabyte Disc System, run the following test program:

| | |
|---|---|
| Common 40 Megabyte Test | 06-207 |

## 2. PURPOSE OF FORMATTER PROGRAM

The 06-208 Formatter Program formats the 40MB disc pack, and performs extensive error checking on each sector. A list of defective sectors (if any are detected) is produced as the sectors are flagged defective. This list identifies defective sectors by Logical Block Address (position within the linear array of sectors on the pack), and by Cylinder, Head, and Sector Address.

## 3. MINIMUM HARDWARE REQUIRED

The following is a list of the minimum hardware required to run this test:

1. Processor: Model 7/16, 7/32, or 8/32 (or equivalent).
2. Minimum Memory: 16K Bytes
3. Selector Channel (SELCH or ESELCH)
4. 40MB Disc Controller, Drive, and Pack
5. Console Input Device (refer to Appendix 1):

   Teletype, CRT, or Carousel 15/30/300

6. List Device (refer to Appendix 1):

   Teletype, CRT, Carousel 15/30/300, or Line Printer

## 4. SYSTEM REQUIREMENTS

This program assumes that the tests listed under RELATED TEST PROGRAMS have been run without the detection of an error.

### 4.1 Device Addresses

1. The Disc System Controller should be strapped for device address X'FB'. If the address is different, the DISCON option must be entered. Refer to Appendices 2 and 3.

2. Each Disc Drive is assumed to be strapped for a device address from X'FC' - X'FF', for drives 0-3 respectively. This address is trapped by the Controller, and is not specifically entered by any option. To select the desired Drive, the DRIVE option must be entered. Refer to Appendixes 2 and 3.

3. The Selector Channel (SELCH or ESELCH) is assumed to be strapped for device address X'F0'. If the address is different, the SELCH option must be entered. Refer to Appendixes 2 and 3.

### 4.2 Hardware Changes

The Format Switch on the Disc System Controller must be manually set to the FORMAT position before executing this program. When formatting is finished, the Format Switch should be placed in the NORMAL position to prevent accidental destruction of the data written to the sector headers.

## 5. LOADING PROCEDURES

### 5.1 Object Tape Format

The 06-208M17 Tape is an Absolute, Non-Zoned Memory Image Tape with Front End Boot Loader. The program occupies approximately 16KB of memory.

5.2 Normal Loading Procedure

1. Manually enter the X'50' Sequence shown below, into memory:

| LOCATION | CONTENTS | |
|---|---|---|
| X'30' | X'0000' | |
| X'32' | X'0000' | |
| X'34' | X'0000' | |
| X'36' | X'0050' | |
| X'50' | X'D500' | |
| X'52' | X'00CF' | |
| X'54' | X'4300' | |
| X'56' | X'0080' | |
| X'78' | X'0294' | For TTY or Carousel 35 |
| X'78' | X'0399' | For HSPTR |
| X'78' | X'1399' | For HSPTR/P |

2. Place Formatter Object Tape in the Paper Tape Reader.

3. Execute at address X'30'.

4. When the processor halts, observe the CHKSUM byte, displayed on Processor Display Panel Indicator D1. If it is ZERO, loading is complete; otherwise, repeat the loading procedure.

5.3 Multi-Media Diagnostic Loading Procedure.

To load this program from the INTERDATA Multi-Media Diagnostic System, refer to Publication Number 06-176A15.

5.4 Program Execution

1. Refer to Appendix 1 and set up the addresses for the Console Input Device and the List Device.

2. For a 32-bit Processor, address location X'A00'. For a 16-bit Processor address location X'A04'. Start program execution, and note that the following is output to the Console Device:

COMMON 40MB DISC FORMATTER 06-208R00

# 6. OPERATING PROCEDURES

Manually place the Format switch on the Disc System Controller in the FORMAT position, mount the disc pack(s), and put the required Drive(s) on-line.

To FORMAT a disc pack, refer to Section 6.1.

To FLAG sectors defective manually, refer to Section 6.2.

To CLEAR recorded information, refer to Section 6.3.

Table 1. Options to be Entered

| OPTION | APPLICATION | DEFAULT |
|---|---|---|
| SELCH | Selector Channel Address | X'F0' |
| DISCON | Disc Controller Address | X'FB' |
| DRIVE | Selects any Drives 0-3 | NONE |
| PACTYP | Identifies Pack Type and CE Packs | X'0040' |
| LOCYL | Low Cylinder Address | X'FFFF' |
| HICYL | High Cylinder Address | X'FFFF' |
| FMTWP | Format with Write Protect bit Set (1) | 0 |
| FMTSEC | Format by Sector (1) or by Track (0) | 1 |

## 6.1 Formatting the Disc Pack

From one to four disc packs, of the same type, may be formatted sequentially without user intervention.

### 6.1.1 Default Formatting Procedure

This section describes the procedure required to format a single disc pack, mounted on Drive 0.

Ensure that the SELCH and DISCON options are correct, then enter the following sequence of commands:

*LOCYL 0 (CR)

*HICYL 195 (CR)

*DRIVE 0 (CR)

*FORMAT (CR)

### 6.1.2 Optional Formatting Procedures

The DRIVE, LOCYL, HICYL, FMTWP, FMTSEC, and PACTYP options may be changed from the default values to provide the desired program function. Refer to Appendices 2 and 3.

### 6.1.3 Messages Output

1. After the FORMAT command is entered, the cylinders between LOCYL and HICYL (inclusively) are formatted, for each indicated Drive. Defective sectors are written with the DEF SEC bit set in the sector header, and the following message is output to the List Device for each sector flagged defective:

   DEF SEC FLAGGED mmmmmmmmm TTT HH KK

   where: mmmmmmmmm is the sector's Logical Block Address

   TTT is the Cylinder Address

   HH is the Head Address

   KK is the Sector Address on the track

   If the FMTSEC option is ZERO, the message appears in the following format:

   DEF TRK FLAGGED mmmmmmmmm TTT HH

   where: mmmmmmmmm is the Logical Block Address for sector

   zero of the flagged track

   and all other printout is as described above.

2. The program tests each sector after flagging, for Defective Sector status from the Disc System Controller. If the expected status is not returned, the following message is output to the List Device:

   FLAG REJECTED mmmmmmmmm TTT HH KK <---X

   where: mmmmmmmmm is the Logical Block Address for the sector

   which cannot be flagged

   and all other printout is as described above.

3. If a single, recoverable error is detected for any sector, the following message is output to the List Device:

   SOFT ERROR mmmmmmmm TTT HH KK

   where: mmmmmmmm TTT HH and KK identify the sector producing the soft error. For critical applications, any sector identified in the SOFT ERROR message may later be manually flagged as defective (see Section 6.2).

4. When formatting is complete for the packs on all specified Drives, the sequence terminates, an asterisk is output to the Console Device, and the program waits for user input.

NOTES

1. Special care should be taken not to use any sector identified in the FLAG REJECTED message. In some Operating System environments, the disc pack must be considered unusable if FLAGGED REJECTED is printed.

2. Invalid Cylinder Addresses are bypassed for a CE pack.

3. If an unrecoverable error status is returned from the currently selected disc Drive while formatting, the Drive is released, and the next Drive specified by the DRIVE option (if any) is selected. When all specified Drives have been selected and released, the sequence terminates. No attempt is made to re-select a Drive, once released.

4. If it is desired to halt the formatting process, depress and hold the BREAK (BRK) key on the console I/O device. Formatting stops when the current cylinder is complete.

## 6.2 Manual Sector Flagging

This program allows the user to set the Defective Sector bit in the header of any specified sector, by entry of the commands detailed below. The user may wish to flag those sectors (if any) identified in the SOFT ERROR message during the formatting process.

If the FMTSEC option is ONE, a sector may be flagged defective by entering one of the following commands:

FLAG mmmmmmmmm (CR) ; or

FLAG TTT HH KK (CR)

where: mmmmmmmmm is the Sector's Logical Block Address

TTT is the Cylinder Address

HH is the Head Address

KK is the Sector Address

If the FMTSEC option is ZERO, all sectors on the indicated track may be flagged by entering one of the following commands:

FLAG mmmmmmmmm (CR) ; or

FLAG TTT HH (CR)

where: the operands are explained above.

The indicated sector is written with the DEF SEC bit set in the the sector header, and the appropriate message is output to the List Device.

DEF SEC FLAGGED mmmmmmmmm TTT HH KK ; or

DEF TRK FLAGGED mmmmmmmmm TTT HH

where: in the DEF TRK FLAGGED message, mmmmmmmmm is the Logical Block Address for sector zero on the indicated track.

The program tests each sector after flagging, for Defective Sector status from the Disc System Controller. If the expected status is not returned, the following message is output to the List Device:

FLAG REJECTED mmmmmmmmm TTT HH KK <---X

where: mmmmmmmmm is the Logical Block Address of the sector which could not be flagged.

NOTES

1. Special care should be taken not to use any sector indentified in the FLAG REJECTED message. In some Operating System environments, the disc pack must be considered unusable if FLAG REJECTED is printed.

2. An invalid cylinder address causes an error message to be printed for a CE pack; no operation is performed.

3. After flagging a sector on a disc to be used with OS/16 MT or OS/32 MT, the disc pack must be re-initialized, using the appropriate Disc Initialization utility, before attempting normal use of the disc pack.

## 6.3 Clearing the Disc Pack

The CLEAR command allows the Customer Engineer to remove all recorded information from the sectors on a specified area of the disc pack.

To write binary zeros to the Header, Gap2, Sync2, Data, and Normal and Format Mode LRCC field for each sector on the cylinders from LOCYL to HICYL, inclusively, enter the following command:

CLEAR (CR)

CAUTION

THE CLEAR COMMAND DESTROYS THE FORMAT FOR ALL SECTORS ON THE DESIGNATED AREA OF THE PACK. THIS OCCURS VERY QUICKLY. THE CLEAR COMMAND SHOULD NOT NORMALLY BE USED, EXCEPT BY THE CUSTOMER ENGINEER.

NOTES

1. Invalid cylinder addresses are bypassed for a CE pack.

2. If it is desired to halt the CLEAR process, depress and hold the BREAK (BRK) key on the console I/O device. The process stops when the current cylinder is complete.

# 7. ERROR PROCEDURES

## 7.1 Recoverable Errors

If the SELCH, Disc Controller, or Disc Drive does not respond to the device address sent, the following message is output to the Console Device:

DEV DDD FALSE SYNC **

where: DDD is the device address. If this message is returned, check that the SELCH and DISCON options are correct; also check that all interfaces are fully seated.

## 7.2 Irrecoverable Errors

If a Machine Malfunction Interrupt is taken, the Processor is halted. When the RUN (EXECUTE) switch is depressed, the following message is output to the Console Device:

ERROR 00F3

PSW PPPP LOC LLLL

where: F3 is the code for Machine Malfunction

PPPP is the least significant 16 bits of the PSW status when error was detected.

LLLL is the least significant 16 bits of the PSW location counter when the error was detected.

In the case of irrecoverable errors other than Machine Malfunction Interrupt, the following message is immediately printed, and control is then returned to the Console Device:

ERROR 00FN

PSW PPPP LOC LLLL

where: FN is the code for the Irrecoverable Error detected, and other printout is as described above (see Appendix 5).

# 8. PROGRAMMING NOTES

## 8.1 Formatting Times

This program requires approximately four (4) hours to format an entire, single 40MB Disc Pack. When multi-disc formatting is specified, an additional four (4) hours is required to format each additional pack.

## 8.2 Formatting Algorithm

A worst-case data halfword is copied into the entire sector, including Header, GAP2, SYNC2, Data, and Normal Mode LRCC fields. The sector is then "Read-Checked" by doing a format-mode Read without the SELCH; no LRC error should result. The pattern is read five times. On the fifth read, the SELCH is used, and the data read is tested for correctness. This operation is performed for the hexadecimal halfword patterns FFFF, DB6D, 6DB6 and B6DB. For each read, a single detected error may be tallied as a "soft" error.

The sector is then written with proper format (correct Header, GAP2, SYNC2, and Normal Mode LRCC fields); the Data field is zero-filled. A Read-Check is then performed on the sector. Any detected error is tallied as a "hard" error.

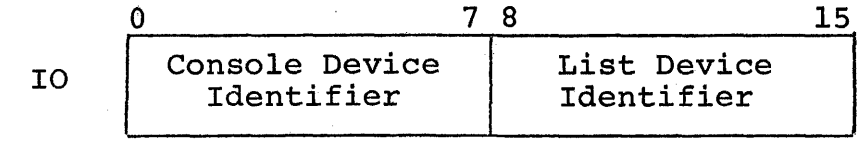
When all sectors in the cylinder have been tested, the individual tallies are checked. A sector with one "soft" error and no "hard" error results in a commentary message. The user may later flag the sector manually, at his option. A sector with two or more "soft" errors, and any "hard" error, is flagged defective, and a message is output. After a sector is flagged, the flag is tested. If the sector could not be flagged, a conspicious message is output.

When this sequence is complete for all sectors in the cylinder, the next cylinder is selected, if so specified.

# APPENDIX 1

## USER DEVICE DEFINITION

The halfword labeled 'IO' (see the Program Listing) has the default value for teletype, CRT, or Carousel 15/30 (all on Current Loop Interface) as the input/output console device. If the setup is different, 'IO' must be changed as follows:




| CONSOLE DEVICE IDENTIFIER | MEANING |
|---|---|
| X'01' | GDT/CRT on PASLA/PALM interface, strapped for FDX operation and highest baud rate. |
| X'02' | TTY/GDT/CRT/Carousel 15/30/35 on TTY/Current Loop Interface |
| X'03' | Reserved. Interpreted as X'02'. |
| X'04' | Carousel 300 on PASLA/PALM interface, strapped for FDX operation and highest baud rate. |
| X'00', X'05' - X'FF' | Reserved. Interpreted as X'02'. |

| LIST DEVICE IDENTIFIER | MEANING |
|---|---|
| X'01' | As above |
| X'02' | As above |
| X'03' | Line Printer (Data Printer or Centronics) On Line Printer Interface |
| X'04' | As above |
| X'00', X'05' - X'FF' | As above |

1. The GDT (Graphic Display Terminal), or CRT, if used on PASLA/PALM interface, should be strapped for device addresses X'10' and X'11', for Receive and Transmit sides, respectively. If the addresses are different, the halfword labeled 'PASLADR' (see the Program Listing) must be changed accordingly.

2. The Teletype or Current Loop Interface, if used, should be strapped for device address X'02'. If the address is different, the halfword labeled 'CLIFADR' (see the Program Listing) must be changed accordingly.

3. The Carousel 300 on PASLA/PALM interface, if used, should be strapped for device addresses X'10' and X'11' for Receive and Transmit sides, respectively. If the addresses are different, the halfword labeled 'C300ADR' (see the Program Listing) must be changed accordingly.

4. The Line Printer, if used, should be strapped for device address X'62'. If the address is different, the halfword labeled 'LPADR' (see the Program Listing) must be changed accordingly.

# APPENDIX 2

## OPTION/COMMAND INPUT STRUCTURE

An asterisk (*) is output to the Console device to indicate that the program is awaiting option input. Any option may be typed in from the Console Input Device, followed by a space and the desired hexadecimal value; an exception is the DRIVE option, which accepts arguments separated by commas. A carriage return (CR) is issued to terminate every option/command input. An invalid option/command or value causes a (?) followed by a carriage return (CR), line feed (LF) and an asterisk (*) to occur.

# APPENDIX 3

Examine each option in the following list, and read each description. If a default value is specified, and is the value desired, no action is necessary. If a default value is not specified, or is not the desired value, then the option must be entered. See Appendix 2 for Command Input Structure.

NOTE

All numeric input and printout is hexadecimal (base 16).

| OPTION | MANDATORY | DEFAULT VALUE | DESCRIPTION |
|---|---|---|---|
| OPTION | | N/A | Causes all options, with their current values, to be displayed on the console device. |
| SELCH | | X'00F0' | Defines Selector Channel Address |
| DISCON | | X'00FB' | Defines Disc Controller Address |
| DRIVE | x | NONE | Defines which Drives attached to the Controller are to be used. Any combination of 0, 1, 2, or 3 may be selected. For example, to select drives 0 and 1, enter the following command:<br><br>*DRIVE 0,1 (CR) |
| PACTYP | | 0040 | Identifies the type of pack being formatted. Type CE40 designates a Customer Engineer pack. The suffix digits (40) are defined as follows:<br><br>SUFFIX — MEANING<br>40 — 40MB Pack (max. Cyl. Address = X'195') |
| LOCYL | x | X'FFFF' | Establishes the low cylinder address for the formatting process. LOCYL must not be greater than the HICYL option, nor greater than the number of cylinders referenced by the PACTYP option. |

| OPTION | MANDATORY | DEFAULT VALUE | DESCRIPTION |
|---|---|---|---|
| HICYL | x | X'FFFF' | Establishes the high cylinder address for the formatting process. HICYL must not be less than the LOCYL option, and must not be greater than the number of cylinders referenced by the PACTYP option. (X'195') |
| FMTWP | | 0 | Specifies whether the WRITE PROTECT bit is to be set in the sector headers during the formatting process.<br><br>0 = RESET WRITE PROTECT BIT<br><br>1 = SET WRITE PROTECT BIT |
| FMTSEC | | 1 | Specifies whether defective areas of the pack are to be flagged by sector, or whether all sectors in the track are to be flagged.<br><br>0 = FLAG ALL SECTORS IN THE TRACK<br><br>1 = FLAG DEFECTIVE SECTORS ONLY |
| FORMAT | | N/A | Causes the Disc Pack to be formatted according to the options selected. |
| CLEAR | | N/A | Causes all sectors from LOCYL to HICYL inclusively to be filled with binary ZEROS, including Header, Data, and LRC fields. |
| FLAG | | N/A | 1. Causes the specified sector, only, to be flagged defective, if FMTSEC=1. Valid commands in this case are:<br><br>FLAG mmmmmmmmm<br><br>FLAG TTT HH KK<br><br>2. Causes the track in which the specified sector lies to be flagged defective, if FMTSEC=0. Valid commands in this case are:<br><br>FLAG mmmmmmmmm<br><br>FLAG TTT HH |

# APPENDIX 4
# EXPECTED PRINTOUT

```
COMMON 40MB DISC FORMATTER 06-208R00
*OPTION
DRIVE
DISCON 00FB
SELCH  00F0
PACTYP 0040
FMTSEC 0001
LOCYL  FFFF
HICYL  FFFF
FMTWP  0000

*LOCYL 0                    (Default Formatting Procedure)
*HICYL 195
*DRIVE 0
*FORMAT
DRIVE 0 SELECTED
*                           (Formatting Complete)
```

The sequence above causes the Disc Pack mounted on Drive 0 to be formatted. More than one Drive may be specified. For example, to format the packs on Drives 0, 1, 2 and 3:

```
*LOCYL 0
*HICYL 195
*DRIVE 0,1,2,3
*FORMAT
DRIVE 0 SELECTED
DRIVE 1 SELECTED
DRIVE 2 SELECTED
DRIVE 3 SELECTED
*                           (Formatting complete)
```

With the Option Table values shown, if a "hard" sector error is detected for the pack mounted on Drive 1, a message is printed in the format shown below. (For this example, the error is shown to have occurred on Cylinder 147, Head OD, Sector OC, of the pack mounted on Drive 1).

```
*FORMAT
DRIVE 0 SELECTED
DRIVE 1 SELECTED
DEF SEC FLAGGED  00020000 147 OD OC
     .
     .
     .
```

If a "soft" (recoverable) error is detected for the same sector, printout is as follows:

```
*FORMAT
DRIVE 0 SELECTED
DRIVE 1 SELECTED
SOFT ERROR  00020000 147 OD OC
     .
     .
     .
```

In this case, the user may manually flag the sector as defective, when formatting is complete. Note that if more than one Drive was used for formatting, the correct Drive must be specified:

```
*FLAG 00020000
WHICH DRIVE?
*DRIVE 1
*FLAG 00020000
DRIVE 1 SELECTED
DEF SEC FLAGGED 00020000 147 OD OC
```

A range of contiguous cylinders may have the sector headers and sync, data, and LRCC fields written as zeros by the Customer Engineer, using the following sequence of commands:

```
*DRIVE 0
*LOCYL 0
*HICYL 10
*CLEAR
DRIVE 0 SELECTED
*
```

# APPENDIX 5

## ERROR TABLE

Irrecoverable errors result in the printing of the messages described below:

```
ERROR OOFN
DEV DDD STA SS
PSW PPPP LOC LLLL
      or
ERROR OOFN
PSW PPPP LOC LLLL
```

where: OOF1 = Arithmetic Fault Interrupt

OOF2 = Illegal Instruction Interrupt

OOF3 - Machine Malfunction Interrupt (see Note)

OOF4 = Spurious Device Interrupt

OOF5 = 32-Bit Relocation/Protection Interrupt, or 16-Bit Floating Point Divide Interrupt

DDD = Device address returned when the interrupt occurred

SS = Status of the interrupting device

PPPP = Least significant 16 bits of PSW status when the interrupt occurred

LLLL = Least significant 16 bits of PSW Location Counter when the interrupt occurred.

NOTE

For the Machine Malfunction Interrupt, the last 4 bits of the PSW status define the type of failure, as described below:

X100 Parity Error on Data Fetch

0010 Parity Error on Instruction Fetch

X001 Power Fail

0000 Power Restore

1X0X Parity Error or Power Fail during an Auto Driver Channel Operation (32-bit Processors only).

Messages which may be output during execution of this program are summarized below. For additional information, refer to Operating Procedures (Section 6).

1. INVALID XXXXXX OPTION

This message is printed after the FORMAT, FLAG or CLEAR command is entered, if the indicated option has not been entered, or is incorrect.

2. WHICH DRIVE?

This message is printed after the FLAG or CLEAR command is entered, if more than one Drive is currently available for the operation. The user must enter the DRIVE option, specifying the desired Drive only, then re-enter the previous command (FLAG or CLEAR).

3. ILLEGAL CYLINDER ADDRESS XXX - CE PACK

This message is printed after the FLAG command is entered, if the user attempts to flag a sector or track within an "invalid" area on a Customer Engineer pack. The message is also printed if the FORMAT or CLEAR command is entered, and the LOCYL or HICYL option lies within such an area.

4. DEV DDD FALSE SYNC **

This message is printed after the FORMAT, FLAG or CLEAR command is entered, if the SELCH, Controller, or Disc Drive does not respond to address DDD. The user should verify that the SELCH and DISCON options are correct.

NOTE

If the SELCH and DISCON options are correct, Hardware Maintenance personnel should be requested to check that the interfaces and cable connectors are firmly seated, and that the system RACK0/TACK0 chain is not broken.

5. CONTROLLER FORMAT SWITCH OFF

This message is printed when it is determined that the Format Switch on the Disc Controller is not in the FORMAT position.

NOTE

If the correct DISCON option has been entered, Hardware Maintenance personnel should be requested to aid in the proper positioning of the Format Switch for the indicated controller.

6. DRIVE X: WRITE PROTECTED

This message is printed when the indicated Drive returns Write Protect status. The user should depress the WRITE ONLY button on the Drive's operator panel to turn the indicator OFF. The previous command should then be re-entered.

7. DRIVE X: OFF LINE

This message is printed when the indicated Drive returns status X'09'. The user should check that the correct DRIVE option has been entered. If the DRIVE option is correct, verify that a disc pack has been properly mounted, that the pack access door is latched, and that the spindle motor has been started.

8. DRIVE X: UNRECOVERABLE ERROR - STATUS YY

This message is printed when the indicated Drive returns Unsafe, Write Check, Illegal Address or Seek Incomplete status which cannot be cleared by normal techniques. Power should be removed from the Drive for several seconds, then restored.

9. SOFT ERROR mmmmmmmmm TTT HH KK

This message is printed if a single, recoverable sector error is detected while formatting. The sector in error is identified by Logical Block Address, and by Cylinder, Head, and Sector Address.

10. DEF SEC FLAGGED mmmmmmmmm TTT HH KK

This message is printed when a defective sector is flagged, if the FMTSEC option is ONE. The Sector is identified by Logical Block Address, and by Cylinder, Head, and Sector Address.

11. DEF TRK FLAGGED mmmmmmmmm TTT HH

This message is printed when a defective sector is flagged, if the FMTSEC option is ZERO. All Sectors on the indicated track are flagged; the message identifies the Logical Block Address of Sector 0 of the indicated head and cylinder.

12. FLAG REJECTED mmmmmmmmm TTT HH KK <— — — X

This message is printed when an attempt is made to flag a sector as defective, and the attempt fails. The Logical Block Address and the Cylinder, Head, and Sector Address of the sector rejecting the flag, are displayed.

NOTE

Special care should be taken not to use any sector identified in the FLAG REJECTED message. In some Operating System environments, the disc pack must be considered unusable if FLAG REJECTED is printed.

13. DRIVE X SELECTED

This message is printed following the FORMAT, FLAG, or CLEAR command, and identifies the Drive in use. The message is also printed whenever a new Drive is selected, if multiple-Drive formatting is specified.

14. REDUNDANT SEEK ERROR

This message is printed after the disc pack on the current selected disc drive has been formatted, if the final Read-Check for Head 0, Sector 0 of all cylinders in the range LOCYL:HICYL produces any Header Error status not accompanied by Defective Sector status. This indicates a hardware problem; proper format of the disc pack is not guaranteed.

PROG= FMT40  ASSEMBLED BY CAL 03-066R04-01 (32-BIT)

```
                          2          CROSS                                                  MBF00030
    0000R                 3          SQCMK                                                  MBF00040
                          4          NORX3                                                  MBF00050
                          5          TARGT  16                                              MBF00060
                          6          WIDTH  120                                             MBF00070
                          7  **                                                             MBF00080
                          8  * COMMON 40MB DISC FORMATTER 06-208R00                         MBF00090
                          9  * COPYRIGHT INTERDATA, INC. SEPTEMBER, 1976                    MBF00100
                         10  *                                                              MBF00110
                         11  * PROGRAM USES THE COMMON INSTRUCTION SET                      MBF00120
                         12  *                                                              MBF00130
                         13  * THIS PROGRAM FORMATS DISC PACKS FOR THE INTERDATA 40MB FAMILY OF  MBF00140
                         14  * DISC DRIVES. FIXED-LENGTH, SEQUENTIAL SECTORING IS PERFORMED  MBF00150
                         15  * USING AN INTERLEAVED-SECTOR ACCESS TECHNIQUE FOR FASTER THROUGHPUT.  MBF00160
                         16  * A SURFACE EVALUATION IS PERFORMED FOR UP TO FOUR DISC PACKS,  MBF00170
                         17  * MOUNTED ON AS MANY DRIVES OF THE SAME TYPE. FAULTY SECTORS ARE  MBF00180
                         18  * FLAGGED AS DEFECTIVE; THE FLAG IS TESTED FOR EACH FAULTY SECTOR.  MBF00190
                         19  * THE DISC PACK(S) MAY BE FORMATTED ON A DEFECTIVE SECTOR BASIS  MBF00200
                         20  * FOR ANY DETECTED SECTOR ERRORS, OR MAY BE FORMATTED ON A DEFECTIVE  MBF00210
                         21  * TRACK BASIS, WHERE EACH SECTOR IN ANY TRACK WITH A DEFECTIVE  MBF00220
                         22  * SECTOR HAS ALL SECTORS IN THAT TRACK FLAGGED AS DEFECTIVE.  MBF00230
                         23  * IN ADDITION, THE WRITE PROTECT BIT IN THE SECTOR HEADERS MAY BE  MBF00240
                         24  * SET, IF DESIRED.                                             MBF00250
                         25  *                                                              MBF00260
                         26  * THIS PROGRAM PERMITS MANUAL FLAGGING OF DEFECTIVE SECTORS, BY  MBF00270
                         27  * ENTRY OF THE SECTOR'S LOGICAL BLOCK ADDRESS, OR BY ENTRY OF THE  MBF00280
                         28  * CYLINDER, HEAD, AND SECTOR ADDRESSES. IN ADDITION, THE PROGRAM  MBF00290
                         29  * ALLOWS THE CUSTOMER ENGINEER TO ERASE ALL ACCESSIBLE AREAS    MBF00300
                         30  * WITHIN A RANGE OF CONTIGUOUS CYLINDERS. CE PACK CYLINDER ADDRESS  MBF00310
                         31  * CONVENTIONS ARE OBSERVED.                                    MBF00320
                         32  *                                                              MBF00330
                         33  * THE PROGRAM REQUIRES A 7/16 BASIC, 7/32, 8/32, OR EQUIVALENT  MBF00340
                         34  * PROCESSOR, WITH MINIMUM 16K BYTES OF MEMORY. OPTIONS AND COMMANDS  MBF00350
                         35  * ARE TO BE ENTERED VIA A CONSOLE I/O DEVICE.                   MBF00360
                         36  *                                                              MBF00370
                         37  *--------------                                               MBF00380
                         38  *                                                              MBF00390
                         39  * THE 06-208M17R00 TAPE IS AN ABSOLUTE TAPE WITH FRONT-END BOOT LOADER.  MBF00400
                         40  *                                                              MBF00410
```

```
                                  **ETPE                                                                                MBF00430
                                  *                                                                                     MBF00440
                                  *                                                                                     MBF00450
0000 0000                         R0        EQU     0                                                                   MBF00460
0000 0001                         R1        EQU     1                                                                   MBF00470
0000 0002                         R2        EQU     2                                                                   MBF00480
0000 0003                         R3        EQU     3                                                                   MBF00490
0000 0004                         R4        EQU     4                                                                   MBF00500
0000 0005                         R5        EQU     5                                                                   MBF00510
0000 0006                         R6        EQU     6                                                                   MBF00520
0000 0007                         R7        EQU     7                                                                   MBF00530
0000 0008                         R8        EQU     8                                                                   MBF00540
0000 0009                         R9        EQU     9                                                                   MBF00550
0000 000A                         R10       EQU     10                                                                  MBF00560
0000 000B                         R11       EQU     11                                                                  MBF00570
0000 000C                         R12       EQU     12                                                                  MBF00580
0000 000D                         R13       EQU     13                                                                  MBF00590
0000 000E                         R14       EQU     14                                                                  MBF00600
0000 000E                         RET       EQU     14                                                                  MBF00610
0000 000F                         R15       EQU     15                                                                  MBF00620
0000 000F                         LINK      EQU     15                                                                  MBF00630
                                  *                                                                                     MBF00640
                                  *  BOOTLOADER WITH CHKSUM                                                             MBF00650
                                  *                                                                                     MBF00660
0000R                             ORG       X'80'                                                                       MBF00670
0080 2421                         LIS       R2,1                                                                        MBF00680
0082 2303                         BS        BOOT                                                                        MBF00690
0084 2340                         DC        Z(PSWSAVE)      CURRENT PSW SAVE POINTER(32-BIT M/C)                        MBF00700
0086 2348                         DC        Z(RSAVE)        REGISTER SAVE POINTER(32-BIT M/C)                           MBF00710
0088 4020 0022                    STH       R2,X'22'        REGISTER SAVE POINTER(16-BIT M/C)                           MBF00720
008C C810 0A00                    LHI       R1,X'A00'       R1 = ADR( FIRST BYTE OF TEST PROG )                         MBF00730
0090 C830 22E9                    LHI       R3,LNZB         R3 = ADR( LAST NON-ZERO BYTE )                              MBF00740
0094 C860 0000                    LHI       R6,0            R6 = CHKSUM BYTE = X'MN'                                    MBF00750
0098 D340 0078                    LB        R4,X'78'        INPUT DEV ADR                                               MBF00760
009C DE40 0079                    OC        R4,X'79'                                                                    MBF00770
00A0 9D45                 LEADER  SSR       R4,R5                                                                       MBF00780
00A2 2091                         BTBS      9,1             DU,BSY                                                      MBF00790
00A4 9B45                         RDR       R4,R5                                                                       MBF00800
00A6 0855                         LDAR      R5,R5                                                                       MBF00810
00A8 2234                         BZS       LEADER          IGNORE LEADER                                               MBF00820
00AA D251 0000            LOAD    STB       R5,0(R1)        STORE 1ST NON-ZERO & SUBSEQUENT BYTE                        MBF00830
00AE D351 0000                    LB        R5,0(R1)        RELOAD DATA BYTE TO                                         MBF00840
00B2 0765                         XAR       R6,R5           GENERATE CHKSUM                                             MBF00850
00B4 9481                         EXBR      R8,R1                                                                       MBF00860
00B6 9828                         WHR       R2,R8           DISPLAY CORE ADRESS                                         MBF00870
00B8 9D45                         SSR       R4,R5                                                                       MBF00880
00BA 2091                         BTBS      9,1             DU,BSY                                                      MBF00890
00BC 9B45                         RDR       R4,R5                                                                       MBF00900
00BE C110 00AA                    BXLE      R1,LOAD         LOAD TILL LAST BYTE                                         MBF00910
00C2 9486                         EXBR      R8,R6                                                                       MBF00920
00C4 9828                         WHR       R2,R8           FINAL CHKSUM                                                MBF00930
00C6 2478                 LDWT    LIS       R7,8                                                                        MBF00940
00C8 917C                         SLLS      R7,12           R7 = X'8000'                                                MBF00950
00CA 9557                         EPSR      R5,R7           HALT PROCESSOR.                                             MBF00960
00CC 2203                         BS        LDWT                                                                        MBF00970
```

EXEC - ETPE R03P0 (DEPOPULATED)

```
00CE                          98          ORG     X'A00'                                                  MBF00990
0A00  4300 0A30               99  ORIGIN1 B       START1          START HERE FOR 32-BIT PROCESSOR         MBF01000
0A04  4300 0A46              100  ORIGIN2 B       START2          START HERE FOR 16-BIT PROCESSOR         MBF01010
0A08  4300 0A5E              101  ORIGIN3 B       START3          SPECIAL 32-BIT PROCESSOR START          MBF01020
0A0C  4300 0A62              102  ORIGIN4 B       START4          SPECIAL 16-BIT PROCESSOR START          MBF01030
                             103  *                                                                       MBF01040
                             104  *-----------------------------                                          MBF01050
                             105  *   TEST CONSTANTS                          *                           MBF01060
                             106  *                                                                       MBF01070
0A10  0202                   107  IO      DC      X'0202'         I/O DEVICE(S) IDENTIFIER                MBF01080
0A12  1011                   108  PASLADR DC      X'1011'         PASLA/PALM READ/WRITE ADDRESSES         MBF01090
0A14  0202                   109  CLIFADR DC      X'0202'         CURRENT LOOP INTERFACE R/W ADDRESSES    MBF01100
0A16  6262                   110  LPADR   DC      X'6262'         LINE PRINTER ADDRESS                    MBF01110
0A18  1011                   111  C300ADR DC      X'1011'         CAROUSEL 300/PASLA ADDRESSES            MBF01120
0A1A  0000                   112          DCX     0               PROVISION FOR SPECIAL DEVICE            MBF01130
0A1C  0140                   113  TIME    DC      X'140'          CONSTANT FOR 1 MS DELAY(X'C8'-MOD70)    MBF01140
0A1E  0000                   114          DCX     0               RESERVED                                MBF01150
0A20  30F0                   115  PSW     DCX     30F0            PSW USED IN PROGRAM                     MBF01160
0A22  30F0                   116  PSW2    DCX     30F0            PSW USED IN EXEC                        MBF01170
0A24  0000                   117          DCX     0               RESERVED                                MBF01180
0A26  0000                   118          DCX     0               RESERVED                                MBF01190
0A28  0000                   119          DCX     0               RESERVED                                MBF01200
0A2A  0000                   120          DCX     0               RESERVED                                MBF01210
0A2C  0000                   121          DCX     0               RESERVED                                MBF01220
0A2E  0000                   122          DCX     0               RESERVED                                MBF01230
                             123  *-----------------------------                                          MBF01240
                             124  *                                                                       MBF01250
0A30  0711                   125  START1  XAR     R1,R1                                                   MBF01260
0A32  4010 0030              126          STH     R1,X'30'        DISABLE INT AT PROCESSOR LEVEL          MBF01270
0A36  4820 0A22              127          LH      R2,PSW2                                                 MBF01280
0A3A  4020 0032              128          STH     R2,X'32'        SELECT REG SET 15                       MBF01290
0A3E  2521                   129          LCS     R2,1                                                    MBF01300
0A40  4020 14A0              130          STH     R2,MOD32        SET MODEL 32 PROCESSOR FLAG             MBF01310
0A44  2306                   131          BS      ST                                                      MBF01320
0A46  0711                   132  START2  XAR     R1,R1                                                   MBF01330
0A48  4010 14A0              133          STH     R1,MOD32        RESET MOD 32 PROCESSOR FLAG             MBF01340
0A4C  4810 0A22              134          LH      R1,PSW2                                                 MBF01350
0A50  C820 0A66              135  ST      LHI     R2,START                                                MBF01360
0A54  4010 0034              136          STH     R1,X'34'                                                MBF01370
0A58  4020 0036              137          STH     R2,X'36'        II INT NEW PSW LOC                      MBF01380
0A5C  0000                   138          DCX     0               TAKE AN ILLEGAL INSTRUCTION INT         MBF01390
                             139  *                                                                       MBF01400
0A5E  4300 0A30              140  START3  B       START1          INSERT SPECIAL ROUTINE HERE             MBF01410
0A62  4300 0A46              141  START4  B       START2          INSERT SPECIAL ROUTINE HERE             MBF01420
                             142  *                                                                       MBF01430
                             143  *                                                                       MBF01440
0A66  41F0 11F4              144  START   BAL     LINK,SETKB      ESTABLISH KEYBOARD DEVICE               MBF01450
0A6A  9300                   145          LBR     R0,R0                                                   MBF01460
0A6C  2701                   146          SIS     R0,1            CRT ON PASLA ?                          MBF01470
0A6E  4330 0A92              147          BZ      CRT             BRANCH IF YES.                          MBF01480
0A72  2703                   148          SIS     R0,3            CAROUSEL ON PASLA ?                     MBF01490
0A74  4200 0A74              149          NOP     *               PROVISION FOR SPECIAL KBD DEVICE        MBF01500
0A78  4230 0AB0              150          BNZ     TTY             BRANCH IF NO.                           MBF01510
0A7C  4000 112E              151  C300    STH     R0,PAUSE        RESET TRANS PAUSE FLAG                  MBF01520
```

```
0A80 4800 0A18  152          LH    R0,C300ADR      LOAD CAROUSEL ADDRESSES          MBF01530
0A84 4810 14C0  153          LH    R1,CARRD        CAROUSEL COMMANDS                MBF01540
0A88 D320 14C8  154          LB    R2,CAR2ND       PASLA/PALM FORMAT COMMAND        MBF01550
0A8C D340 14C5  155          LB    R4,CARRQ2S                                       MBF01560
0A90 2309       156          BS    CRT2                                             MBF01570
0A92 4810 14BE  157  CRT     LH    R1,CRTRD        CRT/PASLA COMMANDS               MBF01580
0A96 4800 0A12  158          LH    R0,PASLADR                                       MBF01590
0A9A D320 14C7  159          LB    R2,CRT2ND       AND FORMAT COMMAND               MBF01600
0A9E D340 14C4  160          LB    R4,CRTRQ2S                                       MBF01610
0AA2 4000 14B6  161  CRT2    STH   R0,PASFLG                                        MBF01620
0AA6 9330       162          LBR   R3,R0                                            MBF01630
0AA8 9E32       163          OCR   R3,R2           SET PASLA/PALM FORMAT            MBF01640
0AAA D240 14C6  164          STB   R4,CONRQ2S                                       MBF01650
0AAE 2309       165          BS    GOTIT                                            MBF01660
0AB0 2400       166  TTY     LIS   R0,0                                             MBF01670
0AB2 4000 14B6  167          STH   R0,PASFLG       RESET THIS FLAG                  MBF01680
0AB6 4800 0A14  168          LH    R0,CLIFADR                                       MBF01690
0ABA 4810 14CA  169          LH    R1,CLIFRD                                        MBF01700
0ABE 9421       170          EXBR  R2,R1                                            MBF01710
                171  *                                                             MBF01720
0AC0 4000 14B8  172  GOTIT   STH   R0,CONADR       CONSOLE DEVICE ADDRESSES         MBF01730
0AC4 4010 14BA  173          STH   R1,CONRD        CONSOLE READ/WRITE COMMANDS      MBF01740
0AC8 D220 14BC  174          STB   R2,CON2ND       AND FORMAT COMMAND (PASLA/PALM)  MBF01750
0ACC 41F0 1280  175          BAL   LINK,LCORE      SET UP LOW CORE                  MBF01760
0AD0 2400       176          LIS   R0,0                                             MBF01770
0AD2 4000 14D8  177          STH   R0,WASDU                                         MBF01780
0AD6 41F0 10AE  178          BAL   LINK,CRLF                                        MBF01790
0ADA C850 169E  179          LDAI  R5,TITLE                                         MBF01800
0ADE 41F0 101E  180          BAL   R15,PRINT       PRINT TEST PROGRAM TITLE         MBF01810
                181  *-----------------------------                                MBF01820
                182  *  KEYBOARD INPUT ROUTINE                                     MBF01830
                183  *                                                             MBF01840
0000 0AE2  184  OPTIN   EQU   *                                                     MBF01850
0AE2 41F0 10AE  185          BAL   LINK,CRLF       CR,LF TO LIST DEVICE             MBF01860
0000 0AE6  186  OPTIN1  EQU   *                                                     MBF01870
0AE6 4820 0A22  187          LH    R2,PSW2                                          MBF01880
0AEA 9512       188          EPSR  R1,R2           NO INT, REG SET 15               MBF01890
0AEC 41F0 11F4  189          BAL   LINK,SETKB      ESTABLISH CONSOLE                MBF01900
0AF0 D340 154E  190          LB    R4,AMSG         OUTPUT AN * TO INDICATE          MBF01910
0AF4 41F0 10BC  191          BAL   LINK,OUTCHR     COMMAND MODE ESTABLISHED         MBF01920
0AF8 2541       192          LCS   R4,1            X'FF'                            MBF01930
0AFA 41F0 10BC  193          BAL   LINK,OUTCHR                                      MBF01940
0AFE C8C0 1158  194          LDAI  R12,QUESTN      SET ERROR RETURN                 MBF01950
0B02 0711       195          XAR   R1,R1           CLEAR OPTBUF INDEX               MBF01960
0B04 41F0 1130  196  RDCHR   BAL   R15,GETCHR      GET A CHAR IN R4                 MBF01970
0B08 C540 0060  197          CLHI  R4,X'60'        UPPER CASE ALPHA ?               MBF01980
0B0C 2183       198          BLS   RDCHAR0         BRANCH IF NO.                    MBF01990
0B0E CB40 0020  199          SHI   R4,X'20'        CONVERT TO LOWER CASE            MBF02000
0B12 C540 0023  200  RDCHAR0 CLHI  R4,X'23'        IS IT # ?                        MBF02010
0B16 4330 0AE2  201          BE    OPTIN                                            MBF02020
0B1A C540 005F  202          CLHI  R4,X'5F'        LEFT ARROW, UNDERLINE OR DELETE ? MBF02030
0B1E 2135       203          BNES  RDCHR1                                           MBF02040
0B20 2711       204          SIS   R1,1            YES, DECREMENT INDEX             MBF02050
0B22 021C       205          BMR   R12             BUFFER UNDERFLOW: PRINT '?'      MBF02060
```

EXEC - ETPE R03P0 (DEPOPULATED)

```
0B24  4300 0B04          206          B       RDCHR                                                  MBF02070
0B28  D241 22EA          207  RDCHR1  STB     R4,OPTBUF(R1)      STORE CURRENT BYTE                  MBF02080
0B2C  C540 000D          208          CLHI    R4,X'0D'           CARRIAGE RETURN ?                   MBF02090
0B30  2337               209          BES     LOOKUP             YES, TRY MATCH                      MBF02100
0B32  C510 0050          210          CLHI    R1,80              80 CHARS INPUT ?              **    MBF02110
0B36  038C               211          BNLR    R12                IF YES, ERROR                       MBF02120
0B38  2611               212          AIS     R1,1               BUMP BUFFER INDEX                   MBF02130
0B3A  4300 0B04          213          B       RDCHR              READ NEXT CHARACTER                 MBF02140
                         214  *  OPTION MATCH ROUTINE                                                 MBF02150
                         215  *                                                                       MBF02160
0B3E  C810 1558          216  LOOKUP  LDAI    R1,OPT             LOAD ADRS OF OPTION TABLE           MBF02170
0B42  0733               217  LOOK1   XAR     R3,R3              CLEAR BUFFER INDEX                  MBF02180
0B44  4851 0000          218          LH      R5,0(R1)                                               MBF02190
0B48  021C               219          BMR     R12                IF MINUS, THEN NO MATCH = ERROR     MBF02200
0B4A  0861               220          LDAR    R6,R1              SET OPTION WORD INDEX               MBF02210
0B4C  D346 0000          221  LOOK2   LB      R4,0(R6)           GET BYTE FROM TABLE                 MBF02220
0B50  D443 22EA          222          CLB     R4,OPTBUF(R3)      COMPARE WITH INPUT                  MBF02230
0B54  2138               223          BNES    LOOK21                                                 MBF02240
0B56  C540 0020          224          CLHI    R4,X'20'           BLANK IN TABLE ?                    MBF02250
0B5A  2338               225          BES     LOOK21                                                 MBF02260
0B5C  2631               226          AIS     R3,1                                                   MBF02270
0B5E  2661               227          AIS     R6,1                                                   MBF02280
0B60  C530 0006          228          CLHI    R3,6                                                   MBF02290
0B64  208C               229          BLS     LOOK2              TRY NEXT BYTE                       MBF02300
0B66  2631               230          AIS     R3,1                                                   MBF02310
0B68  230C               231          BS      LOOK32             TO GET VECTOR                       MBF02320
0B6A  D343 22EA          232  LOOK21  LB      R4,OPTBUF(R3)      LOOK AT INPUT BYTE                  MBF02330
0B6E  C540 0020          233          CLHI    R4,X'20'           INPUT BLANK ?                       MBF02340
0B72  2337               234          BES     LOOK32             TO GET VECTOR                       MBF02350
0B74  C540 000D          235          CLHI    R4,X'0D'           INPUT CR ?                          MBF02360
0B78  2334               236          BES     LOOK32             TO GET VECTOR                       MBF02370
0B7A  261C               237  LOOK22  AIS     R1,12              NO MATCH.                           MBF02380
0B7C  4300 0B42          238          B       LOOK1              TO TRY NEXT ENTRY                   MBF02390
0B80  C530 0006          239  LOOK32  CLHI    R3,6               FULL STRING ?                       MBF02400
0B84  2382               240          BNLS    LOOK33                                                 MBF02410
0B86  2631               241          AIS     R3,1               POINT TO OPERAND                    MBF02420
0B88  48F1 0008          242  LOOK33  LH      R15,8(R1)          GET TRANSFER VECTOR                 MBF02430
0B8C  40F0 1554          243          STA     R15,TESTS          **                                  MBF02440
0B90  C510 15C4          244          CLHI    R1,FORMAT          **                                  MBF02450
0B94  4380 0D38          245          BNL     RUNIT                                                  MBF02460
0B98  C510 1558          246          CLHI    R1,TEST                                                MBF02470
0B9C  4330 0D08          247          BE      TESTOP             ACCEPT DRIVE #                      MBF02480
0BA0  C510 1588          248          CLHI    R1,OPTION          OPTION CMD ?                        MBF02490
0BA4  4230 0C9C          249          BNE     LOOK4              NO, LOOK FURTHER                    MBF02500
                         250  *--------------------------                                            MBF02510
                         251  *  TO PROCESS INPUT COMMAND 'OPTION'                                    MBF02520
0BA8  4820 15C0          252          LH      R2,OPTION+8        CHECK FOR SPECIAL ROUTINE           MBF02530
0BAC  0232               253          BNZR    R2                 LINK TO ROUTINE                     MBF02540
0BAE  C830 1558          254  OPTRTN  LHI     R3,TEST            RETURN HERE                         MBF02550
0BB2  C8E0 0C38          255          LHI     R14,OPTCMD8                                            MBF02560
0BB6  41F0 10AE          256          BAL     LINK,CRLF                                              MBF02570
0BBA  0722               257  OPTCMD  XAR     R2,R2              RESET COUNTER                       MBF02580
0BBC  D342 1558          258  OPTCMD1 LB      R4,OPT(R2)         TO PRINT TEST                       MBF02590
0BC0  41F0 10BC          259          BAL     LINK,OUTCHR                                            MBF02600
```

```
0BC4  2621           260          AIS   R2,1                                          MBF02610
0BC6  C520 0006      261          CLHI  R2,6                                          MBF02620
0BCA  2087           262          BLS   OPTCMD1                                       MBF02630
0BCC  C840 0020      263          LHI   R4,C' '                                       MBF02640
0BD0  41F0 10BC      264          BAL   LINK,OUTCHR       OUTPUT 1 SPACE              MBF02650
0BD4  0755           265          XAR   R5,R5             TO PRINT SELECTED TEST NUMBERS MBF02660
0BD6  4050 149E      266          STH   R5,FIRST                                      MBF02670
0BDA  4823 0006      267          LH    R2,6(R3)          FIRST TEST WORD             MBF02680
0BDE  2440           268 OPTCMD2  LIS   R4,0               START WITH TEST 0           MBF02690
0BE0  4040 233C      269          STH   R4,TEMP                                       MBF02700
0BE4  9121           270 OPTCMD3  SLHLS R2,1                                          MBF02710
0BE6  4380 0C18      271          BNC   OPTCMD7                                       MBF02720
0BEA  4040 233C      272 OPTCMD4  STH   R4,TEMP           OPTION VALUE FOUND.         MBF02730
0BEE  4800 149E      273          LH    R0,FIRST          IS IT FIRST ?               MBF02740
0BF2  2335           274          BZS   OPTCMD5                                       MBF02750
0BF4  C840 002C      275          LHI   R4,C','           NO, OUTPUT COMMA            MBF02760
0BF8  41F0 10BC      276          BAL   LINK,OUTCHR                                   MBF02770
0BFC  40F0 149E      277 OPTCMD5  STH   LINK,FIRST                                    MBF02780
0C00  0855           278          LDAR  R5,R5             TEST VALUE FROM SECOND HW   MBF02790
0C02  2335           279          BZS   OPTCMD6           NO                          MBF02800
0C04  C840 0031      280          LHI   R4,C'1'           YES,OUTPUT '1'              MBF02810
0C08  41F0 10BC      281          BAL   LINK,OUTCHR                                   MBF02820
0C0C  4840 233C      282 OPTCMD6  LH    R4,TEMP           RESTORE R4                  MBF02830
0C10  D344 14E6      283          LB    R4,HEXTAB(R4)     CONVERT                     MBF02840
0C14  41F0 10BC      284          BAL   LINK,OUTCHR       OUTPUT 0-F                  MBF02850
0C18  4840 233C      285 OPTCMD7  LH    R4,TEMP           RESTORE                     MBF02860
0C1C  2641           286          AIS   R4,1              INCREMENT TEST #            MBF02870
0C1E  4040 233C      287          STH   R4,TEMP                                       MBF02880
0C22  C540 0010      288          CLHI  R4,16                                         MBF02890
0C26  4280 0BE4      289          BL    OPTCMD3                                       MBF02900
0C2A  0855           290 OPTCMD71 LHR   R5,R5             DONE ?                      MBF02910
0C2C  023E           291          BNZR  R14                                           MBF02920
0C2E  4823 0008      292          LH    R2,8(R3)          SECOND TEST WORD            MBF02930
0C32  2451           293          LIS   R5,1              R5 = 1 FOR SECOND TEST HW   MBF02940
0C34  4300 0BDE      294          B     OPTCMD2                                       MBF02950
                     295 *---------------------------------                          MBF02960
                     296 *  TO OUTPUT OTHER OPTION NAMES & VALUES                    MBF02970
                     297 *                                                           MBF02980
0C38  41F0 10AE      298 OPTCMD8  BAL   LINK,CRLF                                    MBF02990
0C3C  2461           299          LIS   R6,1              SET LINE COUNTER            MBF03000
0C3E  C820 1564      300          LHI   R2,OPT+12         R2 POINTS TO THE NAME       MBF03010
0C42  0733           301 OPTCMD9  XAR   R3,R3                                         MBF03020
0C44  4852 0006      302          LH    R5,6(R2)          R5 = OPTION VALUE           MBF03030
0C48  D342 0000      303 OPTCMD10 LB    R4,0(R2)                                      MBF03040
0C4C  41F0 10BC      304          BAL   LINK,OUTCHR       OUTPUT OPTION NAME CHAR     MBF03050
0C50  2621           305          AIS   R2,1                                          MBF03060
0C52  2631           306          AIS   R3,1                                          MBF03070
0C54  C530 0006      307          CLHI  R3,6              6 CHARACTERS OUTPUT ?       MBF03080
0C58  2088           308          BLS   OPTCMD10          NO,LOOP                     MBF03090
0C5A  C840 0020      309          LHI   R4,C' '                                       MBF03100
0C5E  41F0 10BC      310          BAL   LINK,OUTCHR       OUTPUT ONE SPACE            MBF03110
0C62  2404           311          LIS   R0,4                                          MBF03120
0C64  41F0 0F94      312          BAL   LINK,R5HEX        WRITE OPTION VALUE IN HEX (4 DIGITS) MBF03130
0C68  4800 14B6      313          LH    R0,PASFLG         CONSOLE ON PASLA ?          MBF03140
```

```
0C6C  233D           314          BZS   OPTCMD12          BRANCH IF NO.                          MBF03150
0C6E  2661           315          AIS   R6,1              INCREMENT LINE COUNTER.                MBF03160
0C70  C560 0014      316          CLHI  R6,20             PAGE FULL ?                            MBF03170
0C74  2189           317          BLS   OPTCMD12         NO                                     MBF03180
0C76  0766           318          XAR   R6,R6            INITIALIZE LINE COUNT                  MBF03190
0C78  41F0 1130      319 OPTCMD11 BAL   LINK,GETCHR                                              MBF03200
0C7C  274D           320          SIS   R4,13             CR ?                                   MBF03210
0C7E  4330 0AE2      321          BZ    OPTIN             TO ACCEPT NEXT COMMAND                 MBF03220
0C82  2643           322          AIS   R4,3              LF ?                                   MBF03230
0C84  2036           323          BNZS  OPTCMD11          IF YES, PRINT NEXT PAGE                MBF03240
0C86  41F0 10AE      324 OPTCMD12 BAL   LINK,CRLF                                                MBF03250
0C8A  41F0 1176      325          BAL   LINK,TSTBRK       EXIT IF 'BREAK' PRESSED.               MBF03260
0C8E  2626           326          AIS   R2,6                                                     MBF03270
0C90  C520 15B8      327          CLHI  R2,OPTEND2        ALL PRINTING OPTIONS DONE ?            MBF03280
0C94  4280 0C42      328          BL    OPTCMD9           NO,LOOP FOR NEXT ONE                   MBF03290
0C98  4300 0AE6      329          B     OPTINI            TO ACCEPT NEXT COMMAND                 MBF03300
                     330 *-----------------------------                                          MBF03310
                     331 *  TO PROCESS COMMANDS OTHER THAN 'TEST', 'OPTION'.                     MBF03320
                     332 *                                                                       MBF03330
      0000 0C9C      333 LOOK4    EQU   *                                                        MBF03340
0C9C  41E0 0F6A      334          BAL   R14,OPTVAL        GET OPTION VALUE IN R6                 MBF03350
0CA0  274D           335          SIS   R4,13             TERMINATED BY CR ?                     MBF03360
0CA2  023C           336          BNZR  R12               IF NO, BRANCH                          MBF03370
0CA4  48E1 0008      337          LH    R14,8(R1)         GET OPTION CHECK ROUTINE ADDRESS       MBF03380
0CA8  2332           338          BZS   LOOK5                                                    MBF03390
0CAA  01FE           339          BALR  R15,R14           LINK OPTION CHECK ROUTINE              MBF03400
      0000 0CAC      340 LOOK5    EQU   *                 RETURN HERE                            MBF03410
0CAC  4061 0006      341          STH   R6,6(R1)          STORE OPTION VALUE                     MBF03420
0CB0  4300 0AE2      342          B     OPTIN             TO ACCEPT NEXT COMMAND                 MBF03430
                     343 *                                                                       MBF03440
0CB4  C360 FFFE      344 ZERONE   THI   R6,X'FFFE'        IGNORE LSB                             MBF03450
0CB8  033F           345          BZR   R15               OKAY                                   MBF03460
0CBA  030C           346          BR    R12               ERROR RETURN                           MBF03470
                     347 *                                                                       MBF03480
0CBC  C560 0400      348 ADR      CLHI  R6,X'400'         (R6) = 10 BIT DEVICE ADDRESS           MBF03490
0CC0  028F           349          BLR   R15               RETURN TO LOOK5                        MBF03500
0CC2  030C           350          BR    R12                                                      MBF03510
                     351 *                                                                       MBF03520
0CC4  C560 000F      352 LEVEL    CLHI  R6,15             (R6) = INTERRUPT LEVEL HEX DIGIT       MBF03530
0CC8  028F           353          BLR   R15               RETURN TO LOOK5                        MBF03540
0CCA  030C           354          BR    R12                                                      MBF03550
                     355 *--------------------------------                                       MBF03560
                     356 * TO CHECK THAT OPTION ENTRY IN R6 IS IN DECIMAL DIGITS.                 MBF03570
                     357 * TO CONVERT DECIMAL ENTRY IN R6 TO HEX VALUE AND                        MBF03580
                     358 * STORE IT @ 0(R5).                                                     MBF03590
                     359 *                                                                       MBF03600
0CCC  D000 2348      360 DECHEX   STM   R0,RSAVE                                                 MBF03610
0CD0  2400           361          LIS   R0,0              ACCUMULATOR                            MBF03620
0CD2  2410           362          LIS   R1,0              TABLE INDEX                            MBF03630
0CD4  2420           363          LIS   R2,0              SHIFT COUNTER                          MBF03640
0CD6  0836           364 DECLP1   LDAR  R3,R6             COPY INPUT VALUE                       MBF03650
0CD8  CC32 0000      365          SRAL  R3,0(R2)                                                 MBF03660
0CDC  4330 0CFE      366          BZ    DECHEX1           TO RETURN                              MBF03670
0CE0  C430 000F      367          NHI   R3,15                                                    MBF03680
```

EXEC - ETPE R03P0 (DEPOPULATED)

```
0CE4  C530 000A      368          CLHI   R3,10          VALID DECIMAL DIGIT ?          MBF03690
0CE8  038C           369          BNLR   R12            IF NOT, ERROR,                 MBF03700
0CEA  4871 14DC      370          LDA    R7,DECTAB(R1)  1,10,...,10000                 MBF03710
0CEE  2731           371 DECLP2   SIS    R3,1                                          MBF03720
0CF0  2113           372          BMS    DECLP3                                        MBF03730
0CF2  0A07           373          AAR    R0,R7          ADD IN CURRENT VALUE           MBF03740
0CF4  2203           374          BS     DECLP2                                        MBF03750
0CF6  2624           375 DECLP3   AIS    R2,4           INCREMENT SHIFTER              MBF03760
0CF8  2612           376          AIS    R1,ADC         INCREMENT POINTER              MBF03770
0CFA  4300 0CD6      377          B      DECLP1                                        MBF03780
0CFE  4005 0000      378 DECHEX1  STH    R0,0(R5)       STORE HEX OPTION VALUE         MBF03790
0D02  D100 2348      379          LM     R0,RSAVE                                      MBF03800
0D06  030F           380          BR     LINK           RETURN                         MBF03810
                     381 *---------------------------                                  MBF03820
                     382 *  TEST OPTION PROCESS ROUTINE                                MBF03830
                     383 *                                                             MBF03840
      0000 0D08      384 TESTOP   EQU    *                                             MBF03850
0D08  4850 1550      385 TSTOP1   LH     R5,MAXTST                                     MBF03860
0D0C  2470           386          LIS    R7,0           TEST BIT ACCUMULATORS          MBF03870
0D0E  41E0 0F6A      387 TSTOP2   BAL    R14,OPTVAL     GET OPTION VALUE IN R6         MBF03880
0D12  0556           388          CLAR   R5,R6                                         MBF03890
0D14  028C           389          BLR    R12            ERROR: INVALID TEST NUMBER     MBF03900
0D16  2481           390          LIS    R8,1                                          MBF03910
0D18  C560 000F      391 TSTOP25  CLHI   R6,15                                         MBF03920
0D1C  2384           392          BNLS   TSTOP3                                        MBF03930
0D1E  0A88           393          AAR    R8,R8                                         MBF03940
0D20  2661           394          AIS    R6,1                                          MBF03950
0D22  2205           395          BS     TSTOP25                                       MBF03960
0D24  0678           396 TSTOP3   OAR    R7,R8                                         MBF03970
0D26  274D           397          SIS    R4,13                                         MBF03980
0D28  2334           398          BZS    TSTOP4                                        MBF03990
0D2A  2631           399          AIS    R3,1                                          MBF04000
0D2C  4300 0D0E      400          B      TSTOP2         IF NOT CR, CONTINUE            MBF04010
0D30  4070 155E      401 TSTOP4   STH    R7,TEST+6                                     MBF04020
0D34  4300 0AE2      402          B      OPTIN          TO ACCEPT NEXT COMMAND         MBF04030
                     403 *---------------------------                                  MBF04040
                     404 *                                                             MBF04050
      0000 0D38      405 RUNIT    EQU    *                                             MBF04060
0D38  41F0 10AE      406          BAL    LINK,CRLF                                     MBF04070
0D3C  41F0 1924      407          BAL    LINK,INIT      LINK USER INITIALIZATION ROUTINE MBF04080
      0000 0D40      408 INITRET  EQU    *              RETURN HERE                    MBF04090
0D40  24F0           409          LIS    R15,0                                         MBF04100
0D42  2440           410          LIS    R4,0                                          MBF04110
0D44  4814 15EA      411          LH     R1,DEVSADR(R4)                                MBF04120
0D48  4210 0D6E      412          BM     KEEP0                                         MBF04130
0D4C  9D10           413          SSR    R1,R0                                         MBF04140
0D4E  2704           414          SIS    R0,4                                          MBF04150
0D50  213C           415          BNZS   INSYS                                         MBF04160
0D52  2403           416 OUTSYS   LIS    R0,3                                          MBF04170
0D54  C820 1700      417          LHI    R2,OUSYS+4                                    MBF04180
0D58  41F0 0FBE      418          BAL    R15,HEXASC                                    MBF04190
0D5C  C850 16FC      419          LHI    R5,OUSYS                                      MBF04200
0D60  4050 14D0      420          STH    R5,ISITERR                                    MBF04210
0D64  41F0 101E      421          BAL    R15,PRINT                                     MBF04220
```

EXEC - ETPE R03P0 (DEPOPULATED)

```
0D68 2642          422 INSYS   AIS   R4,2                                  MBF04230
0D6A 4300 0D44     423         B     INITRET+4                             MBF04240
0D6E 08FF          424 KEEP0   LDAR  R15,R15                               MBF04250
0D70 4230 0AE2     425         BNZ   OPTIN                                 MBF04260
0D74 40F0 14DA     426         STH   R15,WASDU1                            MBF04270
                   427 *  RESET TEST PARAMETERS                            MBF04280
                   428 *                                                   MBF04290
0D78 0700          429         XAR   R0,R0                                 MBF04300
0D7A 4000 14D0     430         STH   R0,ISITERR      RESET ERROR FLAG      MBF04310
0D7E 4000 14D8     431         STH   R0,WASDU                              MBF04320
0D82 C810 3030     432         LHI   R1,C'00'                              MBF04330
0D86 4010 14FE     433         STH   R1,ERRNO                              MBF04340
0D8A 41F0 1280     434         BAL   LINK,LCORE      SET UP LOW CORE       MBF04350
                   435 *                                                   MBF04360
                   436 *  START SELECTION FROM TEST 0                      MBF04370
                   437 *                                                   MBF04380
0D8E 0700          438 KEEP3   XAR   R0,R0                                 MBF04390
0D90 4000 14D6     439         STH   R0,BTESTNO                            MBF04400
0D94 240F          440         LIS   R0,15                                 MBF04410
0D96 4810 155E     441         LH    R1,TEST+6                             MBF04420
0D9A 9011          442 KEEP2   SRLS  R1,1                                  MBF04430
0D9C 2185          443         BCS   FOUND1                                MBF04440
0D9E 2701          444         SIS   R0,1                                  MBF04450
0DA0 2213          445         BNMS  KEEP2                                 MBF04460
0DA2 4300 18A0     446         B     ERROR6          INVALID  DRIVE OPTION MBF04470
0DA6 4000 14D4     447 FOUND1  STH   R0,SELTST                             MBF04480
0DAA 4810 14D6     448         LH    R1,BTESTNO                            MBF04490
0DAE 4910 14D4     449 K42     CH    R1,SELTST                             MBF04500
0DB2 4220 0AE2     450         BP    OPTIN           SEQUENCE COMPLETE     MBF04510
0DB6 4010 14D6     451         STH   R1,BTESTNO                            MBF04520
                   452 *                                                   MBF04530
0DBA 2408          453         LIS   R0,8                                  MBF04540
0DBC 910C          454         SLLS  R0,12           R0 = 8000             MBF04550
0DBE CC01 0000     455         SRHL  R0,0(R1)        POSITION CURSOR       MBF04560
0DC2 4820 155E     456         LH    R2,TEST+6                             MBF04570
0DC6 C302 0000     457         THI   R0,0(R2)        THIS DRIVE TO BE SELECTED ? MBF04580
0DCA 2134          458         BNZS  K43             BRANCH: YES.          MBF04590
0DCC 2611          459         AIS   R1,1                                  MBF04600
0DCE 4300 0DAE     460         B     K42             CONTINUE DRIVE SCAN   MBF04610
                   461 *                                                   MBF04620
0DD2 4800 156A     462 K43     LH    R0,DISCON+6                           MBF04630
0DD6 CA01 0001     463         AHI   R0,1(R1)        COMPUTE DRIVE'S ADRS  MBF04640
0DDA 4000 169A     464         STH   R0,FUTADRS                            MBF04650
0DDE C820 1800     465         LDAI  R2,MSG12+6                            MBF04660
0DE2 2401          466         LIS   R0,1                                  MBF04670
0DE4 41F0 0FBE     467         BAL   R15,HEXASC                            MBF04680
0DE8 41F0 11F4     468         BAL   R15,SETKB       SELECT CONSOLE DEVICE MBF04690
0DEC C850 17FA     469         LHI   R5,MSG12                              MBF04700
0DF0 41F0 101E     470         BAL   R15,PRINT       'DRIVE X SELECTED'    MBF04710
0DF4 4800 0A10     471         LH    R0,IO                                 MBF04720
0DF8 4000 233A     472         STH   R0,IOSAVE       RESTORE USER'S IO CHOICE MBF04730
0DFC 9300          473         LBR   R0,R0                                 MBF04740
0DFE D400 0A10     474         CLB   R0,IO                                 MBF04750
0E02 2333          475         BES   KEEP6           BRANCH IF LISTING ON CONSOLE MBF04760
```

EXEC - ETPE R03P0 (DEPOPULATED)

```
0E04  41F0 101E      476          BAL   R15,PRINT          COPY MESSAGE TO LIST DEVICE          MBF04770
0E08  4810 0A20      477  KEEP6   LH    R1,PSW             ENABLE INTERRUPTS                    MBF04780
0E0C  9501           478          EPSR  R0,R1                                                   MBF04790
0E0E  4810 1554      479          LDA   R1,TESTS           **                                   MBF04800
0E12  0301           480          BR    R1                 GO TO TEST MODULE                    MBF04810
                     481  *-----------------------------                                        MBF04820
                     482  *                                                                     MBF04830
                     483  *  TEST MODULE END ROUTINE                                            MBF04840
                     484  *                                                                     MBF04850
      0000 0E14      485  TSTEND  EQU   *                                                       MBF04860
0E14  4810 0A22      486          LH    R1,PSW2                                                MBF04870
0E18  9501           487          EPSR  R0,R1              DISABLE INT @ PROCESSOR LEVEL        MBF04880
0E1A  4810 14D6      488          LH    R1,BTESTNO                                             MBF04890
0E1E  2611           489          AIS   R1,1                                                   MBF04900
0E20  4300 0DAE      490          B     K42                CONTINUE DRIVE SCAN                  MBF04910
                     491  * ********************************                                    MBF04920
                     492  *                                                                     MBF04930
                     493  *  ERROR ROUTINES                 (OVERRIDE NOMSG OPTION)              MBF04940
                     494  *                                                                     MBF04950
0E24  D000 2408      495  ERR     STM   R0,ERRSAVE         STORE REGISTERS                      MBF04960
0E28  4120 0EAE      496          BAL   R2,ERRCOM          RETURN IF LIST DEVICE IS ON          MBF04970
0E2C  41E0 0ECE      497          BAL   RET,ERR1           PRINT 'ERROR TTNN'                   MBF04980
0E30  0700           498  ERRCOM2 XAR   R0,R0                                                  MBF04990
0E32  4000 14D0      499          STH   R0,ISITERR         RESET ERROR FLAG                     MBF05000
0E36  4820 0A20      500          LH    R2,PSW                                                 MBF05010
0E3A  9502           501          EPSR  R0,R2                                                  MBF05020
0E3C  D100 2408      502          LM    R0,ERRSAVE         RESTORE REGISTERS                    MBF05030
0E40  030F           503          BR    LINK               RETURN TO TEST                       MBF05040
0E42  D000 2408      504  ERRD    STM   R0,ERRSAVE         STORE REGISTERS                      MBF05050
0E46  4120 0EAE      505          BAL   R2,ERRCOM          RETURN IF LIST DEVICE IS ON          MBF05060
0E4A  41E0 0ECE      506          BAL   RET,ERR1           PRINT 'ERROR TTNN'                   MBF05070
0E4E  41E0 0ED8      507          BAL   RET,ERRD1          PRINT 'DEV DDD'                      MBF05080
0E52  4300 0E30      508          B     ERRCOM2                                                MBF05090
0E56  D000 2408      509  ERRS    STM   R0,ERRSAVE         STORE REGISTERS                      MBF05100
0E5A  4120 0EAE      510          BAL   R2,ERRCOM          RETURN IF LIST DEVICE IS ON          MBF05110
0E5E  41E0 0ECE      511          BAL   RET,ERR1           PRINT 'ERROR TTNN'                   MBF05120
0E62  41E0 0EF0      512          BAL   RET,ERRS1          PRINT 'STA SS'                       MBF05130
0E66  4300 0E30      513          B     ERRCOM2                                                MBF05140
0E6A  D000 2408      514  ERRDS   STM   R0,ERRSAVE         STORE REGISTERS                      MBF05150
0E6E  4120 0EAE      515          BAL   R2,ERRCOM          RETURN IF LIST DEVICE IS ON          MBF05160
0E72  41E0 0ECE      516          BAL   RET,ERR1           PRINT 'ERROR TTNN'                   MBF05170
0E76  41E0 0F08      517          BAL   RET,ERRDS1         PRINT 'DEV DDD STA SS'               MBF05180
0E7A  4300 0E30      518          B     ERRCOM2                                                MBF05190
0E7E  D000 2408      519  ERRL    STM   R0,ERRSAVE         STORE REGISTERS                      MBF05200
0E82  40F0 14AE      520          STH   R15,OLOC           STORE ERROR LOC TO PRINT             MBF05210
0E86  4120 0EAE      521          BAL   R2,ERRCOM          RETURN IF LIST DEVICE IS ON          MBF05220
0E8A  41E0 0ECE      522          BAL   RET,ERR1           PRINT 'ERROR TTNN'                   MBF05230
0E8E  41E0 0F2E      523          BAL   RET,ERRL1          PRINT 'LOC LLLL'                     MBF05240
0E92  4300 0E30      524          B     ERRCOM2                                                MBF05250
0E96  D000 2408      525  ERRALL  STM   R0,ERRSAVE         STORE REGISTERS                      MBF05260
0E9A  4120 0EAE      526          BAL   R2,ERRCOM          RETURN IF LIST DEVICE IS ON          MBF05270
0E9E  41E0 0ECE      527          BAL   RET,ERR1           PRINT 'ERROR TTNN'                   MBF05280
0EA2  41E0 0F08      528          BAL   RET,ERRDS1         PRINT 'DEV DDD STA SS'               MBF05290
0EA6  41E0 0F46      529          BAL   RET,ERRPL1         PRINT 'PSW PPPP  LOC LLLL'           MBF05300
```

```
0EAA  4300 0E30          530          B       ERRCOM2                                          MBF05310
                         531  *                                                                MBF05320
                         532  *  COMMON ERROR ROUTINE                                         MBF05330
                         533  *                                                                MBF05340
0EAE  4020 0EC8          534  ERRCOM  STH     R2,COMRET                                        MBF05350
0EB2  4810 0A22          535          LH      R1,PSW2                                          MBF05360
0EB6  9501               536          EPSR    R0,R1           DISABLE INT. @ PROCESSOR LEVEL   MBF05370
0EB8  41F0 11B2          537          BAL     LINK,ISTDU      GET LIST DEVICE DU BIT IN R1     MBF05380
0EBC  2137               538          BNZS    ERRCOM1         BRANCH IF OFF-LINE               MBF05390
0EBE  4020 14D0          539          STH     R2,ISITERR      SET ERROR FLAG                   MBF05400
0EC2  4020 14D2          540          STH     R2,NOERR                                         MBF05410
0EC6  4300 0EC6          541          B       *               GO, PRINT ERROR MESSAGE          MBF05420
      0000 0EC8          542  COMRET  EQU     *-2                                              MBF05430
                         543  *                                                                MBF05440
0ECA  4300 0AE2          544  ERRCOM1 B       OPTIN                                            MBF05450
                         545  *-----------------------------                                   MBF05460
                         546  * MESSAGE PRINT ROUTINES        (DO NOT OVERRIDE NOMSG OPTION)   MBF05470
                         547  *                                                                MBF05480
                         548  *  TO PRINT 'ERROR TTNN'                                         MBF05490
                         549  *                                                                MBF05500
0ECE  C850 14F6          550  ERR1    LHI     R5,ERRMSG                                        MBF05510
0ED2  41F0 101E          551          BAL     LINK,PRINT      PRINT 'ERROR TTNN'               MBF05520
                         552  *                               TT = TEST #, NN = ERROR #        MBF05530
0ED6  030E               553          BR      R14             RETURN                           MBF05540
                         554  *                                                                MBF05550
                         555  *  TO PRINT 'DEV DDD'                                            MBF05560
                         556  *                                                                MBF05570
0ED8  2403               557  ERRD1   LIS     R0,3            SET UP DIGITS = 3                MBF05580
0EDA  4810 14B0          558          LH      R1,ERRDEV       R1 = ERROR DEV # IN BINARY       MBF05590
0EDE  C820 1518          559          LHI     R2,ASCIDEV2                                      MBF05600
0EE2  41F0 0FBE          560          BAL     LINK,HEXASC     CONVERT IT TO ASCII              MBF05610
0EE6  C850 1514          561          LHI     R5,DEVMSG2                                       MBF05620
0EEA  41F0 101E          562          BAL     LINK,PRINT      PRINT 'DEV DD'                   MBF05630
0EEE  030E               563          BR      RET             RETURN                           MBF05640
                         564  *                                                                MBF05650
                         565  *  TO PRINT 'STA SS'                                             MBF05660
                         566  *                                                                MBF05670
0EF0  2402               567  ERRS1   LIS     R0,2            SET UP DIGITS = 2                MBF05680
0EF2  D310 14B2          568          LB      R1,ERRSTA       R1 = ERROR STATUS                MBF05690
0EF6  C820 150E          569          LHI     R2,ASCISTA                                       MBF05700
0EFA  41F0 0FBE          570          BAL     LINK,HEXASC     CONVERT IT TO ASCII              MBF05710
0EFE  C850 150A          571          LHI     R5,STAMSG                                        MBF05720
0F02  41F0 101E          572          BAL     LINK,PRINT      PRINT 'STA SS'                   MBF05730
0F06  030E               573          BR      RET             RETURN                           MBF05740
                         574  *                                                                MBF05750
                         575  *  TO PRINT 'DEV DDD STA SS'                                     MBF05760
                         576  *                                                                MBF05770
0F08  2403               577  ERRDS1  LIS     R0,3            SET UP DIGITS = 3                MBF05780
0F0A  4810 14B0          578          LH      R1,ERRDEV       R1 = ERROR DEV #                 MBF05790
0F0E  C820 1506          579          LHI     R2,ASCIDEV                                       MBF05800
0F12  41F0 0FBE          580          BAL     LINK,HEXASC     CONVERT IT TO ASCII              MBF05810
0F16  2402               581          LIS     R0,2            SET UP DIGITS = 2                MBF05820
0F18  D310 14B2          582          LB      R1,ERRSTA       R1 = ERROR STATUS                MBF05830
0F1C  C820 150E          583          LHI     R2,ASCISTA                                       MBF05840
```

```
0F20  41F0 0FBE   584          BAL   LINK,HEXASC       CONVERT IT TO ASCII                  MBF05850
0F24  C850 1502   585          LHI   R5,DEVMSG                                            MBF05860
0F28  41F0 101E   586          BAL   LINK,PRINT        PRINT 'DEV DD STA SS'                MBF05870
0F2C  030E        587          BR    RET               RETURN                               MBF05880
                  588  *                                                                   MBF05890
                  589  *  TO PRINT 'LOC LLLL'                                              MBF05900
                  590  *                                                                   MBF05910
0F2E  2404        591  ERRL1   LIS   R0,4              SET UP DIGITS = 4                    MBF05920
0F30  4810 14AE   592          LH    R1,OLOC           R1= OLD LOC                          MBF05930
0F34  C820 152C   593          LHI   R2,ASCILOC                                           MBF05940
0F38  41F0 0FBE   594          BAL   LINK,HEXASC       CONVERT IT TO ASCII                  MBF05950
0F3C  C850 1528   595          LHI   R5,LOCMSG                                            MBF05960
0F40  41F0 101E   596          BAL   LINK,PRINT        PRINT 'LOC LLLL'                     MBF05970
0F44  030E        597          BR    RET               RETURN                               MBF05980
                  598  *                                                                   MBF05990
                  599  *  TO PRINT 'PSW PPPP  LOC LLLL'                                    MBF06000
                  600  *                                                                   MBF06010
0F46  2404        601  ERRPL1  LIS   R0,4              SET UP DIGITS = 4                    MBF06020
0F48  4810 14AA   602          LH    R1,OPSW           R1 = OLD PSW                         MBF06030
0F4C  C820 1522   603          LHI   R2,ASCIPSW                                           MBF06040
0F50  41F0 0FBE   604          BAL   LINK,HEXASC       CONVERT IT TO ASCII                  MBF06050
0F54  4810 14AE   605          LH    R1,OLOC           R1= OLD LOC                          MBF06060
0F58  C820 152C   606          LHI   R2,ASCILOC                                           MBF06070
0F5C  41F0 0FBE   607          BAL   LINK,HEXASC       CONVERT IT TO ASCII                  MBF06080
0F60  C850 151E   608          LHI   R5,PSWMSG                                            MBF06090
0F64  41F0 101E   609          BAL   LINK,PRINT        PRINT 'PSW PPPP  LOC LLLL'           MBF06100
0F68  030E        610          BR    RET               RETURN                               MBF06110
                  611  * ********************************                                  MBF06120
                  612  *  TO OBTAIN OPTION VALUE IN R6                                     MBF06130
                  613  *                                                                   MBF06140
0F6A  0766        614  OPTVAL  XAR   R6,R6              INITIALIZE ACCUMULATOR               MBF06150
0F6C  D343 22EA   615  OPTVAL0 LB    R4,OPTBUF(R3)                                        MBF06160
0F70  C540 000D   616          CLHI  R4,X'0D'          CARRIAGE RETURN ?                    MBF06170
0F74  033E        617          BER   R14                                                  MBF06180
0F76  C540 002C   618          CLHI  R4,X'2C'          COMMA ?                              MBF06190
0F7A  033E        619          BER   R14                                                  MBF06200
0F7C  24FF        620          LIS   R15,15                                               MBF06210
0F7E  D44F 14E6   621  OPTVAL1 CLB   R4,HEXTAB(R15)     SCAN TABLE                           MBF06220
0F82  2334        622          BES   OPTVAL2             MATCH                            MBF06230
0F84  27F1        623          SIS   R15,1                                                MBF06240
0F86  2214        624          BNMS  OPTVAL1                                              MBF06250
0F88  030C        625          BR    R12               ERROR: VALUE NOT IN TABLE.           MBF06260
0F8A  9164        626  OPTVAL2 SLLS  R6,4               SHIFT LEFT 4                         MBF06270
0F8C  066F        627          OAR   R6,R15              OR IN CURRENT DIGIT                  MBF06280
0F8E  2631        628  OPTVAL3 AIS   R3,1                                                 MBF06290
0F90  4300 0F6C   629          B     OPTVAL0                                              MBF06300
                  630  *--------------------------                                       MBF06310
                  631  *  R5HEX PRINTS CONTENTS OF R5 IN HEX                             MBF06320
                  632  *        PRINTS UPTO 4 DIGITS                                     MBF06330
                  633  *                                                                   MBF06340
0F94  D000 2348   634  R5HEX   STM   R0,RSAVE           STORE REGISTERS                      MBF06350
0F98  0820        635          LDAR  R2,R0               R2 = # OF DIGITS TO BE PRINTED       MBF06360
0F9A  2721        636          SIS   R2,1                                                 MBF06370
0F9C  4210 0FB8   637          BM    R5XB                                                 MBF06380
```

EXEC - ETPE R03P0 (DEPOPULATED)

```
0FA0  9122           638          SLLS  R2,2              R2 = 4(DIGITS-1)                MBF06390
0FA2  0845           639  R5X     LDAR  R4,R5                                           MBF06400
0FA4  CC42 0000      640          SRAL  R4,0(R2)                                        MBF06410
0FA8  C440 000F      641          NHI   R4,15             R4 = HEX DIGIT                  MBF06420
0FAC  D344 14E6      642          LB    R4,HEXTAB(R4)                                   MBF06430
0FB0  41F0 10BC      643  R5XA    BAL   R15,OUTCHR                                      MBF06440
0FB4  2724           644          SIS   R2,4                                            MBF06450
0FB6  221A           645          BNMS  R5X               LOOP TILL ALL DIGITS            MBF06460
0FB8  D100 2348      646  R5XB    LM    R0,RSAVE          RESTORE REGISTERS               MBF06470
0FBC  030F           647          BR    LINK              RETURN                          MBF06480
                     648  *-------------------------                                    MBF06490
                     649  *  TO CONVERT BINARY DATA IN R1 INTO ASCII CHAR & STORE @ 0(R2)  MBF06500
                     650  *                                                             MBF06510
0FBE  D000 2348      651  HEXASC  STM   R0,RSAVE          STORE REGISTERS                 MBF06520
0FC2  0830           652          LDAR  R3,R0             R3 = DIGITS                     MBF06530
0FC4  9132           653          SLLS  R3,2                                            MBF06540
0FC6  2734           654          SIS   R3,4              R3 = 4(DIGITS)-4                MBF06550
0FC8  0841           655  HEXASC1 LDAR  R4,R1             R4 = HEX DATA                   MBF06560
0FCA  CC43 0000      656          SRAL  R4,0(R3)                                        MBF06570
0FCE  C440 000F      657          NHI   R4,15             R4 = HEX DIGIT TO BE CONVERTED  MBF06580
0FD2  D344 14E6      658          LB    R4,HEXTAB(R4)                                   MBF06590
0FD6  D242 0000      659          STB   R4,0(R2)          STORE ASCII CHAR                MBF06600
0FDA  2621           660          AIS   R2,1                                            MBF06610
0FDC  2734           661          SIS   R3,4                                            MBF06620
0FDE  221B           662          BNMS  HEXASC1           LOOP TILL ALL DIGITS            MBF06630
0FE0  D100 2348      663          LM    R0,RSAVE          RESTORE REGISTERS               MBF06640
0FE4  030F           664          BR    LINK              RETURN                          MBF06650
                     665  *-------------------------                                    MBF06660
                     666  *  TO CONVERT BINARY DATA IN R1 INTO DECIMAL DIGITS            MBF06670
                     667  *     AND STORE THEM IN ASCII @ 0(R2)                         MBF06680
                     668  *                                                             MBF06690
0FE6  D000 2348      669  DECASC  STM   R0,RSAVE                                        MBF06700
0FEA  0830           670          LDAR  R3,R0             COPY DIGIT COUNT                MBF06710
0FEC  9131           671          SLLS  R3,LADC           &ESTABLISH DECTAB INDEX.        MBF06720
0FEE  2732           672          SIS   R3,ADC                                          MBF06730
0FF0  0744           673  $DEC1   XAR   R4,R4             CLEAR MODULUS COUNTER           MBF06740
0FF2  4853 14DC      674          LDA   R5,DECTAB(R3)     LOAD LARGEST REQ. POWER OF 10.  MBF06750
0FF6  0515           675  $DEC2   CLAR  R1,R5             EXCEEDS TEST VALUE ?            MBF06760
0FF8  2188           676          BLS   $DEC3             BRANCH IF YES.                  MBF06770
0FFA  0B15           677          SAR   R1,R5             DECREMENT TEST VALUE            MBF06780
0FFC  2641           678          AIS   R4,1              INCREMENT MODULUS COUNTER       MBF06790
0FFE  C540 000A      679          CLHI  R4,10             VALID DECIMAL DIGIT ?           MBF06800
1002  2086           680          BLS   $DEC2             BRANCH IF YES; ELSE             MBF06810
1004  274A           681          SIS   R4,10             FORCE VALID DIGIT,              MBF06820
1006  2208           682          BS    $DEC2             REPEAT DECREMENT.               MBF06830
1008  D344 14E6      683  $DEC3   LB    R4,HEXTAB(R4)     CONVERT MODULUS COUNT TO ASCII  MBF06840
100C  D242 0000      684          STB   R4,0(R2)          AND STORE AT DESTINATION MSB.   MBF06850
1010  2621           685          AIS   R2,1              INCREMENT DESTINATION POINTER   MBF06860
1012  2732           686          SIS   R3,ADC            DECREMENT DECTAB POINTER        MBF06870
1014  4310 0FF0      687          BNM   $DEC1             FALL THROUGH ON DECTAB UNDERFLOW. MBF06880
1018  D100 2348      688          LM    R0,RSAVE          RESTORE USER'S REGISTERS        MBF06890
101C  030F           689          BR    LINK              RETURN.                         MBF06900
                     690  *-------------------------                                    MBF06910
                     691  *  TO PRINT THE ASCII MESSAGE                                 MBF06920
```

```
                                692  *                                                                    MBF06930
101E  D000 2348                 693  PRINT    STM     R0,RSAVE          STORE REGISTERS                  MBF06940
1022  D310 233B                 694           LB      R1,IOSAVE+1       GET LIST IDENTIFIER              MBF06950
1026  2711                      695           SIS     R1,1              CRT ?                            MBF06960
1028  2338                      696           BZS     P4CRT                                              MBF06970
102A  2713                      697           SIS     R1,3              CAROUSEL ?                       MBF06980
102C  213A                      698           BNZS    P6                                                 MBF06990
102E  D300 0A19                 699           LB      R0,C300ADR+1                                       MBF07000
1032  DE00 14C8                 700           OC      R0,CAR2ND                                          MBF07010
1036  2305                      701           BS      P6                                                 MBF07020
1038  D300 0A13                 702  P4CRT    LB      R0,PASLADR+1                                       MBF07030
103C  DE00 14C7                 703           OC      R0,CRT2ND                                          MBF07040
1040  41F0 11B2                 704  P6       BAL     LINK,TSTDU                                         MBF07050
1044  2335                      705           BZS     P1                                                 MBF07060
1046  4010 14D8                 706           STH     R1,WASDU          SET FLAG                         MBF07070
104A  4300 10A4                 707           B       PRINT5            EXIT                             MBF07080
104E  4820 14D8                 708  P1       LH      R2,WASDU                                           MBF07090
1052  4330 107C                 709           BZ      P3                                                 MBF07100
1056  C810 0140                 710           LHI     R1,X'140'         SET TIME DELAY                   MBF07110
105A  C800 1000                 711           LHI     R0,X'1000'                                         MBF07120
105E  2701                      712           SIS     R0,1                                               MBF07130
1060  2031                      713           BTBS    3,1                                                MBF07140
1062  2711                      714           SIS     R1,1                                               MBF07150
1064  2035                      715           BTBS    3,5               LOOP TILL TIMEOUT                MBF07160
1066  0744                      716           XAR     R4,R4                                              MBF07170
1068  4040 14D8                 717           STH     R4,WASDU                                           MBF07180
106C  2541                      718           LCS     R4,1              CHARACTER = X'FF'                MBF07190
106E  4040 14DA                 719           STH     R4,WASDU1                                          MBF07200
1072  2434                      720           LIS     R3,4                                               MBF07210
1074  41F0 10BC                 721  P2       BAL     LINK,OUTCHR                                        MBF07220
1078  2731                      722           SIS     R3,1                                               MBF07230
107A  2023                      723           BPS     P2                                                 MBF07240
      0000 107C                 724  P3       EQU     *                                                  MBF07250
                                725  *                                                                    MBF07260
107C  D345 0000                 726  PRINT2   LB      R4,0(R5)          GET A MESSAGE BYTE               MBF07270
1080  41F0 10BC                 727           BAL     LINK,OUTCHR       OUTPUT IT                        MBF07280
1084  274D                      728           SIS     R4,13             CR ?                             MBF07290
1086  2333                      729           BZS     PRINT3            MSG OVER                         MBF07300
1088  2651                      730           AIS     R5,1                                               MBF07310
108A  2207                      731           BS      PRINT2            LOOP FOR NEXT CHAR               MBF07320
108C  244A                      732  PRINT3   LIS     R4,10             LF                               MBF07330
108E  D310 233B                 733           LB      R1,IOSAVE+1       GET LIST DEV IDENTIFIER          MBF07340
1092  2713                      734           SIS     R1,3              LINE PRINTER ?                   MBF07350
1094  2335                      735           BZS     PRINT3A           BRANCH IF YES.                   MBF07360
1096  41F0 10BC                 736           BAL     LINK,OUTCHR       LF                               MBF07370
109A  2541                      737           LCS     R4,1              DEL                              MBF07380
109C  2302                      738           BS      PRINT3B                                            MBF07390
109E  2441                      739  PRINT3A  LIS     R4,1              YES, OUTPUT X'01'                MBF07400
10A0  41F0 10BC                 740  PRINT3B  BAL     LINK,OUTCHR       TERMINAL CHARACTER               MBF07410
10A4  41F0 1176                 741  PRINT5   BAL     LINK,TSTBRK                                        MBF07420
10A8  D100 2348                 742           LM      R0,RSAVE          RESTORE REGISTERS                MBF07430
10AC  030F                      743           BR      LINK              RETURN                           MBF07440
                                744  *--------------------------------                                  MBF07450
                                745  *  SMALL SUPPORT ROUTINES                                          MBF07460
```

```
                                746 *                                                                   MBF07470
                                747 *  TO OUTPUT CR,LF TO LIST DEVICE                                   MBF07480
                                748 *                                                                   MBF07490
10AE   D000 2348                749 CRLF    STM     R0,RSAVE        STORE REGISTERS                     MBF07500
10B2   244D                     750         LIS     R4,13                                               MBF07510
10B4   41F0 108C                751         BAL     LINK,OUTCHR     OUTPUT CR                           MBF07520
10B8   4300 108C                752         B       PRINT3          LINE FEED, RESTORE, RETURN          MBF07530
                                753 *---------------------------                                       MBF07540
                                754 *  TO OUTPUT A CHARACTER TO THE LIST DEVICE                         MBF07550
108C   40F0 112C                755 OUTCHR  STH     R15,OUT1+2      SAVE RETURN ADDRESS                 MBF07560
10C0   D300 233B                756         LB      R0,IOSAVE+1                                         MBF07570
10C4   2704                     757         SIS     R0,4                                                MBF07580
10C6   4230 1104                758         BNZ     OUTCHR2         BRANCH IF NO TRANS PAUSE            MBF07590
10CA   4000 112E                759         STH     R0,PAUSE        RESET FLAG                          MBF07600
10CE   41F0 11B2                760 OTC.0   BAL     LINK,TSTDU      ON-LINE ?                           MBF07610
10D2   4230 1126                761         BNZ     OUT0            BRANCH IF NO.                       MBF07620
10D6   9D01                     762         SSR     R0,R1           CHARACTER TO READ ?                 MBF07630
10D8   2386                     763         BFFS    8,OTC.2         BRANCH IF YES                       MBF07640
10DA   4810 112E                764 OTC.1   LH      R1,PAUSE        PAUSED NOW ?                        MBF07650
10DE   2038                     765         BNZS    OTC.0           BRANCH: YES, WAIT FOR DC2           MBF07660
10E0   4300 1104                766         B       OUTCHR2         PRESS ON                            MBF07670
10E4   9B01                     767 OTC.2   RDR     R0,R1           DC2, DC4 (FDX ONLY) ?               MBF07680
10E6   C410 007F                768         NHI     R1,X'7F'                                            MBF07690
10EA   CB10 0012                769         SHI     R1,X'12'        DC2 ?                               MBF07700
10EE   2134                     770         BNZS    OTC.3                                               MBF07710
10F0   4010 112E                771         STH     R1,PAUSE        RESET FLAG                          MBF07720
10F4   2308                     772         BS      OUTCHR2         PRESS ON                            MBF07730
10F6   2712                     773 OTC.3   SIS     R1,2            DC4 ?                               MBF07740
10F8   4230 10CE                774         BNZ     OTC.0           NO.                                 MBF07750
10FC   40F0 112E                775         STH     LINK,PAUSE      SET FLAG                            MBF07760
1100   4300 10CE                776         B       OTC.0           AND WAIT FOR DC2                    MBF07770
1104   41F0 11B2                777 OUTCHR2 BAL     LINK,TSTDU      OFF-LINE ?                          MBF07780
1108   213F                     778         BNZS    OUT0            IF YES.                             MBF07790
110A   4110 123A                779         BAL     R1,SETUP        SET UP FOR OUTPUT                   MBF07800
110E   9D01                     780 OTC.4   SSR     R0,R1           WAIT FOR NOT BUS4                   MBF07810
1110   213B                     781         BTFS    3,OUT0          BRANCH IF OFF-LINE                  MBF07820
1112   C510 000C                782         CLHI    R1,12                                               MBF07830
1116   2338                     783         BES     OUT0                                                MBF07840
1118   C310 0008                784         THI     R1,8                                                MBF07850
111C   2037                     785         BNZS    OTC.4                                               MBF07860
111E   9A04                     786         WDR     R0,R4           OUTPUT DATA BYTE                    MBF07870
1120   9D01                     787         SSR     R0,R1                                               MBF07880
1122   2081                     788         BTBS    8,1                                                 MBF07890
1124   2303                     789         BS      OUT1                                                MBF07900
1126   4010 14D8                790 OUT0    STH     R1,WASDU        SET FLAG                            MBF07910
112A   4300 112A                791 OUT1    B       *               RETURN AS SET UP ABOVE              MBF07920
112E   0000                     792 PAUSE   DCX     0               SET DURING TRANSMISSION PAUSE       MBF07930
                                793 *---------------------------                                       MBF07940
                                794 *  TO GET A CHAR FROM KEYBOARD (IN REG R4)                          MBF07950
                                795 *                                                                   MBF07960
1130   4140 1202                796 GETCHR  BAL     R4,KBREAD       PUT KB DEVICE IN READ MODE          MBF07970
1134   9D04                     797         SSR     R0,R4                                               MBF07980
1136   021F                     798         BTCR    1,LINK          IF DU, RETURN                       MBF07990
1138   2082                     799         BTBS    8,2             IF BUSY, LOOP                       MBF08000
```

```
113A 9B04          800          RDR   R0,R4              READ A CHAR IN R4          MBF08010
                   801  * TO ECHO RECEIVED CHARACTERS TO CONSOLE DEVICE IN FOX MODE  MBF08020
113C D390 14BA     802  ECHO    LB    R9,CONRD                                      MBF08030
1140 C590 00A9     803          CLHI  R9,X'A9'           CAROUSEL ?                 MBF08040
1144 2137          804          BNES  ECHRTN             DO NOT ECHO                MBF08050
1146 D390 14B9     805          LB    R9,CONADR+1                                   MBF08060
114A DD90 14B3     806          SS    R9,SINK                                       MBF08070
114E 2082          807          BTBS  8,2                                           MBF08080
1150 9A94          808          WDR   R9,R4              ECHO RECEIVED BYTE         MBF08090
1152 C440 007F     809  ECHRTN  NHI   R4,X'7F'           REMOVE PARITY BIT          MBF08100
1156 030F          810          BR    LINK               RETURN                     MBF08110
                   811  *-------------------------                                  MBF08120
                   812  *  TO OUTPUT '?' TO CONSOLE                                 MBF08130
                   813  *                                                          MBF08140
1158 41F0 11F4     814  QUESTN  BAL   LINK,SETKB                                    MBF08150
115C 41F0 10AE     815          BAL   LINK,CRLF                                     MBF08160
1160 40F0 14D0     816          STH   LINK,ISITERR       SET FLAG                   MBF08170
1164 C850 154C     817          LHI   R5,QMSG                                       MBF08180
1168 41F0 101E     818          BAL   LINK,PRINT         PRINT '?'                  MBF08190
116C 0700          819          XAR   R0,R0                                         MBF08200
116E 4000 14D0     820          STH   R0,ISITERR                                    MBF08210
1172 4300 0AE6     821          B     OPTIN1             TO ACCEPT COMMAND INPUT    MBF08220
                   822  *-------------------------                                  MBF08230
                   823  *  IF 'BREAK' PRESSED,GOTO 'OPTIN', OTHERWISE RETURN        MBF08240
                   824  *                                                          MBF08250
1176 D000 2388     825  TSTBRK  STM   R0,RSAVE+64        STORE REGISTERS            MBF08260
117A D300 14B8     826          LB    R0,CONADR          GET KEYBOARD DEVICE ADR    MBF08270
117E 9D01          827          SSR   R0,R1                                         MBF08280
1180 C310 0020     828          THI   R1,X'20'           'BREAK' KEY PRESSED ?      MBF08290
1184 4330 11AC     829          BZ    TSTBRK3            NO. EXIT                   MBF08300
1188 4820 14B6     830          LH    R2,PASFLG          PASLA ?                    MBF08310
118C 233A          831          BZS   TSTBRK1           BRANCH IF NO.              MBF08320
118E C310 0008     832          THI   R1,8               ALREADY ACKNOWLEDGED ?     MBF08330
1192 213D          833          BNZS  TSTBRK3            BRANCH : YES.              MBF08340
1194 9B02          834          RDR   R0,R2                                         MBF08350
1196 9D01          835          SSR   R0,R1                                         MBF08360
1198 2281          836          BFBS  8,1                                           MBF08370
119A 0822          837          LDAR  R2,R2                                         MBF08380
119C 2138          838          BNZS  TSTBRK3                                       MBF08390
119E 2305          839          BS    TSTBRK2                                       MBF08400
11A0 9D01          840  TSTBRK1 SSR   R0,R1                                         MBF08410
11A2 C310 0020     841          THI   R1,X'20'                                      MBF08420
11A6 2033          842          BTBS  3,3                WAIT FOR BREAK KEY RELEASE MBF08430
11A8 4300 0AE2     843  TSTBRK2 B     OPTIN              TO ACCEPT COMMAND INPUT    MBF08440
11AC D100 2388     844  TSTBRK3 LM    R0,RSAVE+64        RESTORE REGISTERS          MBF08450
11B0 030F          845          BR    LINK               RETURN TO PROGRAM          MBF08460
                   846  *-------------------------                                  MBF08470
                   847  * SEE IF LIST DEVICE OFF-LINE (R1, CC NON-ZERO IF OFF)     MBF08480
                   848  *                                                          MBF08490
11B2 0310 233B     849  TSTDU   LB    R1,IOSAVE+1        GET LIST DEV IDENTIFIER    MBF08500
11B6 2711          850          SIS   R1,1               CRT/PASLA ?                MBF08510
11B8 213D          851          BNZS  TSTDU1             BRANCH IF NO.              MBF08520
11BA D300 0A12     852  TSTDU0  LB    R0,PASLADR                                    MBF08530
11BE 9D01          853          SSR   R0,R1                                         MBF08540
```

```
11C0  C410 00FC   854          NHI   R1,X'FC'                                  MBF08550
11C4  C510 000C   855          CLHI  R1,12             BSY & EX SET ?          MBF08560
11C8  2133        856          BTFS  3,3               BRANCH IF NOT OFF-LINE  MBF08570
11CA  0811        857          LDAR  R1,R1             SET CONDITION CODE      MBF08580
11CC  030F        858          BR    LINK              DEVICE OFF-LINE         MBF08590
11CE  0711        859          XAR   R1,R1                                       MBF08600
11D0  030F        860          BR    LINK              RETURN                  MBF08610
11D2  D300 0A14   861  TSTDU1  LB    R0,CLIFADR                                MBF08620
11D6  2711        862          SIS   R1,1              CURRENT LOOP ?          MBF08630
11D8  233A        863          BZS   TSTDU2            BRANCH IF YES.          MBF08640
11DA  D300 0A16   864          LB    R0,LPADR                                  MBF08650
11DE  2711        865          SIS   R1,1              LP ?                    MBF08660
11E0  2336        866          BZS   TSTDU2            BRANCH IF YES.          MBF08670
11E2  2711        867          SIS   R1,1              CAROUSEL 300 ?          MBF08680
11E4  4330 11BA   868          BZ    TSTDU0            BRANCH IF YES.          MBF08690
11E8  4200 11E8   869          NOP   *                 PROVISION TO ADD SPECIAL DEVICE  MBF08700
11EC  9D01        870  TSTDU2  SSR   R0,R1             GET STATUS IN R1        MBF08710
11EE  C410 0001   871          NHI   R1,1              R1 = DU BIT             MBF08720
11F2  030F        872          BR    LINK              RETURN                  MBF08730
                  873  * ------------------------------                         MBF08740
                  874  * TO DIRECT INPUT AND OUTPUT TO CONSOLE DEVICE           MBF08750
                  875  *                                                       MBF08760
11F4  D300 0A10   876  SETKB   LB    R0,IO             GET KEYBOARD DEVICE     MBF08770
11F8  9410        877          EXBR  R1,R0                                     MBF08780
11FA  0610        878          OAR   R1,R0                                     MBF08790
11FC  4010 233A   879          STH   R1,IOSAVE         KB DEVICE = LIST DEVICE MBF08800
1200  030F        880          BR    LINK              RETURN                  MBF08810
                  881  *--------------------------                            MBF08820
                  882  *  TO PUT KEYBOARD DEVICE IN READ MODE                  MBF08830
                  883  *                                                       MBF08840
1202  D300 14B8   884  KBREAD  LB    R0,CONADR                                 MBF08850
1206  DE00 14BA   885          OC    R0,CONRD                                  MBF08860
120A  4890 14B6   886          LH    R9,PASFLG         PASLA ?                 MBF08870
120E  4200 0000   887          NOP   FOR               SPECIAL KB DEVICE       MBF08880
1212  0334        888  TTYGET  BZR   R4                RETURN                  MBF08890
1214  DB00 14B3   889  CRTGET  RD    R0,SINK           DUMMY READ              MBF08900
1218  DE00 14C6   890          OC    R0,CONRQ2S                                MBF08910
121C  0304        891          BR    R4                RETURN                  MBF08920
                  892  *--------------------------                            MBF08930
                  893  *  TO SET UP KEYBOARD DEV TO READ WITH INT ENABLED      MBF08940
                  894  *                                                       MBF08950
121E  D000 2348   895  KBRD    STM   R0,RSAVE          SAVE REGISTERS          MBF08960
1222  D300 14B8   896          LB    R0,CONADR         GET KB DEV ADR          MBF08970
1226  4810 14B6   897          LH    R1,PASFLG         PASLA ?                 MBF08980
122A  2333        898          BZS   KBRD1                                     MBF08990
122C  DE00 14C6   899          OC    R0,CONRQ2S                                MBF09000
1230  DE00 14BD   900  KBRD1   OC    R0,CONENRD        CONSOLE : ENABLE, READ  MBF09010
1234  D100 2348   901          LM    R0,RSAVE          RESTORE REGISTERS       MBF09020
1238  030F        902          BR    LINK              RETURN                  MBF09030
                  903  *--------------------------                            MBF09040
                  904  *  LIST DEVICE SET UP ROUTINE                           MBF09050
                  905  *                                                       MBF09060
123A  D300 233B   906  SETUP   LB    R0,IOSAVE+1       GET LIST DEV IDENTIFIER MBF09070
123E  2701        907          SIS   R0,1              PASLA ?                 MBF09080
```

```
1240 4330 1262          908          BZ     CRTDRV          YES, GO TO CRT DRIVER                  MBF09090
1244 2701               909          SIS    R0,1            CURRENT LOOP ?                         MBF09100
1246 2339               910          BZS    TTYDRV          YES, GO TO TTY DRIVER                  MBF09110
1248 2701               911          SIS    R0,1            LINE PRINTER ?                         MBF09120
124A 4330 1268          912          BZ     LPDRV                                                  MBF09130
124E 2701               913          SIS    R0,1            CAROUSEL 300 ?                         MBF09140
1250 4330 1272          914          BZ     CARDRV                                                 MBF09150
1254 4200 1254          915          NOP    *               PROVISION TO ADD SPECIAL DEVICE        MBF09160
1258 D300 0A15          916 TTYDRV   LB     R0,CLIFADR+1                                           MBF09170
125C DE00 14CB          917          OC     R0,CLIFWRT      WRITE COMMAND TO CURR. LP. INTERF.     MBF09180
1260 0301               918          BR     R1              RETURN                                 MBF09190
1262 D300 0A13          919 CRTDRV   LB     R0,PASLADR+1                                           MBF09200
1266 2308               920          BS     CONDRV                                                 MBF09210
1268 D300 0A16          921 LPDRV    LB     R0,LPADR                                               MBF09220
126C DE00 14C9          922          OC     R0,LPWRT        COMMAND TO LINE PRINTER                MBF09230
1270 0301               923          BR     R1              RETURN                                 MBF09240
1272 D300 0A19          924 CARDRV   LB     R0,C300ADR+1                                           MBF09250
1276 DE00 14C1          925 CONDRV   OC     R0,CARWRT                                              MBF09260
127A DE00 14C1          926          OC     R0,CARWRT                                              MBF09270
127E 0301               927          BR     R1              RETURN                                 MBF09280
                        928 * ***************************                                        MBF09290
                        929 *  LOW CORE SET UP ROUTINE                                             MBF09300
                        930 *                                                                      MBF09310
1280 0711               931 LCORE    XAR    R1,R1                                                  MBF09320
1282 2422               932          LIS    R2,2                                                   MBF09330
1284 C830 004E          933          LHI    R3,X'4E'                                               MBF09340
1288 0700               934          XAR    R0,R0                                                  MBF09350
128A 4001 0000          935 ZERO1    STH    R0,0(R1)                                               MBF09360
128E C110 128A          936          BXLE   R1,ZERO1        ZERO CORE FROM 0 THRU X'4F'            MBF09370
1292 C810 0080          937          LHI    R1,X'80'                                               MBF09380
1296 C830 00CE          938          LHI    R3,X'CE'                                               MBF09390
129A 4001 0000          939 ZERO2    STH    R0,0(R1)                                               MBF09400
129E C110 129A          940          BXLE   R1,ZERO2        ZERO CORE FROM X'80' THRU X'CF'        MBF09410
12A2 C800 139A          941          LHI    R0,XI32         INTERRUPT HANDLER ROUTINE              MBF09420
12A6 C830 08CE          942          LHI    R3,X'8CE'                                              MBF09430
12AA 4001 0000          943 ZERO3    STH    R0,0(R1)                                               MBF09440
12AE C110 12AA          944          BXLE   R1,ZERO3        SET UP INT SERVICE POINTER TABLE       MBF09450
12B2 C830 1450          945          LHI    R3,II                                                  MBF09460
12B6 4030 0036          946          STH    R3,X'36'        ILL INST INT NEW PSW LOC               MBF09470
12BA C840 146A          947          LHI    R4,MM                                                  MBF09480
12BE 4040 003E          948          STH    R4,X'3E'        M. M. INT NEW PSW LOC                  MBF09490
12C2 C830 141C          949          LHI    R3,AF                                                  MBF09500
12C6 4030 004E          950          STH    R3,X'4E'        ARITHMETIC FAULT NEW PSW LOC(32-BIT)   MBF09510
                        951 *                              FIXED PT DIVIDE FAULT NEW PSW LOC      MBF09520
12CA C840 2348          952          LHI    R4,RSAVE                                               MBF09530
12CE 4810 14A0          953          LH     R1,MOU32                                               MBF09540
12D2 4230 12F4          954          BNZ    LCORE32                                                MBF09550
                        955 *                                                                      MBF09560
                        956 *  SET UP LOW CORE FOR 16 BIT MACHINE                                  MBF09570
                        957 *                                                                      MBF09580
12D6 4040 0022          958          STH    R4,X'22'        REG SAVE POINTER                       MBF09590
12DA C830 140A          959          LHI    R3,FP                                                  MBF09600
12DE 4030 002E          960          STH    R3,X'2E'        FLOATING PT FAULT INT NEW PSW LOC      MBF09610
12E2 4850 0A22          961          LH     R5,PSW2                                                MBF09620
```

EXEC - ETPE R03P0 (DEPOPULATED)

```
12E6  4050 0044        962           STH   R5,X'44'          HW EXT INT NEW PSW STATUS          MBF09630
12EA  C850 138C        963           LHI   R5,XII6                                                MBF09640
12EE  4050 0046        964           STH   R5,X'46'          EXT INT NEW PSW LOC                MBF09650
12F2  030F             965           BR    LINK                                                   MBF09660
                       966 *                                                                      MBF09670
                       967 *  SET UP LOW CORE FOR 32 BIT MACHINE                                  MBF09680
                       968 *                                                                      MBF09690
12F4  4040 0086        969 LCORE32   STH   R4,X'86'          REG SAVE POINTER                   MBF09700
12F8  C840 2340        970           LHI   R4,PSWSAVE        PPF PSW SAVE AREA                  MBF09710
12FC  4040 0084        971           STH   R4,X'84'          .   POINTER                        MBF09720
1300  C830 1412        972           LHI   R3,RP                                                  MBF09730
1304  4030 0096        973           STH   R3,X'96'          RELOC/PROTECT INT NEW PSW LOC      MBF09740
1308  D310 1488        974           LB    R1,CONADR         LOAD CONSOLE I/O ADDRESS           MBF09750
130C  0A11             975           AAR   R1,R1                                                  MBF09760
130E  C800 132C        976           LHI   R0,KBINT0         R0 = A(KEYBOARD INT HANDLER)       MBF09770
1312  4001 00D0        977           STH   R0,X'D0'(R1)      STORE @  X'D0'+2(KB DEV ADR)       MBF09780
1316  0711             978           XAR   R1,R1             TO SET UP SERVICE POINTER TABLE    MBF09790
1318  C830 139A        979           LHI   R3,XI32                                                MBF09800
131C  4821 15EA        980 LCORE32A  LH    R2,DEVSADR(R1)    GET DEV ADR FROM TABLE             MBF09810
1320  021F             981           BMR   LINK              DONE, RETURN                       MBF09820
1322  0A22             982           AAR   R2,R2                                                  MBF09830
1324  4032 00D0        983           STH   R3,X'D0'(R2)      STORE @  X'D0'+2(DEV ADR)          MBF09840
1328  2612             984           AIS   R1,2                                                   MBF09850
132A  2207             985           BS    LCORE32A                                               MBF09860
                       986 *-------------------------------                                       MBF09870
                       987 *  KEYBOARD INTERRUPT HANDLER                                          MBF09880
                       988 *                                                                      MBF09890
132C  C330 0020        989 KBINT0    THI   R3,X'20'          IS BREAK KEY DEPRESSED ?           MBF09900
1330  4330 1358        990           BZ    KBINT1            NO                                 MBF09910
1334  4850 1486        991           LH    R5,PASFLG         CONSOLE ON PASLA ?                 MBF09920
1338  233B             992           BZS   KBINT0A           BRANCH IF NO.                      MBF09930
133A  9D23             993           SSR   R2,R3                                                 MBF09940
133C  2081             994           BTBS  8,1                                                    MBF09950
133E  9B24             995           RDR   R2,R4                                                  MBF09960
1340  9D23             996           SSR   R2,R3                                                  MBF09970
1342  2281             997           BFBS  8,1                                                    MBF09980
1344  0844             998           LDAR  R4,R4                                                  MBF09990
1346  4230 137A        999           BNZ   RETOPSW           IGNORE FRERR ONLY                  MBF10000
134A  4300 0AE2       1000 KBINT00   B     OPTIN                                                  MBF10010
134E  9D23            1001 KBINT0A   SSR   R2,R3                                                 MBF10020
1350  C330 0020       1002           THI   R3,X'20'                                               MBF10030
1354  2033            1003           BTBS  3,3               WAIT FOR BREAK KEY RLS             MBF10040
1356  2206            1004           BS    KBINT00           0 TO COMMAND MODE                  MBF10050
1358  4020 14B0       1005 KBINT1    STH   R2,INTDEV                                              MBF10060
135C  D230 14B2       1006           STB   R3,INTSTA                                              MBF10070
1360  4840 14A0       1007           LH    R4,MOD32                                               MBF10080
1364  2335            1008           BZS   KBINT2                                                 MBF10090
1366  4000 14AA       1009           STH   R0,OPSW           STORE OLD PSW OF 32-BIT PROCESSOR  MBF10100
136A  4010 14AE       1010           STH   R1,OLOC           IN ORDER TO RETURN BACK TO TEST    MBF10110
136E  9B24            1011 KBINT2    RDR   R2,R4                                                  MBF10120
1370  41F0 113C       1012           BAL   LINK,ECHO         ECHO RECEIVED BYTE                 MBF10130
1374  4890 14CE       1013           LH    R9,KBINT          IF ZERO,IGNORE; ELSE               MBF10140
1378  0239            1014           BNZR  R9                GO,PROCESS KB INT FURTHER          MBF10150
                      1015 * -------------------------------                                     MBF10160
```

```
                        1016  *  TO RETURN ON OLD PSW                                                    MBF10170
                        1017  *                                                                          MBF10180
137A  4890 14A0         1018  RETOPSW  LH     R9,MOD32                                                  MBF10190
137E  2135              1019           BNZS   RETOPSW1                                                  MBF10200
1380  D100 23C8         1020           LM     R0,INTSAV          RESTORE REGISTERS                     MBF10210
1384  C200 0040         1021           LPSW   X'40'              RETURN ON OLD PSW AFTER KB INT        MBF10220
1388  C200 14A8         1022  RETOPSW1 LPSW   OPSW32                                                    MBF10230
                        1023  * ***************************************************                     MBF10240
                        1024  *  EXTERNAL INTERRUPT HANDLER                                            MBF10250
138C  D000 23C8         1025  XI16     STM    R0,INTSAV          FOR 16-BIT PROCESSOR                  MBF10260
1390  9F23              1026           ACKR   R2,R3              ACKNOWLEDGE THE INTERRUPT             MBF10270
1392  D420 14B8         1027           CLB    R2,CONADR          FROM KEYBOARD DEVICE ?                MBF10280
1396  4330 132C         1028           BE     KBINTO                                                   MBF10290
                        1029  *                                                                         MBF10300
      0000 139A         1030  XI32     EQU    *                  FOR 32-BIT PROCESSOR                  MBF10310
139A  95AA              1031           EPSR   R10,R10            CAPTURE CURRENT PSW                   MBF10320
139C  40A0 14A2         1032           STH    R10,INTPSW                                               MBF10330
13A0  4020 14B0         1033           STH    R2,INTDEV          STORE INTERRUPTING DEVICE ADDRESS     MBF10340
13A4  4030 14B2         1034           STH    R3,INTSTA          STORE INTERRUPTING DEVICE STATUS      MBF10350
13A8  4850 14A0         1035           LH     R5,MOD32                                                 MBF10360
13AC  2135              1036           BNZS   XI32A                                                    MBF10370
13AE  4800 0040         1037           LH     R0,X'40'           16-BIT OLD PSW                        MBF10380
13B2  4810 0042         1038           LH     R1,X'42'                                                 MBF10390
13B6  4000 14AA         1039  XI32A    STH    R0,OPSW            STORE OLD PSW STATUS                  MBF10400
13BA  4010 14AE         1040           STH    R1,OLOC            STORE OLD PSW LOC                     MBF10410
13BE  0855              1041           LDAR   R5,R5              MOD32 = 0 ?                           MBF10420
13C0  233A              1042           BZS    XI16A              BRANCH IF YES.                        MBF10430
13C2  4820 0A22         1043           LH     R2,PSW2                                                  MBF10440
13C6  9512              1044           EPSR   R1,R2              SELECT USER REGISTER SET              MBF10450
13C8  D000 23C8         1045           STM    R0,INTSAV          SAVE USER REGISTERS                   MBF10460
13CC  4820 14B0         1046           LH     R2,INTDEV                                                MBF10470
13D0  48A0 14A2         1047           LH     R10,INTPSW                                               MBF10480
                        1048  *                                                                         MBF10490
13D4  0755              1049  XI16A    XAR    R5,R5                                                    MBF10500
13D6  4865 15EA         1050  XI1      LH     R6,DEVSADR(R5)     GET DEV ADRS FROM TABLE               MBF10510
13DA  4210 13FA         1051           BM     XIERR              TABLE OVERFLOW.                       MBF10520
13DE  0562              1052           CLAR   R6,R2              COMPARE INTERRUPTING DEVICE ADDRESS   MBF10530
13E0  2333              1053           BES    XI2                                                      MBF10540
13E2  2652              1054           AIS    R5,2                                                     MBF10550
13E4  2207              1055           BS     XI1                                                      MBF10560
13E6  4865 15F8         1056  XI2      LH     R6,DEVINT(R5)      GET INTERRUPT HANDLER ADDRESS         MBF10570
13EA  4330 13FA         1057           BZ     XIERR              INTERRUPT NOT EXPECTED                MBF10580
13EE  4060 13F8         1058           STH    R6,XIEXIT                                                MBF10590
                        1059  *                                                                         MBF10600
13F2  D100 23C8         1060  XI4      LM     R0,INTSAV          RESTORE FROM XI16/XI32 ENTRY          MBF10610
13F6  4300 13F6         1061  XI5      B      *                  AND GO TO INTERRUPT HANDLER           MBF10620
      0000 13F8         1062  XIEXIT   EQU    *-2                                                      MBF10630
                        1063  *--------------------------------                                       MBF10640
                        1064  *  EXTERNAL INTERRUPT ERROR ROUTINE                                      MBF10650
                        1065  *                                                                         MBF10660
13FA  C860 4634         1066  XIERR    LHI    R6,C'F4'           ERROR # F4                            MBF10670
13FE  4060 14FE         1067           STH    R6,ERRNO                                                 MBF10680
1402  41F0 0E96         1068           BAL    LINK,ERRALL        'ERROR XXF4', 'DEV DDD STA SS'        MBF10690
                        1069  *                                 'PSW PPPP  LOC LLLL'                  MBF10700
```

```
                                1070  *                                'PSW PPPP  LOC LLLL'          MBF10710
 1406   4300 0AE6               1071          B       OPTIN1           TO ENTER COMMAND MODE        MBF10720
                                1072  *-------------------------------                            MBF10730
                                1073  *  SPURIOUS INTERRUPT HANDLERS                               MBF10740
                                1074  *                                                            MBF10750
                                1075  *                                                            MBF10760
                                1076  *  FLOATING-PT ARITH FAULT INT TRAP  (16 BIT PROCESSOR)      MBF10770
                                1077  *                                                            MBF10780
        0000 140A               1078  FP      EQU     *                                            MBF10790
 140A   48E0 0028               1079          LH      R14,X'28'        OLD PSW (16-BIT PROCESSOR)   MBF10800
 140E   48F0 002A               1080          LH      R15,X'2A'        OLD LOC                      MBF10810
                                1081  *                                                            MBF10820
                                1082  *  RELOCATION/PROTECTION INT TRAP                            MBF10830
                                1083  *                                                            MBF10840
        0000 1412               1084  RP      EQU     *                                            MBF10850
 1412   C820 4635               1085          LHI     R2,C'F5'                                     MBF10860
 1416   4020 14FE               1086          STH     R2,ERRNO         SET ERROR # F5               MBF10870
 141A   230C                    1087          BS      COMM                                         MBF10880
                                1088  *                                                            MBF10890
                                1089  *  ARITHMETIC FAULT INT (32-BIT PROCESSOR) TRAP              MBF10900
                                1090  *  FIXED-PT DIVIDE FAULT INT (16-BIT PROCESSOR) TRAP         MBF10910
                                1091  *                                                            MBF10920
        0000 141C               1092  AF      EQU     *                                            MBF10930
 141C   C820 4631               1093          LHI     R2,C'F1'                                     MBF10940
 1420   4020 14FE               1094          STH     R2,ERRNO         SET ERROR # F1               MBF10950
 1424   4820 14A0               1095          LH      R2,MOD32                                     MBF10960
 1428   2135                    1096          BNZS    COMM                                         MBF10970
 142A   48E0 0048               1097          LH      R14,X'48'        OLD PSW (16-BIT PROCESSOR)   MBF10980
 142E   48F0 004A               1098          LH      R15,X'4A'        OLD LOC (16-BIT PROCESSOR)   MBF10990
 1432   40E0 14AA               1099  COMM    STH     R14,OPSW                                     MBF11000
 1436   40F0 14AE               1100          STH     R15,OLOC                                     MBF11010
 143A   4800 0A22               1101  COMM1   LH      R0,PSW2                                      MBF11020
 143E   9520                    1102          EPSR    R2,R0            NO INT. , REG SET 15        MBF11030
 1440   41F0 0E24               1103          BAL     LINK,ERR         PRINT 'ERROR XXFN'          MBF11040
 1444   40F0 14D0               1104          STH     LINK,ISITERR     FORCE PRINT                 MBF11050
 1448   41E0 0F46               1105          BAL     RET,ERRPL1       PRINT 'PSW PPPP  LOC LLLL'  MBF11060
 144C   4300 0AE6               1106          B       OPTIN1           ENTER COMMAND MODE          MBF11070
                                1107  *                                                            MBF11080
                                1108  *  ILLEGAL INSTRUCTION INTERRUPT TRAP                        MBF11090
                                1109  *                                                            MBF11100
        0000 1450               1110  II      EQU     *                                            MBF11110
 1450   C820 4632               1111          LHI     R2,C'F2'                                     MBF11120
 1454   4020 14FE               1112          STH     R2,ERRNO         SET ERROR # F2               MBF11130
 1458   4820 14A0               1113          LH      R2,MOD32                                     MBF11140
 145C   2135                    1114          BNZS    II32                                         MBF11150
 145E   48E0 0030               1115          LH      R14,X'30'        OLD PSW                     MBF11160
 1462   48F0 0032               1116          LH      R15,X'32'        OLD LOC                     MBF11170
 1466   4300 1432               1117  II32    B       COMM                                         MBF11180
                                1118  *                                                            MBF11190
                                1119  *  MACHINE MALFUNCTION INTERRUPT TRAP                        MBF11200
                                1120  *                                                            MBF11210
 146A   95AA                    1121  MM      EPSR    R10,R10          CAPTURE MMINT PSW           MBF11220
 146C   C820 4633               1122          LHI     R2,C'F3'                                     MBF11230
 1470   4020 14FE               1123          STH     R2,ERRNO         SET ERROR # F3               MBF11240
```

EXEC - ETPE R03P0 (DEPOPULATED)

```
1474 48E0 0022  1124          LH    R14,X'22'        OLD PSW ( 32-BIT PROCESSOR)      MBF11250
1478 48F0 0026  1125          LH    R15,X'26'        OLD LOC                          MBF11260
147C 4820 14A0  1126          LH    R2,MOD32                                          MBF11270
1480 2135       1127          BNZS  MM32                                              MBF11280
1482 48E0 0038  1128          LH    R14,X'38'        OLD PSW (16 BIT PROCESSOR)       MBF11290
1486 48F0 003A  1129          LH    R15,X'3A'        OLD LOC                          MBF11300
148A 40E0 14AA  1130  MM32    STH   R14,OPSW                                          MBF11310
148E 40F0 14AE  1131          STH   R15,OLOC                                          MBF11320
1492 C800 080F  1132          LHI   R0,X'080F'                                        MBF11330
1496 9104       1133          SLHLS R0,4             R0 = X'80F0'                     MBF11340
1498 9520       1134          EPSR  R2,R0            HALT PROCESSOR                   MBF11350
                1135  *                                                               MBF11360
                1136  *   WHEN EXE/RUN IS DEPRESSED, ERROR MSG IS PRINTED.           MBF11370
                1137  *                                                               MBF11380
149A 4300 143A  1138          B     COMM1                                             MBF11390
                1139  * ***************************                                 MBF11400
                1140  *  ETPE CONSTANTS & TABLES                                     MBF11410
                1141  *                                                               MBF11420
149E 0000       1142  FIRST   DCX   0                                                 MBF11430
14A0 0000       1143  MOD32   DCX   0                FLAG FOR 32-BIT M/C(NON-ZERO)    MBF11440
14A2 0000       1144  INTPSW  DCX   0                (FOR 32-BIT M/C ONLY)            MBF11450
14A8            1145          ALIGN 8                                                 MBF11460
                1146  *-----------------------                                      MBF11470
14A8 0000       1147  OPSW32  DCX   0                OLD PSW STORAGE AREA             MBF11480
14AA 0000       1148  OPSW    DCX   0                                                 MBF11490
14AC 0000       1149          DCX   0                                                 MBF11500
14AE 0000       1150  OLOC    DCX   0                                                 MBF11510
                1151  *-----------------------                                      MBF11520
14B0 0000       1152  INTDEV  DCX   0                INTERRUPTING DEV ADR             MBF11530
     0000 14B0  1153  ERRDEV  EQU   INTDEV           ERROR DEVICE #                   MBF11540
14B2 00         1154  INTSTA  DB    0                INTERRUPTING DEV STATUS          MBF11550
     0000 14B2  1155  ERRSTA  EQU   INTSTA           ERRONEOUS STATUS                 MBF11560
14B3 00         1156  SINK    DB    0                BIT BUCKET                       MBF11570
14B4 80         1157  NORM    DB    X'80'                                            MBF11580
14B5 40         1158  INCR    DB    X'40'                                            MBF11590
14B6 0000       1159  PASFLG  DCX   0                SET WHEN CONSOLE ON PASLA/PALM   MBF11600
14B8 0000       1160  CONADR  DCX   0                CONSOLE/KEYBOARD DEVICE ADDRESS  MBF11610
14BA 0000       1161  CONRD   DCX   0                                                 MBF11620
     0000 14BB  1162  CONWRT  EQU   CONRD+1                                          MBF11630
14BC 00         1163  CON2ND  DB    0                                                 MBF11640
14BD 00         1164  CONENRD DB    0                                                 MBF11650
14BE B9AB       1165  CRTRD   DCX   B9AB             CRT READ/WRITE COMMANDS          MBF11660
     0000 14BF  1166  CRTWRT  EQU   CRTRD+1                                          MBF11670
14C0 A9AB       1167  CARRD   DCX   A9AB             CAROUSEL 300 READ/WRITE COMMANDS MBF11680
     0000 14C1  1168  CARWRT  EQU   CARRD+1                                          MBF11690
14C2 69         1169  CARENRD DB    X'69'                                            MBF11700
14C3 79         1170  CRTENRD DB    X'79'                                            MBF11710
14C4 3B         1171  CRTRQ2S DB    X'3B'                                            MBF11720
14C5 23         1172  CARRQ2S DB    X'23'                                            MBF11730
14C6 00         1173  CONRQ2S DB    0                                                MBF11740
14C7 F8         1174  CRT2ND  DB    X'F8'            FORMAT COMMAND                  MBF11750
14C8 F0         1175  CAR2ND  DB    X'F0'                                            MBF11760
14C9 80         1176  LPWRT   DB    X'80'                                            MBF11770
14CA A4D8       1177  CLIFRD  DCX   A4D8                                             MBF11780
```

```
                0000 14CB          1178  CLIFWRT  EQU   CLIFRD+1                                                  MBF11790
14CC            64                 1179  CLIFNRD  DB    X'64'                                                     MBF11800
                                   1180  *                                                                       MBF11810
14CE            137A               1181  KBINT    DC    Z(RETUPSW)          KEYBOARD INT RETURN ADR              MBF11820
14D0            0000               1182  ISITERR  DCX   0                                                       MBF11830
14D2            0000               1183  NOERR    DCX   0                                                       MBF11840
14D4            0000               1184  SELTST   DCX   0                                                       MBF11850
14D6            0000               1185  BTESTNO  DCX   0                                                       MBF11860
14D8            0000               1186  WASDU    DCX   0                                                       MBF11870
14DA            0000               1187  WASDU1   DCX   0                                                       MBF11880
                                   1188  *                                                                       MBF11890
14DC            0001               1189  DECTAB   DC    1,10,100,1000,10000                                      MBF11900
14DE            000A
14E0            0064
14E2            03E8
14E4            2710
14E6            30313233           1190  HEXTAB   DB    C'0123456789ABCDEF'                                      MBF11910
                34353637
                38394142
                43444546
                                   1191  *-------------------------------                                        MBF11920
                                   1192  *  ETPE MESSAGES                                                        MBF11930
                                   1193  *                                                                       MBF11940
14F6            4552524F           1194  ERRMSG   DC    C'ERROR 00**',X'0D00'                                    MBF11950
                52203030
                2A2A
1500            0D00
                0000 14FE          1195  ERRNO    EQU   *-4                                                      MBF11960
1502            44455620           1196  DEVMSG   DC    C'DEV *** STA **  '                        ***           MBF11970
                2A2A2A20
                53544120
                2A2A2020
                0000 1506          1197  ASCIDEV  EQU   *-12                                                     MBF11980
                0000 150A          1198  STAMSG   EQU   *-8                                                      MBF11990
                0000 150E          1199  ASCISTA  EQU   *-4                                                      MBF12000
1512            0D00               1200             DC    X'0D00'             ***                               MBF12010
1514            44455620           1201  DEVMSG2  DC    C'DEV ***',X'0D00'                                       MBF12020
                2A2A2A20
151C            0D00
                0000 1518          1202  ASCIDEV2 EQU   *-6                                                      MBF12030
151E            50535720           1203  PSWMSG   DC    C'PSW ****  LOC ****',X'0D00'                           MBF12040
                2A2A2A2A
                20204C4F
                43202A2A
                2A2A
1530            0D00
                0000 1522          1204  ASCIPSW  EQU   *-16                                                     MBF12050
                0000 1528          1205  LOCMSG   EQU   *-10                                                     MBF12060
                0000 152C          1206  ASCILOC  EQU   *-6                                                      MBF12070
1532            494E5445           1207  INTLVLM  DC    C'INTERRUPTED IN LEVEL  *',X'0D00'                       MBF12080
                52525550
                54454420
                494E204C
                4556454C
```

EXEC - ETPE R03P0 (DEPOPULATED)

```
                20202A20
154A            0D00                                                                    MBF12090
                0000 1548       1208  ERRLVL  EQU   *-4                               MBF12100
154C            3F0D            1209  QMSG    DC    X'3F0D'                           MBF12110
154E            2A0D            1210  AMSG    DC    X'2A0D'                           MBF12120
1550            0003            1211  MAXTST  DCX   3          LAST DRIVE #           MBF12130
1554            0000 0000       1212  TESTS   DCY   0          VECTOR TO MODULE
```

```
                                1214  *-----------------------------                                    MBF12150
                                1215  *  OPTION/COMMAND TABLE                                          MBF12160
                                1216  *                                                                MBF12170
          0000 1558             1217  OPT       EQU     *                                              MBF12180
     1558 44524956              1218  TEST      DC      C'DRIVE ',X'0000',X'0000',X'0000'              MBF12190
          4520
     155E 0000
     1560 0000
     1562 0000
          0000 1558             1219  DRIVE     EQU     TEST                                           MBF12200
     1564 44495343              1220  DISCON    DC      C'DISCON',X'00FB',Z(ADR),X'0000'               MBF12210
          4F4E
     156A 00FB
     156C 0CBC
     156E 0000
     1570 53454C43              1221  SELCH     DC      C'SELCH ',X'00F0',Z(ADR),X'0000'  SELCH ADRS  MBF12220
          4820
     1576 00F0
     1578 0CBC
     157A 0000
     157C 50414354              1222  PACTYP    DC      C'PACTYP',X'0040',X'0000',X'0000' DEFAULT 40MB USER MBF12230
          5950
     1582 0040
     1584 0000
     1586 0000
     1588 464D5453              1223  FMTSEC    DC      C'FMTSEC',X'0001',Z(ZERONE),X'0000'            MBF12240
          4543
     158E 0001
     1590 0CB4
     1592 0000
     1594 4C4F4359              1224  LOCYL     DC      C'LOCYL ',X'FFFF',0,0                          MBF12250
          4C20
     159A FFFF
     159C 0000
     159E 0000
     15A0 48494359              1225  HICYL     DC      C'HICYL ',X'FFFF',0,0                          MBF12260
          4C20
     15A6 FFFF
     15A8 0000
     15AA 0000
     15AC 464D5457              1226  FMTWP     DC      C'FMTWP ',X'0000',Z(ZERONE),X'0000'            MBF12270
          5020
     15B2 0000
     15B4 0CB4
     15B6 0000
          0000 15B8             1227  OPTEND2   EQU     *                   END OF PRINTING OPTIONS    MBF12280
     15B8 4F505449              1228  OPTION    DC      C'OPTION',0,0,0                                MBF12290
          4F4E
     15BE 0000
     15C0 0000
     15C2 0000
     15C4 464F524D              1229  FORMAT    DC      C'FORMAT',X'0000',Z(FMT,MOD),X'0000'           MBF12300
          4154
     15CA 0000
     15CC 1C62
     15CE 0000
```

```
15D0  464C4147            1230  FLAG     DC     C'FLAG  ',X'0000',Z(FLG.MOD),X'0000'                MBF12310
      2020
15D6  0000
15D8  1F7E
15DA  0000
15DC  434C4541            1231  CLEAR.   DC     C'CLEAR ',X'0000',Z(CLR.MOD),X'0000'                MBF12320
      5220
15E2  0000
15E4  1FE8
15E6  0000
15E8  FFFF                1232           DC     -1                                                  MBF12330
      0000 15EA           1233  DEVSADR  EQU    *                INTERRUPTING DEVICES               MBF12340
15EA  0000                1234           DC     X'0'             SELCH                              MBF12350
15EC  0000                1235           DC     X'0'             CONTROLLER                         MBF12360
15EE  0000                1236           DC     X'0'             DRIVE 0                            MBF12370
15F0  0000                1237           DC     X'0'             DRIVE 1                            MBF12380
15F2  0000                1238           DC     X'0'             DRIVE 2                            MBF12390
15F4  0000                1239           DC     X'0'             DRIVE 3                            MBF12400
15F6  FFFF                1240           DC     X'FFFF'                                             MBF12410
      0000 15F8           1241  DEVINT   EQU    *                INTERRUPT VECTORS                  MBF12420
15F8                      1242           DO     6                                                   MBF12430
15F8  0000                1243           DC     X'0'                                                MBF12440
15FA  0000                1243           DC     X'0'                                                MBF12440
15FC  0000                1243           DC     X'0'                                                MBF12440
15FE  0000                1243           DC     X'0'                                                MBF12440
1600  0000                1243           DC     X'0'                                                MBF12440
1602  0000                1243           DC     X'0'                                                MBF12440
1604                      1244  INTLVL   DO     6                INTERRUPT LEVELS                   MBF12450
1604  00                  1245           DB     X'0'                                                MBF12460
1605  00                  1245           DB     X'0'                                                MBF12460
1606  00                  1245           DB     X'0'                                                MBF12460
1607  00                  1245           DB     X'0'                                                MBF12460
1608  00                  1245           DB     X'0'                                                MBF12460
1609  00                  1245           DB     X'0'                                                MBF12460
                          1246  *                                                                  MBF12470
                          1247  * REGISTER EQUATES                                                 MBF12480
                          1248  *                                                                  MBF12490
      0000 0005           1249  FUT      EQU    5                                                   MBF12500
      0000 0006           1250  DCAD     EQU    6                                                   MBF12510
      0000 0007           1251  SLAD     EQU    7                                                   MBF12520
      0000 0008           1252  SECT     EQU    8                                                   MBF12530
      0000 0009           1253  HEAD     EQU    9                                                   MBF12540
      0000 000A           1254  STAT     EQU    10                                                  MBF12550
      0000 000B           1255  TRACK    EQU    11                                                  MBF12560
                          1256  *                                                                  MBF12570
                          1257  * COMMAND BYTES                                                    MBF12580
                          1258  *                                                                  MBF12590
      0000 0002           1259  IDLE     EQU    2                                                   MBF12600
160A  08                  1260  RSTATT   DB     X'08'            40MB RESET GATED ATN               MBF12610
160B  04                  1261  RSTHED   DB     X'04'            40MB RESET HEAD REGISTER           MBF12620
160C  20                  1262  HEDCMD   DB     X'20'            SET HEAD                           MBF12630
160D  06                  1263  WCMD     DB     X'06'            CONTROLLER WRITE FORMAT            MBF12640
160E  48                  1264  STOP     DB     X'48'            SELCH STOP (EXTENDED)              MBF12650
160F  30                  1265  GOREAD   DB     X'30'            SELCH GO, READ                     MBF12660
1610  10                  1266  GOWRITE  DB     X'10'            SELCH GO, WRITE                    MBF12670
1611  05                  1267  RCMD     DB     X'05'            CONTROLLER READ FORMAT             MBF12680
```

```
1612  10                1268  CYLCMD   DB    X'10'              DRIVE SET CYLINDER                  MBF12690
1613  C2                1269  SEEK     DB    X'C2'              DRIVE SEEK                          MBF12700
1614  03                1270  RCHECK   DB    X'03'              CONTROLLER READ CHECK               MBF12710
1615  C8                1271  RESET    DB    X'C8'              CONTROLLER RESET                    MBF12720
1616  C1                1272  RESTOC   DB    X'C1'              DRIVE RESTORE                       MBF12730
1617  00                1273           DB    *                  END OF COMMAND BYTES                MBF12740


      0000 0001         1275  TABSIZ   EQU   1                  1 DISC TYPE SUPPORTED.              MBF12760
                        1276  *                                                                    MBF12770
      0000 1618         1277  SECTAB   EQU   *                  SECTORS/TRACK                       MBF12780
1618  0014              1278           DC    H'20',H'20',H'20'                                      MBF12790
161A  0014
161C  0014
      0000 161E         1279  HEDTAB   EQU   *                  HEADS/CYLINDER                      MBF12800
161E  0014              1280           DC    H'20',H'20',H'20'                                      MBF12810
1620  0014
1622  0014
      0000 1624         1281  CYLTAB   EQU   *                  CYLINDERS/PACK                      MBF12820
1624  0196              1282           DC    H'406',H'406',H'406'                                   MBF12830
1626  0196
1628  0196
      0000 162A         1283  INDXTAB  EQU   *                  PATTERN SELECT INDEX                MBF12840
162A  0006              1284           DC    H'6',H'6',H'6'                                         MBF12850
162C  0006
162E  0006
      0000 1630         1285  INCRTAB  EQU   *                  SECTOR ADVANCE INCREMENT            MBF12860
1630  0004              1286           DC    H'4',H'4',H'4'                                         MBF12870
1632  0004
1634  0004
      0000 1636         1287  SYNCTAB  EQU   *                  HEADER SYNC BYTE                    MBF12880
1636  030303            1288           DB    X'03',X'03',X'03'                                      MBF12890
1639  00                1289           DB    *                                                      MBF12900
      0000 163A         1290  GAPTAB   EQU   *                  HEADER GAP SIZE                     MBF12910
163A  002A              1291           DC    H'42',H'42',H'42'                                      MBF12920
163C  002A
163E  002A
      0000 1640         1292  LRECLTAB EQU   *                  LOGICAL RECORD LENGTH               MBF12930
1640  0100              1293           DC    H'256',H'256',H'256'                                   MBF12940
1642  0100
1644  0100
      0000 1646         1294  PRECLTAB EQU   *                  PHYSICAL RECORD LENGTH (FORMAT MODE) MBF12950
1646  0130              1295           DC    H'304',H'304',H'304'                                   MBF12960
1648  0130
164A  0130
      0000 164C         1296  TYPTAB   EQU   *                  SUPPORTED PACTYP ID'S               MBF12970
164C  404040            1297           DB    X'40',X'40',X'40'                                      MBF12980
1650                    1298           DSF   0                  ALIGN TABLE                         MBF12990
      0000 1650         1299  DATAB    EQU   *                  DATA PATTERNS USED                  MBF13000
1650  FFFF              1300           DCX   FFFF,DB6D,6DB6,B6DB.          40 MB SET                MBF13010
1652  DB6D
1654  6DB6
1656  B6DB
1658                    1301           DSF   0                                                      MBF13020
1658  0000              1302  WSA      DC    X'0',Z(WTF)                                            MBF13030
```

```
165A 2948
165C 0000                1303 WFA      DC    X'0',X'0'                                                  MBF13040
165E 0000
1660 0000                1304 RSA      DC    X'0',Z(ROF)                                                MBF13050
1662 2A7C
1664 0000                1305 RFA      DC    X'0',X'0'                                                  MBF13060
1666 0000
1668 0000 0000           1306 FLAGRET  DCY   0                SAVE                                     MBF13070
166C 0000 0000           1307 SKRTRY   DCY   0                SEEK ERROR RERUN ADRS                    MBF13080
1670 0000 0000           1308 FATAL    DCY   0                SET ON 'FATAL' ERROR                     MBF13090
1674 0000 0000           1309 LBN      DCY   0                LINEAR SECTOR POINTER                    MBF13100
1678 0000                1310 MAXSEC   DCX   0                SECTORS/TRACK                            MBF13110
167A 0000                1311 MAXHEAD  DCX   0                HEADS/CYLINDER                           MBF13120
167C 0000                1312 MAXCYL   DCX   0                CYLINDERS/PACK                           MBF13130
167E 0000                1313 MAXDEX   DCX   0                MAX DATA PATTERN INDEX                   MBF13140
1680 0000                1314 SKCNT    DCX   0                MAX SEEK RETRY COUNT                     MBF13150
1682 0000                1315 INCRMT   DCX   0                TDATA SECTOR ADVANCE                     MBF13160
1684 0000                1316 GAPSIZE  DCX   0                GAP2 SIZE                                MBF13170
1686 0000                1317 LRECL    DCX   0                NORMAL RECORD LENGTH                     MBF13180
1688 0000                1318 PRECL    DCX   0                FORMAT RECORD LENGTH                     MBF13190
168A 0000                1319 SYNC     DCX   0                SYNC2 BYTE                               MBF13200
168C 0000                1320 INDEX    DCX   0                POINTER INTO DATA TABLES                 MBF13210
168E 0000                1321 POINTER  DCX   0                DSTBL INDEX SAVE                         MBF13220
1690 0000                1322 CYLNUM   DCX   0                CURRENT CYLINDER ADRS                    MBF13230
1692 0000                1323 HEADNUM  DCX   0                CURRENT HEAD ADRS                        MBF13240
1694 0000                1324 SECTNUM  DCX   0                CURRENT SECTOR ADRS                      MBF13250
1696 0000                1325 DSTSIZ   DCX   0                DSTBL SIZE                               MBF13260
1698 0000                1326 LPCNT    DCX   0                FORMAT-READS COUNTER                     MBF13270
169A 0000                1327 FUTADRS  DCX   0                SELECTED DRIVE'S ADDRESS                 MBF13280
169C 0000                1328 PROTECT  DCX   0                WRITE-PROTECT HEADER BIT                 MBF13290


169E 434F4D4D            1330 TITLE    DC    C'COMMON 40MB DISC FORMATTER 06-208 R00'                   MBF13310
     4F4E2034
     304D4220
     44495343
     20464F52
     4D415454
     45522030
     362D3230
     38205230
     3020
16C4 0D0A                1331          DCX   D0A                                                        MBF13330
16C6 57484943            1332 MSG2     DC    C'WHICH DRIVE?',X'0D0A'                                    MBF13340
     48204452
     4956453F
16D2 0D0A
16D4 494C4C45            1333 MSG3     DC    C'ILLEGAL CYLINDER ADDRESS *** - CE PACK',X'0D0A'          MBF13350
     47414C20
     43594C49
     4E444552
     20414444
     52455353
     202A2A2A
     202D2043
```

```
                45205041
                434B
        16FA    0D0A
        16FC    44455620        1334  MSG4    DC    C'DEV *** FALSE SYNC **',X'0D0A'                    MBF13360
                2A2A2A20
                46414C53
                45205359
                4E43202A
                2A20
        1712    0D0A
                0000 16FC       1335  OUSYS   EQU   MSG4                                                MBF13370
        1714    44454620        1336  MSG5    DC    C'DEF SEC FLAGGED ********  *** ** **',X'0D0A'      MBF13380
                53454320
                464C4147
                47454420
                2A2A2A2A
                2A2A2A2A
                20202A2A
                2A202A2A
                202A2A20
        1738    0D0A
        173A    44454620        1337  MSG6    DC    C'DEF TRK FLAGGED ********  *** **',X'0D0A'      MBF13390
                54524B20
                464C4147
                47454420
                2A2A2A2A
                2A2A2A2A
                20202A2A
                2A202A2A
        175A    0D0A
        175C    464C4147        1338  MSG7    DC    C'FLAG REJECTED   ********  *** ** ** <---x',x'0D0A'  MBF13400
                2052454A
                45435445
                44202020
                2A2A2A2A
                2A2A2A2A
                20202A2A
                2A202A2A
                202A2A20
                3C2D2D2D
                5820
        1786    0D0A
        1788    434F4E54        1339  MSG8    DC    C'CONTROLLER FORMAT SWITCH OFF',X'0D0A'             MBF13410
                524F4C4C
                45522046
                4F524D41
                54205357
                49544348
                204F4646
        17A4    0D0A
        17A6    534F4654        1340  MSG9    DC    C'SOFT ERROR      ********  *** ** **',X'0D0A'      MBF13420
                20455252
                4F522020
                20202020
                2A2A2A2A
                2A2A2A2A
```

```
                20202A2A
                2A202A2A
                202A2A20
      17CA      0D0A
      17CC      494E5641          1341  MSG10    DC      C'INVALID        OPTION',X'0D0A'                    MBF13430
                4C494420
                20202020
                2020204F
                5054494F
                4E20
      17E2      0D0A
      17E4      52454455          1342  MSG11    DC      C'REDUNDANT SEEK ERROR',X'0D0A'                    MBF13440
                4E44414E
                54205345
                454B2045
                52524F52
      17F8      0D0A
      17FA      44524956          1343  MSG12    DC      C'DRIVE * SELECTED',X'0D0A'                        MBF13450
                45202A20
                53454C45
                43544544
      180A      0D0A
      180C      44524956          1344  MSG13    DC      C'DRIVE *: WRITE PROTECTED',X'0D0A'                MBF13460
                45202A3A
                20575249
                54452050
                524F5445
                43544544
      1824      0D0A
      1826      44524956          1345  MSG15    DC      C'DRIVE *: OFF LINE',X'0D0A'                       MBF13470
                45202A3A
                204F4646
                204C494E
                4520
      1838      0D0A
      183A      44524956          1346  MSG16    DC      C'DRIVE *: UNRECOVERABLE ERROR - STATUS **',X'0D0A' MBF13480
                45202A3A
                20554E52
                45434F56
                45524142
                4C452045
                52524F52
                20202053
                54415455
                53202A2A
      1862      0D0A
                                  1347  *                                                                   MBF13490
      1864      C850 1594       1348  ERROR1   LDAI    R5,LOCYL          INVALID LOCYL OPTION             MBF13500
      1868      4300 18F8       1349            B       SETMSG                                             MBF13510
      186C      C850 15A0       1350  ERROR2   LDAI    R5,HICYL          INVALID HICYL OPTION             MBF13520
      1870      4300 18F8       1351            B       SETMSG                                             MBF13530
      1874      C850 16C6       1352  ERROR3   LDAI    R5,MSG2           'WHICH DRIVE ?'                  MBF13540
      1878      4050 1670       1353            STH     R5,FATAL                                           MBF13550
      187C      4300 1910       1354            B       PRINTIT                                            MBF13560
      1880      081B            1355  ERROR4   LDAR    R1,TRACK                                           MBF13570
      1882      2403            1356            LIS     R0,3                                               MBF13580
```

```
1884 4000 1670  1357          STA   R0,FATAL                                  MBF13590
1888 C820 16ED  1358          LDAI  R2,MSG3+25                                MBF13600
188C 41F0 0FBE  1359          BAL   R15,HEXASC                                MBF13610
1890 C850 16D4  1360          LDAI  R5,MSG3          CE PACK CYL ADRS VIOLATION MBF13620
1894 4300 1910  1361          B     PRINTIT                                   MBF13630
1898 C850 17E4  1362 ERROR5   LDAI  R5,MSG11         REDUNDANT SEEK ERROR      MBF13640
189C 4300 1910  1363          B     PRINTIT                                   MBF13650
18A0 C850 1558  1364 ERROR6   LDAI  R5,DRIVE         INVALID DRIVE OPTION      MBF13660
18A4 4300 18F8  1365          B     SETMSG                                    MBF13670
18A8 C850 180C  1366 ERROR7   LDAI  R5,MSG13         DRIV_ WRITE-PROTECTED     MBF13680
18AC 4300 18E0  1367          B     SELECT                                    MBF13690
18B0 C850 1826  1368 ERROR8   LDAI  R5,MSG15         DRIVE OFFLINE             MBF13700
18B4 4300 18E0  1369          B     SELECT                                    MBF13710
18B8 C850 157C  1370 ERROR10  LDAI  R5,PACTYP        INVALID PACTYP OPTION     MBF13720
18BC 4300 18F8  1371          B     SETMSG                                    MBF13730
18C0 C850 1788  1372 ERROR11  LDAI  R5,MSG8          FORMAT SWITCH OFF         MBF13740
18C4 4050 1670  1373          STA   R5,FATAL                                  MBF13750
18C8 4300 1910  1374          B     PRINTIT                                   MBF13760
18CC 081A       1375 ERROR13  LDAR  R1,STAT                                   MBF13770
18CE 2402       1376          LIS   R0,2                                      MBF13780
18D0 C820 1860  1377          LDAI  R2,MSG16+38                               MBF13790
18D4 41F0 0FBE  1378          BAL   R15,HEXASC                                MBF13800
18D8 C850 183A  1379          LDAI  R5,MSG16         UNRECOVERABLE DRIVE ERROR MBF13810
18DC 4300 1910  1380          B     PRINTIT                                   MBF13820
                1381 *                                                        MBF13830
18E0 4810 14D6  1382 SELECT   LH    R1,BTESTNO       CONVT DRIVE NUMBER TO PRINT MBF13840
18E4 D311 14E6  1383          LB    R1,HEXTAB(R1)                             MBF13850
18E8 D210 1812  1384          STB   R1,MSG13+6                                MBF13860
18EC D210 182C  1385          STB   R1,MSG15+6                                MBF13870
18F0 D210 1840  1386          STB   R1,MSG16+6                                MBF13880
18F4 4300 1910  1387          B     PRINTIT                                   MBF13890
                1388 *                                                        MBF13900
18F8 2416       1389 SETMSG   LIS   R1,6                                      MBF13910
18FA 4010 1670  1390          STA   R1,FATAL                                  MBF13920
18FE D305 0005  1391 SETMSG1  LB    R0,5(R5)                                  MBF13930
1902 D201 17D3  1392          STB   R0,MSG10+7(R1)                            MBF13940
1906 2751       1393          SIS   R5,1                                      MBF13950
1908 2711       1394          SIS   R1,1                                      MBF13960
190A 2026       1395          BPS   SETMSG1                                   MBF13970
190C C850 17CC  1396          LDAI  R5,MSG10                                  MBF13980
                1397 *                                                        MBF13990
1910 41F0 11F4  1398 PRINTIT  BAL   R15,SETKB                                 MBF14000
1914 41F0 101E  1399          BAL   R15,PRINT                                 MBF14010
1918 4800 1670  1400          LDA   R0,FATAL         ABORT CURRENT SEQUENCE ?  MBF14020
191C 4330 0E14  1401          BZ    TSTEND           BRANCH IF NO.             MBF14030
1920 4300 0AE6  1402          B     OPTIN1           TO EXEC.                  MBF14040
                1403 *                                                        MBF14050


                0000 1924  1405 INIT    EQU   *                               MBF14070
1924 D320 1583  1406          LB    R2,PACTYP+7      LOAD PHYSICAL IDENTIFIER  MBF14080
1928 2410       1407          LIS   R1,0                                      MBF14090
192A 4010 1670  1408          STA   R1,FATAL                                  MBF14100
192E D421 164C  1409 INI.0    CLB   R2,TYPTAB(R1)                             MBF14110
1932 2337       1410          BES   INI.1            BRANCH: MATCH.           MBF14120
```

```
1934  2611           1411          AIS   R1,1                                MBF14130
1936  C510 0001      1412          CLHI  R1,TABSIZ          SEARCH DONE?       MBF14140
193A  4380 18B8      1413          BNL   ERROR10            INVALID PACTYP OPTION MBF14150
193E  2208           1414          BS    INI.0                                MBF14160
                     1415  *                                                  MBF14170
1940  D301 1636      1416  INI.1   LB    R0,SYNCTAB(R1)     HEADER SYNC BYTE  MBF14180
1944  D200 168A      1417          STB   R0,SYNC                              MBF14190
1948  9111           1418          SLLS  R1,1               (HALFWORD INDEX)  MBF14200
194A  4801 1618      1419          LH    R0,SECTAB(R1)      SECTORS/TRACK     MBF14210
194E  4000 1678      1420          STH   R0,MAXSEC                            MBF14220
1952  4801 161E      1421          LH    R0,HEDTAB(R1)      HEADS/CYLINDER    MBF14230
1956  4000 167A      1422          STH   R0,MAXHEAD                           MBF14240
195A  4801 1624      1423          LH    R0,CYLTAB(R1)      CYLINDERS/PACK    MBF14250
195E  4000 167C      1424          STH   R0,MAXCYL                            MBF14260
1962  4801 162A      1425          LH    R0,INDXTAB(R1)     PATTERNS/FORMAT   MBF14270
1966  4000 167E      1426          STH   R0,MAXDEX                            MBF14280
196A  4801 1630      1427          LH    R0,INCRTAB(R1)     SECTOR ADVANCE INCREMENT MBF14290
196E  4000 1682      1428  INI.1A  STH   R0,INCRMT                            MBF14300
1972  4801 163A      1429          LH    R0,GAPTAB(R1)      HEADER GAP SIZE   MBF14310
1976  4000 1684      1430          STH   R0,GAPSIZE                           MBF14320
197A  4801 1640      1431          LH    R0,LRECLTAB(R1)    LOGICAL BYTES/SECTOR MBF14330
197E  4000 1686      1432          STH   R0,LRECL                             MBF14340
1982  4801 1646      1433          LH    R0,PRECLTAB(R1)    PHYSICAL BYTES/SECTOR MBF14350
1986  4000 1688      1434          STH   R0,PRECL                             MBF14360
                     1435  *                                                  MBF14370
198A  2400           1436          LIS   R0,0                                 MBF14380
198C  4000 1696      1437          STH   R0,DSTSIZ                            MBF14390
1990  4800 1678      1438          LH    R0,MAXSEC                            MBF14400
1994  4810 167A      1439          LH    R1,MAXHEAD                           MBF14410
1998  6100 1696      1440  INI.2   AHM   R0,DSTSIZ          COMPUTE SECTORS/CYLINDER MBF14420
199C  2711           1441          SIS   R1,1                                 MBF14430
199E  2023           1442          BPS   INI.2                                MBF14440
                     1443  *                                                  MBF14450
19A0  2405           1444          LIS   R0,5                                 MBF14460
19A2  4000 1680      1445          STH   R0,SKCNT           MAX SEEK RETRY COUNT MBF14470
19A6  4800 15B2      1446          LH    R0,FMTWP+6                           MBF14480
19AA  9106           1447          SLLS  R0,6                                 MBF14490
19AC  4000 169C      1448          STH   R0,PROTECT                           MBF14500
                     1449  *                                                  MBF14510
19B0  4810 1688      1450          LH    R1,PRECL                             MBF14520
19B4  4800 1662      1451          LH    R0,RSA+2                             MBF14530
19B8  CA01 FFFF      1452          AHI   R0,-1(R1)                            MBF14540
19BC  4000 1666      1453          STH   R0,RFA+2                             MBF14550
19C0  4800 165A      1454          LH    R0,WSA+2                             MBF14560
19C4  CA01 FFFF      1455          AHI   R0,-1(R1)                            MBF14570
19C8  4000 165E      1456          STH   R0,WFA+2                             MBF14580
                     1457  *                                                  MBF14590
19CC  4860 1576      1458          LH    R6,SELCH+6                           MBF14600
19D0  DE60 160E      1459          OC    R6,STOP            STOP SELCH        MBF14610
19D4  4060 15EA      1460          STH   R6,DEVSADR                           MBF14620
19D8  4860 156A      1461          LH    R6,DISCON+6                          MBF14630
19DC  4060 15EC      1462          STH   R6,DEVSADR+2                         MBF14640
19E0  2470           1463          LIS   R7,0                                 MBF14650
19E2  2661           1464  INI.3   AIS   R6,1                                 MBF14660
19E4  4067 15EE      1465          STH   R6,DEVSADR+4(R7)                     MBF14670
19E8  2672           1466          AIS   R7,2                                 MBF14680
```

```
19EA C570 0008 1467          CLHI  R7,8                                    MBF14690
19EE 2086      1468          BLS   INI.3                                   MBF14700
               1469  *                                                     MBF14710
19F0 4800 155E 1470          LH    R0,DRIVE+6                              MBF14720
19F4 4330 18A0 1471          BZ    ERROR6          INVALID DRIVE OPTION    MBF14730
19F8 4810 1554 1472          LDA   R1,TESTS                                MBF14740
19FC C510 1C62 1473          CLAI  R1,FMT.MOD                              MBF14750
1A00 4330 1AB6 1474          BE    INI.5           NOT USED BY FMT.MOD     MBF14760
1A04 9001      1475  INI.4   SRLS  R0,1                                    MBF14770
1A06 2281      1476          BNCS  INI.4                                   MBF14780
1A08 4230 1874 1477          BNZ   ERROR3          'WHICH DRIVE'           MBF14790
               1478  *                                                     MBF14800
               1479  * CHECK 'FLAG' INPUT PARAMETERS.                      MBF14810
               1480  *                                                     MBF14820
1A0C C510 1F7E 1481          CLAI  R1,FLG.MOD                              MBF14830
1A10 4230 1AB6 1482          BNE   INI.5           USED BY FLG.MOD         MBF14840
1A14 24A5      1483          LIS   R10,5           SET CURSOR TO OPERAND START MBF14850
1A16 41E0 1AF0 1484          BAL   R14,SCAN        GET NUMERIC STRING      MBF14860
1A1A C540 000D 1485          CLHI  R4,X'0D'        CARRIAGE RETURN ?       MBF14870
1A1E 4230 1A40 1486          BNE   SC.5                                    MBF14880
               1487  *                                                     MBF14890
               1488  * IF CARRIAGE RETURN, STORE LBN.                      MBF14900
1A22 C520 0009 1489          CLHI  R2,9                                    MBF14910
1A26 038C      1490          BNLR  R12             INPUT ERROR - 8 CHARS ALLOWED. MBF14920
1A28 48F0 14A0 1491          LH    R15,MOD32                               MBF14930
1A2C 2332      1492          BZS   SC.4                                    MBF14940
1A2E 3401      1493          DCX   3401            *EXHR R0,R1             MBF14950
1A30 4000 1674 1494  SC.4    STH   R0,LBN                                  MBF14960
1A34 4010 1676 1495          STH   R1,LBN+2        STORE LOGICAL BLOCK NUMBER. MBF14970
1A38 41E0 1B9C 1496          BAL   R14,DECODE                              MBF14980
1A3C 4300 1A94 1497          B     TSTPARM                                 MBF14990
               1498  *                                                     MBF15000
               1499  * IF SPACE WAS ENCOUNTERED, STORE CYLINDER ADDRESS.    MBF15010
1A40 C540 0020 1500  SC.5    CLHI  R4,X'20'        SPACE ?                 MBF15020
1A44 023C      1501          BNER  R12             BRANCH: INPUT ERROR     MBF15030
1A46 C520 0004 1502          CLHI  R2,4            CHECK CHAR COUNT        MBF15040
1A4A 038C      1503          BNLR  R12             3 CHARS MAX ALLOWED.    MBF15050
1A4C 4010 1690 1504          STH   R1,CYLNUM       SAVE CYLINDER ADRS      MBF15060
               1505  *                                                     MBF15070
               1506  * PROCESS HEAD ADDRESS                                MBF15080
1A50 26A1      1507          AIS   R10,1           POSITION CURSOR         MBF15090
1A52 41E0 1AF0 1508          BAL   R14,SCAN        GET HEAD ADRS NUMERIC STRING MBF15100
1A56 C520 0003 1509          CLHI  R2,3                                    MBF15110
1A5A 038C      1510          BNLR  R12             INPUT ERROR             MBF15120
1A5C 4010 1692 1511          STH   R1,HEADNUM                              MBF15130
               1512  *                                                     MBF15140
               1513  * PROCESS SECTOR ADDRESS                              MBF15150
1A60 2410      1514          LIS   R1,0                                    MBF15160
1A62 4800 158E 1515          LH    R0,FMTSEC+6                             MBF15170
1A66 233A      1516          BZS   SC.6                                    MBF15180
1A68 C540 0020 1517          CLHI  R4,X'20'        SPACE ?                 MBF15190
1A6C 023C      1518          BNER  R12             INPUT ERROR             MBF15200
               1519  *                                                     MBF15210
1A6E 26A1      1520          AIS   R10,1           POSITION CURSOR         MBF15220
1A70 41E0 1AF0 1521          BAL   R14,SCAN                                MBF15230
1A74 C520 0003 1522          CLHI  R2,3                                    MBF15240
```

```
1A78  038C           1523          BNLR   R12                                          MBF15250
1A7A  4010 1694      1524  SC.8    STH    R1,SECTNUM                                   MBF15260
1A7E  C540 000D      1525          CLHI   R4,X'0D'                                    MBF15270
1A82  023C           1526          BNER   R12                                          MBF15280
1A84  4880 1694      1527          LH     SECT,SECTNUM                                 MBF15290
1A88  4890 1692      1528          LH     HEAD,HEADNUM                                 MBF15300
1A8C  48B0 1690      1529          LH     TRACK,CYLNUM                                 MBF15310
1A90  41E0 1B58      1530          BAL    R14,ENCODE      CREATE LBN                   MBF15320
                     1531  *                                                           MBF15330
1A94  48B0 1690      1532  TSTPARM LH     TRACK,CYLNUM                                 MBF15340
1A98  45B0 167C      1533          CLH    TRACK,MAXCYL                                 MBF15350
1A9C  038C           1534          BNLR   R12             CYLINDER ADDRESS ERROR       MBF15360
1A9E  4890 1692      1535          LH     HEAD,HEADNUM                                 MBF15370
1AA2  4590 167A      1536          CLH    HEAD,MAXHEAD                                 MBF15380
1AA6  038C           1537          BNLR   R12             INPUT ERROR                  MBF15390
1AA8  4880 1694      1538          LH     SECT,SECTNUM                                 MBF15400
1AAC  4580 1678      1539          CLH    SECT,MAXSEC                                  MBF15410
1AB0  038C           1540          BNLR   R12             INPUT ERROR                  MBF15420
1AB2  4300 1AEC      1541          B      INI.6           NOT USED BY FLG.MOD          MBF15430
                     1542  *                                                           MBF15440
1AB6  4800 15A6      1543  INI.5   LH     R0,HICYL+6                                   MBF15450
1ABA  4210 186C      1544          BM     ERROR2          INVALID HICYL OPTION         MBF15460
1ABE  4500 167C      1545          CLH    R0,MAXCYL                                    MBF15470
1AC2  4380 186C      1546          BNL    ERROR2          INVALID HICYL OPTION         MBF15480
1AC6  0880           1547          LDAR   TRACK,R0                                     MBF15490
1AC8  C8E0 1880      1548          LDAI   R14,ERROR4                                   MBF15500
1ACC  41F0 1C26      1549          BAL    R15,ILLADD                                   MBF15510
1AD0  4810 159A      1550          LH     R1,LOCYL+6                                   MBF15520
1AD4  4210 1864      1551          BM     ERROR1          INVALID LOCYL OPTION         MBF15530
1AD8  4510 167C      1552          CLH    R1,MAXCYL                                    MBF15540
1ADC  4380 1864      1553          BNL    ERROR1          INVALID LOCYL OPTION         MBF15550
1AE0  05B1           1554          CLAR   TRACK,R1                                     MBF15560
1AE2  4280 186C      1555          BL     ERROR2          INVALID HICYL OPTION         MBF15570
1AE6  08B1           1556          LDAR   TRACK,R1                                     MBF15580
1AE8  41F0 1C26      1557          BAL    R15,ILLADD                                   MBF15590
                     1558  *                                                           MBF15600
1AEC  4300 0D40      1559  INI.6   B      INITRET         SELECT MODULE.               MBF15610


                     1561  * SUBROUTINE SCAN CHECKS INPUT PARAMETERS FOR THE 'FLAG' COMMAND.  MBF15630
                     1562  * REGISTERS DESTROYED: R0,R1,R2,R4,R10,R13,R15                     MBF15640
                     1563  * BAL    R14,SCAN                                                  MBF15650
                     1564  *                                                                  MBF15660
1AF0  2400           1565  SCAN    LIS    R0,0                                         MBF15670
1AF2  2410           1566          LIS    R1,0            ACCUMULATOR                  MBF15680
1AF4  2420           1567          LIS    R2,0            DIGIT COUNTER                MBF15690
1AF6  24FF           1568  SCAN1   LIS    R15,15                                       MBF15700
1AF8  D34A 22EA      1569          LB     R4,OPTBUF(R10)                               MBF15710
1AFC  D44F 14E6      1570  SC.1    CLB    R4,HEXTAB(R15)  MATCH DIGIT (?)              MBF15720
1B00  2334           1571          BES    SC.2                                         MBF15730
1B02  27F1           1572          SIS    R15,1                                        MBF15740
1B04  021E           1573          BMR    R14             NO MATCH                     MBF15750
1B06  2205           1574          BS     SC.1            CONTINUE                     MBF15760
                     1575  *                                                           MBF15770
1B08  48D0 14A0      1576  SC.2    LH     R13,MOD32                                    MBF15780
```

```
1B0C  2332           1577          BZS   SC.3              BRANCH: SERIES 16 PROC.          MBF15790
1B0E  1114           1578          DCX   1114             *SLLS R1,4 (32 BIT SHIFT)        MBF15800
1B10  ED00 0004      1579  SC.3    SLL   R0,4              32-BIT SHIFT                     MBF15810
1B14  061F           1580          OAR   R1,R15            ACCUMULATE                       MBF15820
1B16  26A1           1581          AIS   R10,1             BUMP POINTER                     MBF15830
1B18  2621           1582          AIS   R2,1              AND COUNTER                      MBF15840
1B1A  4300 1AF6      1583          B     SCAN1                                              MBF15850


                     1585  * SUBROUTINE FMSUDF SETS UP CORRECT GAP2, SYNC2, AND NORMAL-MODE MBF15870
                     1586  * LRC FIELDS, AND SETS DATA FIELD TO ZERO FOR FORMAT-MODE TRANSFER.MBF15880
                     1587  * REGISTERS DESTROYED: R1,R2,R3,R4,R13,R14                        MBF15890
                     1588  *                                                                MBF15900
1B1E  2411           1589  FMSUDF  LIS   R1,1              SET SECTOR COUNT                 MBF15910
1B20  240D           1590  FMSUDFA LIS   R13,0             GAP BYTE                         MBF15920
1B22  D3E0 168A      1591          LB    R14,SYNC          SYNC BYTE                        MBF15930
1B26  2420           1592          LIS   R2,0                                               MBF15940
1B28  2542           1593          LCS   R4,2                                               MBF15950
1B2A  2431           1594  FMSU0   LIS   R3,1                                               MBF15960
1B2C  4A40 1684      1595          AH    R4,GAPSIZE                                         MBF15970
1B30  2642           1596          AIS   R4,2                                               MBF15980
1B32  D2D2 294B      1597  FMSU1   STB   R13,WTF+3(R2)                                      MBF15990
1B36  C120 1B32      1598          BXLE  R2,FMSU1                                           MBF16000
1B3A  D2E4 294B      1599          STB   R14,WTF+3(R4)                                      MBF16010
1B3E  2623           1600          AIS   R2,3                                               MBF16020
1B40  2432           1601          LIS   R3,2                                               MBF16030
1B42  4840 1686      1602          LH    R4,LRECL                                           MBF16040
1B46  0A42           1603          AAR   R4,R2                                              MBF16050
1B48  40D2 2948      1604  FMSU2   STH   R13,WTF(R2)                                        MBF16060
1B4C  C120 1B48      1605          BXLE  R2,FMSU2                                           MBF16070
1B50  2711           1606          SIS   R1,1                                               MBF16080
1B52  021F           1607          BMR   R15               RETURN                           MBF16090
1B54  4300 1B2A      1608          B     FMSU0                                              MBF16100


                     1610  * SUBROUTINE ENCODE CONVERTS CYLINDER, HEAD, & SECTOR ADRESS TO  MBF16120
                     1611  * A POINTER INTO THE LINEAR SECTOR ARRAY                         MBF16130
                     1612  * REGISTERS DESTROYED: NONE.                                     MBF16140
                     1613  *                                                                MBF16150
     0000 1B58       1614  ENCODE  EQU   *                 CONVERT CYL, HEAD, SECT TO LBN   MBF16160
1B58  D000 2348      1615          STM   R0,RSAVE                                           MBF16170
1B5C  2421           1616          LIS   R2,1              .                                MBF16180
1B5E  2400           1617          LIS   R0,0                                               MBF16190
1B60  4000 1674      1618          STH   R0,LBN                                             MBF16200
1B64  4080 1676      1619          STH   SECT,LBN+2        SECTOR NUMBER                    MBF16210
1B68  4810 1678      1620          LH    R1,MAXSEC         TRACK SECTOR DELTA               MBF16220
1B6C  0809           1621          LDAR  R0,HEAD           .                                MBF16230
1B6E  4320 1B80      1622          BNP   ENC.3             .                                MBF16240
1B72  6110 1676      1623  ENC.1   AHM   R1,LBN+2          .                                MBF16250
1B76  2383           1624          BNCS  ENC.2             .                                MBF16260
1B78  6120 1674      1625          AHM   R2,LBN            .                                MBF16270
1B7C  2701           1626  ENC.2   SIS   R0,1              .                                MBF16280
1B7E  2026           1627          BPS   ENC.1             .                                MBF16290
1B80  4810 1696      1628  ENC.3   LH    R1,DSISIZ         CYLINDER SECTOR DELTA            MBF16300
```

```
1B84 080B          1629          LDAR  R0,TRACK          .                    MBF16310
1B86 2328          1630          BNPS  ENC.6            .                    MBF16320
1B88 6110 1676     1631  ENC.4   AHM   R1,LBN+2         .                    MBF16330
1B8C 2383          1632          BNCS  ENC.5            .                    MBF16340
1B8E 6120 1674     1633          AHM   R2,LBN           .                    MBF16350
1B92 2701          1634  ENC.5   SIS   R0,1             .                    MBF16360
1B94 2026          1635          BPS   ENC.4            .                    MBF16370
1B96 D100 2348     1636  ENC.6   LM    R0,RSAVE                              MBF16380
1B9A 030E          1637          BR    R14              RETURN.              MBF16390


                   1639  * SUBROUTINE DECODE CONVERTS THE LINEAR SECTOR POINTER INTO    MBF16410
                   1640  * THE CORRESPONDING CYLINDER, HEAD, AND SECTOR ADDRESSES.      MBF16420
                   1641  * REGISTERS DESTROYED: R0,R1,R2                                MBF16430
                   1642  *                                                              MBF16440
0000 1B9C          1643  DECODE  EQU   *                GET CYL, HEAD, SECTOR FROM LBN  MBF16450
1B9C 2490          1644          LIS   HEAD,0                                          MBF16460
1B9E 2480          1645          LIS   SECT,0                                          MBF16470
1BA0 24B0          1646          LIS   TRACK,0                                         MBF16480
1BA2 4800 14A0     1647          LH    R0,MOD32                                        MBF16490
1BA6 2336          1648          BZS   DEC.0                                           MBF16500
1BA8 7300          1649          DC    X'7300',Z(LBN)   *LHL R0,LBN                  MBF16510
1BAA 1674
1BAC 7310          1650          DC    X'7310',Z(LBN+2) *LHL R1,LBN+2                MBF16520
1BAE 1676
1BB0 2305          1651          BS    DEC.1                                           MBF16530
1BB2 4800 1674     1652  DEC.0   LH    R0,LBN                                          MBF16540
1BB6 4810 1676     1653          LH    R1,LBN+2                                        MBF16550
1BBA 4B10 1696     1654  DEC.1   SH    R1,DSTSIZ        ADVANCE CYLINDER               MBF16560
1BBE 2386          1655          BNCS  DEC.2                                           MBF16570
1BC0 2701          1656          SIS   R0,1                                            MBF16580
1BC2 2384          1657          BNCS  DEC.2                                           MBF16590
1BC4 4A10 1696     1658          AH    R1,DSTSIZ        CORRECT EXCESS SUBTRACTION     MBF16600
1BC8 2309          1659          BS    DEC.3                                           MBF16610
1BCA 26B1          1660  DEC.2   AIS   TRACK,1                                        MBF16620
1BCC 4820 14A0     1661          LH    R2,MOD32                                        MBF16630
1BD0 2238          1662          BZS   DEC.1                                           MBF16640
1BD2 F410          1663          DCX   F410,0000,FFFF   *NI R1,Y'0000FFFF'            MBF16650
1BD4 0000
1BD6 FFFF
1BD8 220F          1664          BS    DEC.1                                           MBF16660
1BDA 4B10 1678     1665  DEC.3   SH    R1,MAXSEC        ADVANCE HEAD                   MBF16670
1BDE 2384          1666          BNCS  DEC.4                                           MBF16680
1BE0 4A10 1678     1667          AH    R1,MAXSEC        CORRECT EXCESS SUBTRACTION     MBF16690
1BE4 2303          1668          BS    DEC.5                                           MBF16700
1BE6 2691          1669  DEC.4   AIS   HEAD,1                                         MBF16710
1BE8 2207          1670          BS    DEC.3                                           MBF16720
1BEA 0881          1671  DEC.5   LDAR  SECT,R1          RESIDUE = SECTOR ADRS         MBF16730
1BEC 40B0 1690     1672          STH   TRACK,CYLNUM                                    MBF16740
1BF0 4090 1692     1673          STH   HEAD,HEADNUM                                    MBF16750
1BF4 4080 1694     1674          STH   SECT,SECTNUM                                    MBF16760
1BF8 030E          1675          BR    R14              RETURN TO CALLER              MBF16770
```

```
                                1677  * SUBROUTINE RECODE CONVERTS CURRENT CYLINDER ADDRESS AND DSTBL          MBF16790
                                1678  * INDEX TO THE CORRESPONDING LINEAR SECTOR POINTER.                     MBF16800
                                1679  * REGISTERS DESTROYED: HEAD,SECT                                       MBF16810
          0000 1BFA             1680  RECODE   EQU    *                COMPUTE LBN, SECT, HEAD FROM DSTBL    MBF16820
1BFA      2490                  1681           LIS    HEAD,0                                                 MBF16830
1BFC      0881                  1682           LDAR   SECT,R1          COPY DSTBL INDEX                      MBF16840
1BFE      4580 1678             1683  REC.1    CLH    SECT,MAXSEC                                            MBF16850
1C02      4280 1B58             1684           BL     ENCODE           COMPUTE LBN: RETURN ON R14            MBF16860
1C06      4B80 1678             1685           SH     SECT,MAXSEC                                            MBF16870
1C0A      2691                  1686           AIS    HEAD,1                                                 MBF16880
1C0C      2207                  1687           BS     REC.1                                                  MBF16890


                                1689  * SUBROUTINE DISPLAY WRITES DRIVE, CYLINDER, HEAD, AND SECTOR          MBF16910
                                1690  * ADDRESSES TO THE PROCESSOR DISPLAY PANEL.                            MBF16920
                                1691  * REGISTERS DESTROYED: R0,R1                                           MBF16930
                                1692  *                                                                      MBF16940
1C0E      2401                  1693  DISPLAY  LIS    R0,1                                                   MBF16950
1C10      DE00 14B5             1694           OC     R0,INCR          DISPLAY TO INCREMENTAL MODE           MBF16960
1C14      9A08                  1695           WDR    R0,SECT          SECTOR                                MBF16970
1C16      9A09                  1696           WDR    R0,HEAD          HEAD                                  MBF16980
1C18      941B                  1697           EXBR   R1,TRACK         CYLINDER                              MBF16990
1C1A      9801                  1698           WHR    R0,R1                                                  MBF17000
1C1C      DA00 14D7             1699           WD     R0,BTESTNO+1                                           MBF17010
1C20      DE00 14B4             1700           OC     R0,NORM                                                MBF17020
1C24      030E                  1701           BR     R14              RETURN                                MBF17030


                                1703  * CHECK FOR INVALID CYLINDERS ON CE DISC PACK                          MBF17050
                                1704  * REGISTERS DESTROYED: R0                                              MBF17060
                                1705  *                                                                      MBF17070
1C26      C800 00CE             1706  ILLADD   LHI    R0,X'CE'         CE DISC PACK ?                        MBF17080
1C2A      D400 1582             1707           CLB    R0,PACTYP+6                                            MBF17090
1C2E      023F                  1708           BNER   R15              RETURN                                MBF17100
1C30      C5B0 0046             1709           CLHI   TRACK,70         < 70                                  MBF17110
1C34      028F                  1710           BLR    R15              OK                                    MBF17120
1C36      C5B0 004C             1711           CLHI   TRACK,76         70-75                                 MBF17130
1C3A      028E                  1712           BLR    R14              REJECT                                MBF17140
1C3C      C5B0 0073             1713           CLHI   TRACK,115        76-114                                MBF17150
1C40      028F                  1714           BLR    R15              OK                                    MBF17160
1C42      C5B0 0079             1715           CLHI   TRACK,121        115-120                               MBF17170
1C46      028E                  1716           BLR    R14              REJECT                                MBF17180
1C48      C5B0 008C             1717           CLHI   TRACK,140        121-139                               MBF17190
1C4C      028F                  1718           BLR    R15              OK                                    MBF17200
1C4E      C5B0 0097             1719           CLHI   TRACK,151        140-150                               MBF17210
1C52      028E                  1720           BLR    R14              REJECT                                MBF17220
1C54      C5B0 00E6             1721           CLHI   TRACK,230        151-229                               MBF17230
1C58      028F                  1722           BLR    R15              OK                                    MBF17240
1C5A      C5B0 00F1             1723           CLHI   TRACK,241        230-240                               MBF17250
1C5E      028E                  1724           BLR    R14              REJECT                                MBF17260
1C60      030F                  1725           BR     R15              >240                                  MBF17270
```

```
1727  * ************************************************** MBF17290
1728  *                                                    MBF17300
1729  *              F O R M A T   M O D U L E             MBF17310
1730  *                                                    MBF17320
1731  * PURPOSE OF MODULE:                                 MBF17330
1732  * FMT.MOD EVALUATES THE SURFACE OF THE DISC PACK, ESTABLISHES MBF17340
1733  * PROPER FORMAT, AND FLAGS FAULTY SECTORS AS DEFECTIVE, BY SETTING MBF17350
1734  * THE DEF SEC BIT IN THE HEADER OF EACH DEFECTIVE SECTOR. MBF17360
1735  *                                                    MBF17370
1736  * ASSUMPTIONS:                                       MBF17380
1737  * EACH DISC DRIVE TO BE SELECTED MUST BE ON-LINE, AND NOT WRITE- MBF17390
1738  * PROTECTED. THE CONTROLLER FORMAT SWITCH MUST BE IN THE FORMAT MBF17400
1739  * POSITION.                                          MBF17410
1740  *                                                    MBF17420
1741  * DESIGN SPECIFICATIONS:                             MBF17430
1742  * A SEEK IS BEGUN TO THE SPECIFIED LOCYL; DURING THE SEEK, A MBF17440
1743  * TABLE TO CONTAIN ENTRIES FOR FAULTY SECTORS IS ESTABLISHED. MBF17450
1744  * WHEN THE SEEK IS COMPLETE, A WORST-CASE PATTERN IS WRITTEN MBF17460
1745  * TO EVERY SECTOR IN THE CYLINDER, INCLUDING HEADER, SYNC, AND MBF17470
1746  * GAP FIELDS.                                        MBF17480
1747  *                                                    MBF17490
1748  * EACH SECTOR IS THEN 'READ-CHECKED' IN FORMAT MODE,FOUR TIMES MBF17500
1749  * NO LRC ERROR IS EXPECTED. A FIFTH READ IS DONE, USING THE MBF17510
1750  * SELCH, AND THE DATA READ IS TESTED. ANY ERROR CAUSES A 'SOFT' MBF17520
1751  * ERROR TALLY TO BE INCREMENTED FOR THE SECTOR, IN 'DSTBL'. MBF17530
1752  *                                                    MBF17540
1753  * AFTER THIS SEQUENCE HAS BEEN REPEATED FOR EACH WORST-CASE MBF17550
1754  * PATTERN, PROPER FORMAT IS WRITTEN TO THE ENTIRE CYLINDER, AND MBF17560
1755  * EACH SECTOR IS NORMAL-MODE READ-CHECKED. ANY ERROR CAUSES A MBF17570
1756  * FLAG TO BE SET IN DSTBL FOR THE SECTOR, INDICATING 'HARD ERROR'. MBF17580
1757  *                                                    MBF17590
1758  * FINALLY, DSTBL IS SCANNED FOR ANY SECTOR ERRORS. TWO 'SOFT' MBF17600
1759  * ERRORS, OR ANY 'HARD' ERROR, CAUSE A SECTOR TO BE FLAGGED MBF17610
1760  * DEFECTIVE, BY SETTING THE DEF SEC BIT IN THE SECTOR HEADER. MBF17620
1761  * THE SECTOR IS TESTED AFTER FLAGGING, FOR DEFECTIVE SECTOR MBF17630
1762  * STATUS FROM THE DISC SYSTEM CONTROLLER.            MBF17640
1763  *                                                    MBF17650
1764  * WHEN FLAGGING/TESTING IS COMPLETE, A SEEK IS MADE TO THE NEXT MBF17660
1765  * CYLINDER, IF REQUIRED. WHEN ALL SPECIFIED CYLINDERS HAVE BEEN MBF17670
1766  * PROCESSED, A READ-CHECK IS MADE OF SECTOR 0, HEAD 0 OF EACH MBF17680
1767  * CYLINDER BETWEEN LOCYL AND HICYL. ANY HEADER ERROR STATUS MBF17690
1768  * (IF NOT ACCOMPANIED BY DEF SEC STATUS) IS ASSUMED TO BE THE MBF17700
1769  * RESULT OF A REDUNDANT SEEK ERROR; AND A MESSAGE IS OUTPUT TO MBF17710
1770  * THAT EFFECT. IN THIS CASE, THE FORMAT OF THE DISC PACK IS NOT MBF17720
1771  * GUARANTEED.                                        MBF17730
1772  *                                                    MBF17740
1773  * WHEN FORMATTING IS COMPLETE FOR THE SELECTED DRIVE, THE DRIVE MBF17750
1774  * IS DESELECTED, AND THE PROCESS IS REPEATED FOR THE NEXT MBF17760
1775  * SPECIFIED DRIVE (IF ANY).                          MBF17770
1776  *                                                    MBF17780
1777  *                     N O T E                        MBF17790
1778  *                                                    MBF17800
1779  * IF A DRIVE ERROR OCCURS, UP TO FIVE ATTEMPTS ARE MADE TO RECOVER MBF17810
1780  * FROM THE ERROR. IF RECOVERY CANNOT BE MADE, THE DRIVE IS MBF17820
1781  * DESELECTED, AND THE NEXT SPECIFIED DRIVE (IF ANY) IS SELECTED. MBF17830
1782  *                                                    MBF17840
```

```
                                1783  * OPERATING PROCEDURES:                                                    MBF17850
                                1784  * MOUNT DISC PACKS ON REQUIRED DRIVES. ENTER THE CORRECT SELCH,            MBF17860
                                1785  * DISCON, DRIVE, LOCYL AND HICYL OPTIONS. ENTER 'FORMAT'. THE             MBF17870
                                1786  * FORMATTER PROCEEDS WITHOUT OPERATOR INTERVENTION.                        MBF17880
                                1787  *                                                                         MBF17890
                                1788  * OPTIONS:                                                                MBF17900
                                1789  * SELCH, DISCON, DRIVE, PACTYP, LOCYL, HICYL, FMTSEC, FMTWP               MBF17910
                                1790  *                                                                         MBF17920
                                1791  *                                                                         MBF17930
          0000 1C62             1792  FMT.MOD  EQU    *                    TESTS & FORMATS DISC SURFACE         MBF17940
1C62      4850 169A             1793           LH     FUT,FUTADRS                                               MBF17950
1C66      4860 156A             1794           LH     DCAD,DISCON+6                                             MBF17960
1C6A      4870 1576             1795           LH     SLAD,SELCH+6                                              MBF17970
1C6E      48B0 159A             1796           LH     TRACK,LOCYL+6                                             MBF17980


                                1798  * START SEEK TO SPECIFIED CYLINDER, DO TABLE SETUP WHILE SEEKING.         MBF18000
          0000 1C72             1799  FMT.1    EQU    *                    SEEK & PROCESS CYLINDER              MBF18010
1C72      40B0 1690             1800           STH    TRACK,CYLNUM                                              MBF18020
1C76      C8E0 1E98             1801           LDAI   R14,CYLADV1                                               MBF18030
1C7A      41F0 1C26             1802           BAL    R15,ILLADD           CHECK CE PACK CYL ADRS               MBF18040
1C7E      40F0 166C             1803           STA    R15,SKRTRY           SEEK ERROR RERUN ADRS                MBF18050
1C82      9D6A                  1804           SSR    DCAD,STAT                                                 MBF18060
1C84      2221                  1805           BFBS   IDLE,1                                                    MBF18070
1C86      DE50 160A             1806           OC     FUT,RSTATT           40MB RESET GATED ATTN                MBF18080
1C8A      9D6A                  1807           SSR    DCAD,STAT                                                 MBF18090
1C8C      2221                  1808           BFBS   IDLE,1                                                    MBF18100
1C8E      985B                  1809           WHR    FUT,TRACK            SEND CYLINDER ADRS                   MBF18110
1C90      DE50 1612             1810           OC     FUT,CYLCMD           SET CYLINDER                         MBF18120
1C94      9D6A                  1811           SSR    DCAD,STAT                                                 MBF18130
1C96      2221                  1812           BFBS   IDLE,1                                                    MBF18140
1C98      DE50 1613             1813           OC     FUT,SEEK             AND SEEK CYLINDER.                   MBF18150
                                1814  *                                                                         MBF18160
1C9C      2400                  1815           LIS    R0,0                                                      MBF18170
1C9E      2410                  1816           LIS    R1,0                                                      MBF18180
1CA0      2422                  1817           LIS    R2,2                                                      MBF18190
1CA2      4830 1696             1818           LH     R3,DSTSIZ            GET DSTBL SIZE                       MBF18200
1CA6      4001 2448             1819  FMT.1A   STH    R0,DSTBL(R1)         ZERO DSTBL.                          MBF18210
1CAA      C110 1CA6             1820           BXLE   R1,FMT.1A                                                 MBF18220
                                1821  *                                                                         MBF18230
1CAE      4830 167E             1822           LH     R3,MAXDEX                                                 MBF18240
1CB2      4030 168C             1823  PATLOOP  STH    R3,INDEX             INITIALIZE PATTERN INDEX             MBF18250
1CB6      4803 1650             1824           LH     R0,DATAB(R3)         LOAD 40MB W/C PATTERN                MBF18260
1CBA      0810                  1825           LDAR   R1,R0                                                     MBF18270
                                1826  *                                                                         MBF18280
1CBC      2420                  1827  SUD.0    LIS    R2,0                                                      MBF18290
1CBE      2434                  1828           LIS    R3,4                                                      MBF18300
1CC0      4840 1688             1829           LH     R4,PRECL             FORMAT-MODE RECORD SIZE              MBF18310
1CC4      4002 2948             1830  SUD.1    STH    R0,WTF(R2)           SET UP WORST-CASE PATTERN            MBF18320
1CC8      4012 294A             1831           STH    R1,WTF+2(R2)                                              MBF18330
1CCC      C120 1CC4             1832           BXLE   R2,SUD.1                                                  MBF18340
1CD0      4014 2A7C             1833           STH    R1,RDF(R4)           DUMMY DATA FOR FW COMPARES           MBF18350
                                1834  *                                                                         MBF18360
1CD4      4830 167E             1835           LH     R3,MAXDEX                                                 MBF18370
1CD8      4530 168C             1836           CLH    R3,INDEX                                                  MBF18380
```

```
1CDC  4230 1CFC          1837          BNE    MOD1              BYPASS IF ON-CYLINDER                MBF18390
                         1838  *                                                                     MBF18400
1CE0  9D5A               1839          SSR    FUT,STAT          WAIT FOR SEEK TO COMPLETE            MBF18410
1CE2  4230 217E          1840          BTC    3,DRVERR                                               MBF18420
1CE6  2083               1841          BTBS   8,3                                                    MBF18430
1CE8  9D6A               1842          SSR    DCAD,STAT                                              MBF18440
1CEA  2221               1843          BFBS   IDLE,1                                                 MBF18450
1CEC  DE50 160A          1844          OC     FUT,RSTATT        40MB RESET GATED ATTN                MBF18460
1CF0  9D6A               1845          SSR    DCAD,STAT                                              MBF18470
1CF2  2221               1846          BFBS   IDLE,1                                                 MBF18480
1CF4  9D5A               1847          SSR    FUT,STAT                                               MBF18490
1CF6  08AA               1848          LDAR   STAT,STAT                                              MBF18500
1CF8  4230 217E          1849          BNZ    DRVERR            DRIVE STATUS ERROR                   MBF18510


                         1851  * WRITE WORST-CASE PATTERNS TO FULL CYLINDER, SECTOR-AT-A-TIME.        MBF18530
                         1852  *                                                                     MBF18540
                         1853  * SECTOR ADVANCE SEQUENCE: INITIAL ACCESS IS MADE ON AN ODD-EVEN       MBF18550
                         1854  * BASIS, BEGINNING WITH HEAD 0, SECTOR 0. WHEN ALL EVEN-NUMBERED       MBF18560
                         1855  * SECTORS HAVE BEEN WRITTEN FOR THE CYLINDER, THE ODD SECTORS ARE      MBF18570
                         1856  * WRITTEN, BEGINNING WITH HEAD 0.                                      MBF18580
                         1857  * HEAD   SECTORS                                                      MBF18590
                         1858  * ----   -------                                                      MBF18600
                         1859  *  0     0,2,4,6,...,18 (20)       FIRST REVOLUTION                   MBF18610
                         1860  *  1     0,2,4,6,...,18 (20)       SECOND REVOLUTION                  MBF18620
                         1861  * ETC.                                                                 MBF18630
                         1862  *                                                                     MBF18640
                         1863  * THIS GUARANTEES 1 SECTOR LEAD-TIME FOLLOWING A HEAD SWITCH.         MBF18650
                         1864  *                                                                     MBF18660
                         1865  * TIME TO PROCESS CYLINDER = INITIAL SYNC TIME + 2T(R)*HEADS          MBF18670
                         1866  *                                                                     MBF18680
1CFC  2480               1867  MOD1    LIS    SECT,0                                                 MBF18690
1CFE  2490               1868  WF1.0   LIS    HEAD,0                                                 MBF18700
1D00  41F0 2082          1869  WF1.1   BAL    R15,WFMT          WRITE THE SECTOR                     MBF18710
1D04  2682               1870          AIS    SECT,2                                                 MBF18720
1D06  4580 1678          1871          CLH    SECT,MAXSEC       STILL VALID ?                        MBF18730
1D0A  2085               1872          BLS    WF1.1             BRANCH: YES.                         MBF18740
1D0C  4B80 1678          1873          SH     SECT,MAXSEC       REVERT TO 0/1                        MBF18750
1D10  2691               1874  HADV1   AIS    HEAD,1                                                 MBF18760
1D12  4590 167A          1875          CLH    HEAD,MAXHEAD      STILL VALID ?                        MBF18770
1D16  208B               1876          BLS    WF1.1                                                  MBF18780
1D18  C780 0001          1877          XHI    SECT,1                                                 MBF18790
1D1C  203F               1878          BNZS   WF1.0                                                  MBF18800


                         1880  * 'READ-CHECK' EACH SECTOR IN FORMAT MODE                             MBF18820
                         1881  * TIME TO PROCESS CYLINDER = INITIAL SYNC TIME +                      MBF18830
                         1882  *         2T(R)*HEADS*LPCNT                                           MBF18840
                         1883  *                                                                     MBF18850
1D1E  2404               1884  MOD2    LIS    R0,4              ESTABLISH ITERATION COUNT            MBF18860
1D20  4000 1698          1885  PATLP1  STH    R0,LPCNT                                               MBF18870
                         1886  *                                                                     MBF18880
1D24  2480               1887  FCHK    LIS    SECT,0                                                 MBF18890
1D26  2490               1888  FCK.0   LIS    HEAD,0                                                 MBF18900
```

```
1D28  41F0 2112        1889  FCK.1    BAL    R15,FMRDCK        FORMAT READ CHECK THE SECTOR          MBF18910
1D2C  2682             1890           AIS    SECT,2                                                  MBF18920
1D2E  4580 1678        1891           CLH    SECT,MAXSEC       STILL VALID ?                         MBF18930
1D32  2085             1892           BLS    FCK,1             BRANCH: YES.                          MBF18940
1D34  4880 1678        1893           SH     SECT,MAXSEC       REVERT TO 0/1                         MBF18950
1D38  2691             1894  HADV2    AIS    HEAD,1                                                  MBF18960
1D3A  4590 167A        1895           CLH    HEAD,MAXHEAD      STILL VALID ?                         MBF18970
1D3E  208B             1896           BLS    FCK,1                                                   MBF18980
1D40  C780 0001        1897           XHI    SECT,1                                                  MBF18990
1D44  203F             1898           BNZS   FCK,0                                                   MBF19000
                       1899  *                                                                       MBF19010
1D46  4800 1698        1900           LH     R0,LPCNT                                                MBF19020
1D4A  2701             1901           SIS    R0,1                                                    MBF19030
1D4C  4220 1D20        1902           BP     PATLP1            DO AGAIN !                            MBF19040


                       1904  * READ EACH SECTOR IN THE CYLINDER, CHECKING FOR DATA                   MBF19060
                       1905  * COMPARISON ERRORS AND LRC ERRORS.                                      MBF19070
                       1906  * TIME TO PROCESS CYLINDER = INITIAL SYNC TIME + T(R)*HEADS*INCRMT       MBF19080
                       1907  *                                                                       MBF19090
1D50  2490             1908  MOD3     LIS    HEAD,0                                                  MBF19100
1D52  C8F0 1DE6        1909           LDAI   R15,SECTADV       RETURN ADRS                           MBF19110
1D56  C8E0 2156        1910           LDAI   R14,FLGDST        ERROR RETURN                          MBF19120
1D5A  C8D0 1DAA        1911           LDAI   R13,TUATA         16 BIT XFER VECTOR                    MBF19130
1D5E  4800 14A0        1912           LH     R0,MOD32                                                MBF19140
1D62  2333             1913           BZS    RF1,0                                                   MBF19150
1D64  C8D0 1DCE        1914           LDAI   R13,TUA32         32 BIT XFER VECTOR                    MBF19160
                       1915  *                                                                       MBF19170
                       1916  * READ A SECTOR IN THE FORMAT MODE                                       MBF19180
                       1917  *                                                                       MBF19190
1D68  2480             1918  RF1,0    LIS    SECT,0                                                  MBF19200
      0000 1D6A        1919  RF1,1    EQU    *                                                       MBF19210
1D6A  DE70 160E        1920           OC     SLAD,STOP         STOP SELCH                            MBF19220
1D6E  D870 1662        1921           WH     SLAD,RSA+2        SEND TRANSFER                         MBF19230
1D72  D870 1666        1922           WH     SLAD,RFA+2        LIMITS                                MBF19240
1D76  DE50 160B        1923           OC     FUT,RSTHED        40MB RESET HEAD REGISTER              MBF19250
1D7A  9D6A             1924           SSR    DCAD,STAT                                               MBF19260
1D7C  2221             1925           BFBS   IDLE,1                                                  MBF19270
1D7E  9859             1926           WHR    FUT,HEAD          SEND HEAD ADRS TO DRIVE.              MBF19280
1D80  DE50 160C        1927           OC     FUT,HEDCMD        SET HEAD                              MBF19290
1D84  9D6A             1928           SSR    DCAD,STAT                                               MBF19300
1D86  2221             1929           BFBS   IDLE,1                                                  MBF19310
1D88  9A68             1930           WDR    DCAD,SECT         FORMAT & WRITE                        MBF19320
1D8A  9409             1931           EXBR   R0,HEAD           SECTOR                                MBF19330
1D8C  9102             1932           SLLS   R0,2              HEADER                                MBF19340
1D8E  060B             1933           OAR    R0,TRACK          TO                                    MBF19350
1D90  9860             1934           WHR    DCAD,R0           CONTROLLER                            MBF19360
1D92  DE60 1611        1935           OC     DCAD,RCMD                                               MBF19370
1D96  DE70 160F        1936           OC     SLAD,GOREAD       START SELCH READ                      MBF19380
1D9A  9D7A             1937           SSR    SLAD,STAT                                               MBF19390
1D9C  2081             1938           BTBS   8,1               WAIT FOR SELCH IDLE                   MBF19400
1D9E  DE70 160E        1939           OC     SLAD,STOP         STOP SELCH                            MBF19410
1DA2  9D6A             1940           SSR    DCAD,STAT                                               MBF19420
1DA4  2221             1941           BFBS   IDLE,1            WAIT FOR CONTROLLER IDLE              MBF19430
1DA6  035D             1942           BFCR   5,R13             NORMAL                                MBF19440
```

```
1DA8  030E          1943          BR    R14              ERROR                          MBF19450
                    1944  *                                                             MBF19460
                    1945  * TEST DATA READ.                                            MBF19470
                    1946  *                                                             MBF19480
      0000 1DAA     1947  TDATA   EQU   *                TEST DATA READ FROM SECTOR     MBF19490
1DAA  4800 2948     1948          LH    R0,WTF           GET WRITTEN DATA               MBF19500
1DAE  4810 294A     1949          LH    R1,WTF+2                                        MBF19510
1DB2  2420          1950          LIS   R2,0                                            MBF19520
1DB4  2434          1951          LIS   R3,4                                            MBF19530
1DB6  4840 1688     1952          LH    R4,PRECL                                        MBF19540
1DBA  2742          1953          SIS   R4,2                                            MBF19550
1DBC  4502 2A7C     1954  TDA.1   CLH   R0,RDF(R2)        CHECK DATA READ                MBF19560
1DC0  023E          1955          BNER  R14              FLAG DSTBL                     MBF19570
1DC2  4512 2A7E     1956          CLH   R1,RDF+2(R2)                                    MBF19580
1DC6  023E          1957          BNER  R14                                             MBF19590
1DC8  C120 1DBC     1958          BXLE  R2,TDA.1                                        MBF19600
1DCC  030F          1959          BR    R15              CONTINUE                       MBF19610
                    1960  *                                                             MBF19620
1DCE  5800          1961  TDA32   DC    X'5800',Z(WTF)   *L R0,WTF                      MBF19630
1DD0  2948
1DD2  2410          1962          LIS   R1,0                                            MBF19640
1DD4  2424          1963          LIS   R2,4                                            MBF19650
1DD6  4830 1688     1964          LH    R3,PRECL                                        MBF19660
1DDA  2732          1965          SIS   R3,2                                            MBF19670
1DDC  5501          1966  TDA.2   DC    X'5501',Z(RDF)   *CL R0,RDF(R1)                 MBF19680
1DDE  2A7C
1DE0  023E          1967          BNER  R14              FLAG DSTBL                     MBF19690
1DE2  C110 1DDC     1968          BXLE  R1,TDA.2                                        MBF19700
                    1969  *                                                             MBF19710
                    1970  * ADVANCE TO NEXT SECTOR.                                    MBF19720
                    1971  *                                                             MBF19730
      0000 1DE6     1972  SECTADV EQU   *                ADVANCE TO NEXT SECTOR         MBF19740
1DE6  4A80 1682     1973          AH    SECT,INCRMT      ADVA CE N SECTORS              MBF19750
1DEA  4580 1678     1974          CLH   SECT,MAXSEC                                     MBF19760
1DEE  4280 1D6A     1975          BL    RF1.1                                           MBF19770
1DF2  2681          1976          AIS   SECT,1                                         MBF19780
1DF4  4B80 1679     1977          SH    SECT,MAXSEC                                     MBF19790
1DF8  4580 1682     1978          CLH   SECT,INCRMT                                     MBF19800
1DFC  4280 1D6A     1979          BL    RF1.1                                           MBF19810
1E00  2691          1980          AIS   HEAD,1                                         MBF19820
1E02  4590 167A     1981          CLH   HEAD,MAXHEAD                                    MBF19830
1E06  4280 1D68     1982          BL    RF1.0            DO NEXT TRACK, SAME CYLINDER   MBF19840
                    1983  *                                                             MBF19850
                    1984  *ADVANCE TO NEXT WORST-CASE PATTERN                          MBF19860
                    1985  *                                                             MBF19870
1E0A  4830 168C     1986          LH    R3,INDEX                                        MBF19880
1E0E  2732          1987          SIS   R3,2                                            MBF19890
1E10  4310 1CB2     1988          BNM   PATLOOP          DO NEXT PATTERN.               MBF19900


                    1990  * WRITE PROPER FORMAT TO ENTIRE CYLINDER                     MBF19920
                    1991  * TIME TO PROCESS CYLINDER = INITIAL SYNC TIME + 2T(R)*HEADS  MBF19930
                    1992  *       + FMSUDF DATA SETUP TIME.                           MBF19940
                    1993  *                                                             MBF19950
1E14  41F0 1B1E     1994  MOD4    BAL   R15,FMSUDF         SET UP DATA BUFFER             MBF19960
```

```
1E18  2480           1995  WF2      LIS    SECT,0                                MBF19970
1E1A  2490           1996  WF2.0    LIS    HEAD,0                                MBF19980
1E1C  0809           1997  WF2.1    LDAR   R0,HEAD          FORMAT HEADER        MBF19990
1E1E  910A           1998           SLLS   R0,10                                 MBF20000
1E20  060B           1999           OAR    R0,TRACK                              MBF20010
1E22  9400           2000           EXBR   R0,R0                                 MBF20020
1E24  D200 2949      2001           STB    R0,WTF+1          HEADER BYTE 1       MBF20030
1E28  D280 294A      2002           STB    TRACK,WTF+2       HEADER BYTE 2       MBF20040
1E2C  0808           2003  WF2.2    LDAR   R0,SECT                               MBF20050
1E2E  4600 169C      2004           OH     R0,PROTECT                            MBF20060
1E32  D200 2948      2005           STB    R0,WTF            HEADER BYTE 0       MBF20070
1E36  41F0 2082      2006           BAL    R15,WFMT          WRITE THE SECTOR    MBF20080
1E3A  2682           2007           AIS    SECT,2                                MBF20090
1E3C  4580 1678      2008           CLH    SECT,MAXSEC                           MBF20100
1E40  208A           2009           BLS    WF2.2                                 MBF20110
1E42  4880 1678      2010           SH     SECT,MAXSEC       REVERT TO 0/1       MBF20120
1E46  2691           2011  HADV3    AIS    HEAD,1                                MBF20130
1E48  4590 167A      2012           CLH    HEAD,MAXHEAD                          MBF20140
1E4C  4280 1E1C      2013           BL     WF2.1                                 MBF20150
1E50  C780 0001      2014           XHI    SECT,1                                MBF20160
1E54  4230 1E1A      2015           BNZ    WF2.0                                 MBF20170

                     2017  * PROPER FORMAT ESTABLISHED. DO READ CHECK ON EACH SECTOR.  MBF20190
                     2018  * TIME TO PROCESS CYLINDER = INITIAL SYNC TIME + 2T(R)*HEADS MBF20200
                     2019  *                                                     MBF20210
1E58  2480           2020  MOD5     LIS    SECT,0                                MBF20220
1E5A  2490           2021  RCK.0    LIS    HEAD,0                                MBF20230
1E5C  41F0 20EE      2022  RCK.1    BAL    R15,RCK           READ-CHECK SECTOR   MBF20240
1E60  2682           2023  RCKRTN   AIS    SECT,2                                MBF20250
1E62  4580 1678      2024           CLH    SECT,MAXSEC                           MBF20260
1E66  2085           2025           BLS    RCK,1                                 MBF20270
1E68  4880 1678      2026           SH     SECT,MAXSEC                           MBF20280
1E6C  2691           2027  HADV4    AIS    HEAD,1                                MBF20290
1E6E  4590 167A      2028           CLH    HEAD,MAXHEAD                          MBF20300
1E72  208B           2029           BLS    RCK,1                                 MBF20310
1E74  C780 0001      2030           XHI    SECT,1                                MBF20320
1E78  203F           2031           BNZS   RCK,0                                 MBF20330


                     2033  * ALL SECTORS IN CYLINDER HAVE BEEN TESTED, AND SHOULD  MBF20350
                     2034  * HAVE PROPER FORMAT. DSTBL ENTRIES FOR EACH OF THESE SECTORS MBF20360
                     2035  * ARE INTERPRETED AS FOLLOWS:                          MBF20370
                     2036  *                                                     MBF20380
                     2037  *          1. ENTRY = 0.                              MBF20390
                     2038  *             NO ERROR DETECTED FOR SECTOR.           MBF20400
                     2039  *          2. ENTRY = 1.                              MBF20410
                     2040  *             'SOFT ERROR' DETECTED FOR SECTOR        MBF20420
                     2041  *          3. ENTRY > 1.                              MBF20430
                     2042  *             'HARD ERROR' DETECTED FOR SECTOR        MBF20440
                     2043  *                                                     MBF20450
1E7A  2410           2044  SCANDST  LIS    R1,0              INDEX               MBF20460
1E7C  2421           2045           LIS    R2,1              INCREMENT & COMPARAND MBF20470
1E7E  4830 1696      2046           LH     R3,DSTSIZ         FINAL               MBF20480
```

```
1E82  2731           2047           SIS   R3,1                                          MBF20490
1E84  0421 2448      2048  SCD.1    CLB   R2,DSTBL(R1)      CHECK SECTOR ENTRY          MBF20500
1E88  2324           2049           BNPS  SECTERR                                      MBF20510
1E8A  C110 1E84      2050  SCD.2    BXLE  R1,SCD.1          CONTINUE.                   MBF20520
1E8E  2305           2051           BS    CYLADV1                                       MBF20530
                     2052  *                                                           MBF20540
      0000 1E90      2053  SECTERR  EQU   *                 DECODE SECTOR ERROR TYPE    MBF20550
1E90  4330 1F2A      2054           BE    SOFTERR           ENTRY = 1     SOFT ERROR MESSAGE MBF20560
1E94  4300 1F0E      2055           B     FLAGSECT          ENTRY > 1      FLAG SECTOR  MBF20570


                     2057  * CYLINDER COMPLETE; ADVANCE TO NEXT CYLINDER.              MBF20590
1E98  45B0 15A6      2058  CYLADV1  CLH   TRACK,HICYL+6     ALL CYLINDERS DONE ?        MBF20600
1E9C  2386           2059           BNLS  REDUNCK           BRANCH: YES.                MBF20610
1E9E  41F0 1176      2060           BAL   R15,TSTBRK        CHECK FOR BREAK KEY         MBF20620
1EA2  26B1           2061           AIS   TRACK,1                                       MBF20630
1EA4  4300 1C72      2062           B     FMT.1             DO NEXT CYLINDER            MBF20640


                     2064  * CHECK ALL CYLINDERS FOR REDUNDANT SEEK ERROR.             MBF20660
1EA8  2480           2065  REDUNCK  LIS   SECT,0                                       MBF20670
1EAA  2490           2066           LIS   HEAD,0                                      MBF20680
1EAC  48B0 15A6      2067           LH    TRACK,HICYL+6                               MBF20690
1EB0  C8E0 1F00      2068  REDUN.1  LDAI  R14,CYLADV3       BYPASS ADRS                 MBF20700
1EB4  41F0 1C26      2069           BAL   R15,ILLADD        CHECK INVALID CYLINDER ADRS MBF20710
1EB8  40F0 166C      2070           STA   R15,SKRTRY        SEEK ERROR RERUN ADRS       MBF20720
1EBC  9D6A           2071           SSR   DCAD,STAT         SEEK CYLINDER               MBF20730
1EBE  2221           2072           BFBS  IDLE,1            .                           MBF20740
1EC0  985B           2073           WHR   FUT,TRACK         .                           MBF20750
1EC2  DE50 1612      2074           OC    FUT,CYLCMD        .                           MBF20760
1EC6  9D6A           2075           SSR   DCAD,STAT         .                           MBF20770
1EC8  2221           2076           BFBS  IDLE,1            .                           MBF20780
1ECA  DE50 1613      2077           OC    FUT,SEEK          .                           MBF20790
1ECE  9D6A           2078           SSR   DCAD,STAT         .                           MBF20800
1ED0  2221           2079           BFBS  IDLE,1                                      MBF20810
1ED2  9D5A           2080           SSR   FUT,STAT                                    MBF20820
1ED4  4230 217E      2081           BTC   3,DRVERR                                    MBF20830
1ED8  2083           2082           BTBS  8,3                                         MBF20840
1EDA  DE50 160A      2083           OC    FUT,RSTATT                                  MBF20850
1EDE  9D6A           2084           SSR   DCAD,STAT                                   MBF20860
1EE0  2221           2085           BFBS  IDLE,1                                      MBF20870
1EE2  9D5A           2086           SSR   FUT,STAT                                    MBF20880
1EE4  08AA           2087           LDAR  STAT,STAT                                   MBF20890
1EE6  4230 217E      2088           BNZ   DRVERR                                      MBF20900
                     2089  *                                                           MBF20910
1EEA  41E0 1C0E      2090           BAL   R14,DISPLAY                                 MBF20920
1EEE  41F0 20EE      2091           BAL   R15,RUCK          READ-CHECK SECTOR 0 HEAD 0  MBF20930
1EF2  C3A0 0040      2092           THI   STAT,X'40'        HEADER ERROR ?              MBF20940
1EF6  2335           2093           BZS   CYLADV3           BRANCH: NO.                 MBF20950
1EF8  C3A0 0020      2094           THI   STAT,X'20'        DEFECTIVE SECTOR ?          MBF20960
1EFC  4330 1898      2095           BZ    ERROR5            REDUNDANT SEEK ERROR        MBF20970
                     2096  *                                                           MBF20980
1F00  45B0 159A      2097  CYLADV3  CLH   TRACK,LOCYL+6                                MBF20990
1F04  4330 0E14      2098           BE    TSTEND            DONE. DESELECT DRIVE.       MBF21000
```

```
1F08  27B1           2099          SIS   TRACK,1                                  MBF21010
1F0A  4300 1EB0      2100          B     REDUN,1          CONTINUE.               MBF21020


                     2102  * A DEFECTIVE SECTOR IS TO BE FLAGGED.                 MBF21040
      0000 1F0E      2103  FLAGSECT EQU  *                TO FLAG A SINGLE SECTOR IN DSTBL  MBF21050
1F0E  4010 168E      2104          STH   R1,POINTER       SAVE INDEX              MBF21060
1F12  41E0 1BFA      2105          BAL   R14,RECODE                               MBF21070
1F16  D000 2408      2106          STM   R0,ERRSAVE                               MBF21080
1F1A  41E0 21E6      2107          BAL   R14,FLAGIT                               MBF21090
1F1E  D100 2408      2108          LM    R0,ERRSAVE                               MBF21100
1F22  4810 168E      2109          LH    R1,POINTER       RELOAD INDEX            MBF21110
1F26  4300 1E8A      2110          B     SCD,2                                    MBF21120


                     2112  * A 'SOFT ERROR' MESSAGE IS TO BE PRINTED.             MBF21140
      0000 1F2A      2113  SOFTERR  EQU  *                TO COMMENT ON SOFT ERROR  MBF21150
1F2A  41E0 1BFA      2114          BAL   R14,RECODE                               MBF21160
1F2E  D000 2408      2115          STM   R0,ERRSAVE                               MBF21170
1F32  081B           2116          LDAR  R1,TRACK         CONVERT SECT, HEAD, CYL, LBN TO PRIN  MBF21180
1F34  2403           2117          LIS   R0,3                                     MBF21190
1F36  C820 17C0      2118          LDAI  R2,MSG9+26                               MBF21200
1F3A  41F0 0FBE      2119          BAL   R15,HEXASC                               MBF21210
1F3E  0819           2120          LDAR  R1,HEAD                                  MBF21220
1F40  2402           2121          LIS   R0,2                                     MBF21230
1F42  C820 17C4      2122          LDAI  R2,MSG9+30                               MBF21240
1F46  41F0 0FBE      2123          BAL   R15,HEXASC                               MBF21250
1F4A  0818           2124          LDAR  R1,SECT                                  MBF21260
1F4C  C820 17C7      2125          LDAI  R2,MSG9+33                               MBF21270
1F50  41F0 0FBE      2126          BAL   R15,HEXASC                               MBF21280
1F54  2404           2127          LIS   R0,4                                     MBF21290
1F56  4810 1674      2128          LH    R1,LBN                                   MBF21300
1F5A  C820 17B6      2129          LDAI  R2,MSG9+16                               MBF21310
1F5E  41F0 0FBE      2130          BAL   R15,HEXASC                               MBF21320
1F62  4810 1676      2131          LH    R1,LBN+2                                 MBF21330
1F66  C820 17BA      2132          LDAI  R2,MSG9+20                               MBF21340
1F6A  41F0 0FBE      2133          BAL   R15,HEXASC                               MBF21350
1F6E  C850 17A6      2134          LDAI  R5,MSG9                                  MBF21360
1F72  41F0 101E      2135          BAL   R15,PRINT        'SOFT ERROR...'         MBF21370
1F76  D100 2408      2136          LM    R0,ERRSAVE                               MBF21380
1F7A  4300 1E8A      2137          B     SCD,2                                    MBF21390
```

```
                                2139  * ********************************************************      MBF21410
                                2140  *                                                               MBF21420
                                2141  *                F L A G   M O D U L E                          MBF21430
                                2142  *                                                               MBF21440
                                2143  * PURPOSE OF MODULE:                                           MBF21450
                                2144  * FLG.MOD ALLOWS THE USER TO FLAG A SECTOR (TRACK) AS DEFECTIVE, MBF21460
                                2145  * BY ENTRY OF THE APPROPRIATE COMMAND.                         MBF21470
                                2146  *                                                               MBF21480
                                2147  * ASSUMPTIONS:                                                 MBF21490
                                2148  * THE DISC DRIVE TO BE SELECTED MUST BE ON-LINE AND NOT WRITE-  MBF21500
                                2149  * PROTECTED. THE CONTROLLER FORMAT SWITCH MUST BE IN THE FORMAT MBF21510
                                2150  * POSITION.                                                     MBF21520
                                2151  *                                                               MBF21530
                                2152  * DESIGN SPECIFICATIONS:                                       MBF21540
                                2153  * THE DEF SEC BIT IS SET IN THE HEADER OF THE SPECIFIED SECTOR. MBF21550
                                2154  * THE DATA AND NORMAL MODE LRC FIELDS ARE SET TO ZEROS. THE SECTOR MBF21560
                                2155  * IS THEN READ, WITH DEFECTIVE SECTOR STATUS EXPECTED FROM THE  MBF21570
                                2156  * DISC SYSTEM CONTROLLER; IF THE CORRECT STATUS IS NOT RETURNED, MBF21580
                                2157  * THE MESSAGE 'FLAG REJECTED' IS DISPLAYED. IF FMTSEC = 0, ALL  MBF21590
                                2158  * SECTORS ON THE INDICATED TRACK ARE FLAGGED DEFECTIVE.         MBF21600
                                2159  *                                                               MBF21610
                                2160  * OPERATING PROCEDURES:                                        MBF21620
                                2161  * MOUNT THE DISC PACK ON THE DESIRED DRIVE, AND ENTER THE CORRECT MBF21630
                                2162  * SELCH, DISCON, AND DRIVE OPTIONS. TO FLAG A SECTOR:           MBF21640
                                2163  * ACCEPTABLE INPUTS FOR THE 'FLAG' COMMAND ARE AS FOLLOWS:     MBF21650
                                2164  *                                                               MBF21660
                                2165  * FOR FMTSEC = 0                                               MBF21670
                                2166  *        FLAG MMMMMMMM                                          MBF21680
                                2167  *        FLAG TTT HH                                            MBF21690
                                2168  *                                                               MBF21700
                                2169  * FOR FMTSEC = 1                                               MBF21710
                                2170  *        FLAG MMMMMMMM                                          MBF21720
                                2171  *        FLAG TTT HH KK                                         MBF21730
                                2172  *                                                               MBF21740
                                2173  * WHERE  M = LOGICAL BLOCK ADDRESS                             MBF21750
                                2174  *        T = CYLINDER ADDRESS                                   MBF21760
                                2175  *        H = HEAD ADDRESS                                       MBF21770
                                2176  *        K = SECTOR ADDRESS                                     MBF21780
                                2177  *                                                               MBF21790
                                2178  * OPTIONS:                                                     MBF21800
                                2179  * SELCH, DISCON, DRIVE, PACTYP, FMTSEC                         MBF21810
                                2180  *                                                               MBF21820
                                2181  *                                                               MBF21830
          0000 1F7E             2182  FLG.MOD  EQU    *                                              MBF21840
1F7E      4850 169A             2183           LH     FUT,FUTADRS                                    MBF21850
1F82      4860 156A             2184           LH     DCAD,DISCON+6                                  MBF21860
1F86      4870 1576             2185           LH     SLAD,SELCH+6                                   MBF21870
1F8A      48B0 1690             2186           LH     TRACK,CYLNUM                                   MBF21880
1F8E      4890 1692             2187           LH     HEAD,HEADNUM                                   MBF21890
1F92      4880 1694             2188           LH     SECT,SECTNUM                                   MBF21900
1F96      C8E0 188D             2189           LDAI   R14,ERROR4                                     MBF21910
1F9A      41F0 1C26             2190           BAL    R15,ILLADD      CHECK CE PACK CYL ADRS VIOL    MBF21920
1F9E      40F0 166C             2191           STA    R15,SKRTRY      SEEK ERROR RERUN ADRS          MBF21930
                                2192  *                                                               MBF21940
1FA2      9D6A                  2193           SSR    DCAD,STAT                                      MBF21950
1FA4      2221                  2194           BFBS   IDLE,1                                         MBF21960
```

```
1FA6  DE50 160A  2195          OC    FUT,RSTATT                                MBF21970
1FAA  9D6A       2196          SSR   DCAD,STAT                                 MBF21980
1FAC  2221       2197          BFBS  IDLE,1                                    MBF21990
1FAE  985B       2198          WHR   FUT,TRACK          SEEK CYLINDER          MBF22000
1FB0  9D6A       2199          SSR   DCAD,STAT                                 MBF22010
1FB2  2221       2200          BFBS  IDLE,1                                    MBF22020
1FB4  DE50 1612  2201          OC    FUT,CTLCMD                                MBF22030
1FB8  9D6A       2202          SSR   DCAD,STAT                                 MBF22040
1FBA  2221       2203          BFBS  IDLE,1                                    MBF22050
1FBC  DE50 1613  2204          OC    FUT,SEEK                                  MBF22060
                 2205  *                                                       MBF22070
1FC0  41F0 1B1E  2206          BAL   R15,FMSUDF       SET UP HEADER, DATA FIELDS MBF22080
                 2207  *                                                       MBF22090
1FC4  9D6A       2208          SSR   DCAD,STAT                                 MBF22100
1FC6  2221       2209          BFBS  IDLE,1                                    MBF22110
1FC8  9D5A       2210          SSR   FUT,STAT                                  MBF22120
1FCA  4230 217E  2211          BTC   3,DRVERR         DRIVE STATUS ERROR       MBF22130
1FCE  2083       2212          BTBS  8,3                                       MBF22140
1FD0  DE50 160A  2213          OC    FUT,RSTATT                                MBF22150
1FD4  9D6A       2214          SSR   DCAD,STAT                                 MBF22160
1FD6  2221       2215          BFBS  IDLE,1                                    MBF22170
1FD8  9D5A       2216          SSR   FUT,STAT                                  MBF22180
1FDA  08AA       2217          LDAR  STAT,STAT                                 MBF22190
1FDC  4230 217E  2218          BNZ   DRVERR           DRIVE STATUS ERROR       MBF22200
                 2219  *                                                       MBF22210
                 2220  * FLAG THE SECTOR OR TRACK.                             MBF22220
                 2221  *                                                       MBF22230
1FE0  41E0 21E6  2222          BAL   R14,FLAGIT       FLAG SECTOR              MBF22240
1FE4  4300 0AE2  2223          B     OPTIN            EXIT                     MBF22250
```

```
                                2225  * ************************************************                MBF22270
                                2226  *                                                               MBF22280
                                2227  *              C L E A R   M O D U L E                          MBF22290
                                2228  *                                                               MBF22300
                                2229  * PURPOSE OF MODULE:                                            MBF22310
                                2230  * CLR.MOD ALLOWS THE CUSTOMER ENGINEER (CE) TO REMOVE ALL RECORDED  MBF22320
                                2231  * INFORMATION FROM A SPECIFIED AREA OF THE DISC PACK.           MBF22330
                                2232  *                                                               MBF22340
                                2233  * ASSUMPTIONS:                                                  MBF22350
                                2234  * THE DISC DRIVE TO BE SELECTED MUST BE ON-LINE AND NOT WRITE-   MBF22360
                                2235  * PROTECTED. THE CONTROLLER FORMAT SWITCH MUST BE IN THE FORMAT  MBF22370
                                2236  * POSITION.                                                     MBF22380
                                2237  *                                                               MBF22390
                                2238  * DESIGN SPECIFICATIONS:                                        MBF22400
                                2239  * ALL SECTORS FROM LOCYL:HICYL, INCLUSIVELY, ARE WRITTEN TO THE  MBF22410
                                2240  * DISC WITH SECTOR HEADER, GAP, SYNC, DATA, AND NORMAL AND FORMAT MODE  MBF22420
                                2241  * LRC FIELDS SET TO ZERO.                                       MBF22430
                                2242  *                                                               MBF22440
                                2243  * 'INVALID' CYLINDER ADDRESSES ARE BYPASSED, FOR CE PACKS.      MBF22450
                                2244  *                                                               MBF22460
                                2245  * OPERATING PROCEDURES:                                         MBF22470
                                2246  * ENSURE THAT THE REQUIRED DRIVE IS ON-LINE, WITH THE           MBF22480
                                2247  * DESIRED DISC PACK MOUNTED. ENTER THE CORRECT PACTYP           MBF22490
                                2248  * OPTION, AND THE LOCYL AND HICYL OPTIONS DESIRED.             MBF22500
                                2249  * TO REMOVE RECORDED INFORMATION, ENTER 'CLEAR'.               MBF22510
                                2250  *                                                               MBF22520
                                2251  *       *****     C A U T I O N     *****                     MBF22530
                                2252  *                                                               MBF22540
                                2253  * THE CLEAR COMMAND CAUSES THE DESTRUCTION OF SECTOR HEADERS    MBF22550
                                2254  * AND RECORDED DATA FOR ALL SECTORS FROM LOCYL:HICYL.           MBF22560
                                2255  * THIS HAPPENS VERY QUICKLY. THE CLEAR COMMAND SHOULD NOT       MBF22570
                                2256  * NORMALLY BE USED, EXCEPT BY THE CUSTOMER ENGINEER.           MBF22580
                                2257  *                                                               MBF22590
                                2258  * OPTIONS:                                                      MBF22600
                                2259  * SELCH, DISCON, DRIVE, PACTYP, LOCYL, HICYL                    MBF22610
                                2260  *                                                               MBF22620
                                2261  *                                                               MBF22630
 0000 1FE8                      2262  CLR.MOD  EQU   *                  TO WRITE ALL ZEROS, LOCYL:HICYL  MBF22640
 1FE8 4850 169A                 2263           LH    FUT,FUTADRS                                      MBF22650
 1FEC 4860 156A                 2264           LH    DCAD,DISCON+6                                    MBF22660
 1FF0 4870 1576                 2265           LH    SLAD,SELCH+6                                     MBF22670
 1FF4 2400                      2266           LIS   R0,0                                             MBF22680
 1FF6 2410                      2267           LIS   R1,0                                             MBF22690
 1FF8 2422                      2268           LIS   R2,2                                             MBF22700
 1FFA 4830 1688                 2269           LH    R3,PRECL                                         MBF22710
 1FFE 2732                      2270           SIS   R3,2                                             MBF22720
 2000 4001 2948                 2271  CLR.0    STH   R0,WTF(R1)          ZERO WRITE BUFFER          MBF22730
 2004 C110 2000                 2272           BXLE  R1,CLR.0                                         MBF22740
                                2273  *                                                               MBF22750
 2008 48B0 159A                 2274  CLR.1    LH    TRACK,LOCYL+6                                    MBF22760
 200C C8E0 2070                 2275  CLR.2    LOAI  R14,CYLADV2                                      MBF22770
 2010 41F0 1C26                 2276           BAL   R15,ILLADD           CHECK CE PACK CYL ADRS VIOL  MBF22780
 2014 40F0 166C                 2277           STA   R15,SKRTRY           SEEK ERROR RERUN ADRS       MBF22790
 2018 9D6A                      2278           SSR   DCAD,STAT            SEEK CYLINDER               MBF22800
 201A 2221                      2279           BFBS  IDLE,1               .                           MBF22810
 201C DE50 160A                 2280           OC    FUT,RSTATT                                       MBF22820
```

```
2020  9D6A           2281          SSR   DCAD,STAT                                MBF22830
2022  2221           2282          BFBS  IDLE,1                                   MBF22840
2024  985B           2283          WHR   FUT,TRACK          .                      MBF22850
2026  DE50 1612      2284          OC    FUT,CYLCMD         .                      MBF22860
202A  9D6A           2285          SSR   DCAD,STAT          .                      MBF22870
202C  2221           2286          BFBS  IDLE,1             .                      MBF22880
202E  DE50 1613      2287          OC    FUT,SEEK           .                      MBF22890
2032  9D6A           2288          SSR   DCAD,STAT          .                      MBF22900
2034  2221           2289          BFBS  IDLE,1             .                      MBF22910
2036  9D5A           2290          SSR   FUT,STAT           .                      MBF22920
2038  4230 217E      2291          BTC   3,DRVERR                                   MBF22930
203C  2083           2292          BTBS  8,3                                        MBF22940
203E  DE50 160A      2293          OC    FUT,RSTATT                               MBF22950
2042  9D6A           2294          SSR   DCAD,STAT                                MBF22960
2044  2221           2295          BFBS  IDLE,1                                   MBF22970
2046  9D5A           2296          SSR   FUT,STAT                                 MBF22980
2048  08AA           2297          LDAR  STAT,STAT          .                      MBF22990
204A  4230 217E      2298          BNZ   DRVERR                                   MBF23000


204E  2480           2300  CM001   LIS   SECT,0                                   MBF23020
2050  2490           2301  CM1.0   LIS   HEAD,0                                   MBF23030
2052  41F0 2082      2302  CM1.1   BAL   R15,WFMT           WRITE ZEROS TO SECTOR  MBF23040
2056  2682           2303          AIS   SECT,2                                   MBF23050
2058  4580 1678      2304          CLH   SECT,MAXSEC        STILL VALID ?          MBF23060
205C  2085           2305          BLS   CM1.1                                    MBF23070
205E  4880 1678      2306          SH    SECT,MAXSEC                              MBF23080
2062  2691           2307          AIS   HEAD,1                                   MBF23090
2064  4590 167A      2308          CLH   HEAD,MAXHEAD                            MBF23100
2068  208B           2309          BLS   CM1.1                                    MBF23110
206A  C780 0001      2310          XHI   SECT,1                                   MBF23120
206E  203F           2311          BNZS  CM1.0                                    MBF23130
                     2312  *                                                      MBF23140
2070  4580 15A6      2313  CYLADV2 CLH   TRACK,HICYL+6     ALL CYLINDERS DONE ?   MBF23150
2074  4380 0AE2      2314          BNL   OPTIN              EXIT                   MBF23160
2078  2681           2315          AIS   TRACK,1                                  MBF23170
207A  41F0 1176      2316          BAL   R15,TSTBRK                               MBF23180
207E  4300 200C      2317          B     CLR.2                                    MBF23190
```

```
                0000 2082          2319  WFMT    EQU   *              WRITES 1 SECTOR IN FORMAT MODE      MBF23210
           2082 DE70 160E          2320        OC    SLAD,STOP      STOP SELCH                          MBF23220
           2086 D870 165A          2321        WH    SLAD,WSA+2     SEND TRANSFER                       MBF23230
           208A D870 165E          2322        WH    SLAD,WFA+2     LIMITS                              MBF23240
           208E DE50 160B          2323        OC    FUT,RSTHED     40MB RESET HEAD REGISTER            MBF23250
           2092 9D6A               2324        SSR   DCAD,STAT                                        MBF23260
           2094 2221               2325        BFBS  IDLE,1                                          MBF23270
           2096 9859               2326        WHR   FUT,HEAD       SEND HEAD ADRS TO DRIVE,            MBF23280
           2098 DE50 160C          2327        OC    FUT,HEDCMD     SET HEAD.                           MBF23290
           209C 9D6A               2328        SSR   DCAD,STAT                                        MBF23300
           209E 2221               2329        BFBS  IDLE,1                                          MBF23310
           20A0 9A68               2330        WDR   DCAD,SECT      FORMAT & WRITE                      MBF23320
           20A2 9409               2331        EXBR  R0,HEAD        SECTOR                              MBF23330
           20A4 9102               2332        SLLS  R0,2           HEADER                              MBF23340
           20A6 060B               2333        OAR   R0,TRACK       TO                                  MBF23350
           20A8 9860               2334        WHR   DCAD,R0        CONTROLLER.                         MBF23360
           20AA DE60 160D          2335        OC    DCAD,WCMD      START CONTROLLER WRITE              MBF23370
           20AE DE70 1610          2336        OC    SLAD,GOWRITE   START SELCH WRITE.                  MBF23380
           20B2 41E0 1C0E          2337        BAL   R14,DISPLAY     DISPLAY PANEL                       MBF23390
           20B6 4300 2136          2338        B     SLCHWT         WAIT 'TIL COMPLETE;                 MBF23400
                                   2339  *                          RETURN ON R15 THROUGH               MBF23410
                                   2340  *                          STATCHK ROUTINE.                    MBF23420

                0000 20BA          2342  RFMT    EQU   *              READS ONE SECTOR IN FORMAT MODE     MBF23440
           20BA DE70 160E          2343        OC    SLAD,STOP      STOP SELCH                          MBF23450
           20BE D870 1662          2344        WH    SLAD,RSA+2     SEND TRANSFER                       MBF23460
           20C2 D870 1666          2345        WH    SLAD,RFA+2     LIMITS                              MBF23470
           20C6 DE50 160B          2346        OC    FUT,RSTHED     40MB RESET HEAD REGISTER            MBF23480
           20CA 9D6A               2347        SSR   DCAD,STAT                                        MBF23490
           20CC 2221               2348        BFBS  IDLE,1                                          MBF23500
           20CE 9859               2349        WHR   FUT,HEAD       SEND HEAD ADRS TO DRIVE,            MBF23510
           20D0 DE50 160C          2350        OC    FUT,HEDCMD     SET HEAD                            MBF23520
           20D4 9D6A               2351        SSR   DCAD,STAT                                        MBF23530
           20D6 2221               2352        BFBS  IDLE,1                                          MBF23540
           20D8 9A68               2353        WDR   DCAD,SECT      FORMAT & WRITE                      MBF23550
           20DA 9409               2354        EXBR  R0,HEAD        SECTOR                              MBF23560
           20DC 9102               2355        SLLS  R0,2           HEADER                              MBF23570
           20DE 060B               2356        OAR   R0,TRACK       TO                                  MBF23580
           20E0 9860               2357        WHR   DCAD,R0        CONTROLLER                          MBF23590
           20E2 DE60 1611          2358        OC    DCAD,RCMD                                         MBF23600
           20E6 DE70 160F          2359        OC    SLAD,GOREAD    START SELCH READ                    MBF23610
           20EA 4300 2136          2360        B     SLCHWT         WAIT 'TIL COMPLETE;                 MBF23620
                                   2361  *                          RETURN ON R15 THROUGH               MBF23630
                                   2362  *                          STATCHK ROUTINE.                    MBF23640

                0000 20EE          2364  RDCK    EQU   *              READ-CHECKS ONE SECTOR              MBF23660
           20EE DE50 160B          2365        OC    FUT,RSTHED     40MB RESET HEAD REGISTER            MBF23670
           20F2 9D6A               2366        SSR   DCAD,STAT                                        MBF23680
           20F4 2221               2367        BFBS  IDLE,1                                          MBF23690
           20F6 9859               2368        WHR   FUT,HEAD       SEND HEAD ADRS TO DRIVE,            MBF23700
           20F8 DE50 160C          2369        OC    FUT,HEDCMD     SET HEAD.                           MBF23710
           20FC 9D6A               2370        SSR   DCAD,STAT                                        MBF23720
```

```
20FE 2221            2371          BFBS   IDLE,1                                MBF23730
2100 9A68            2372          WDR    DCAD,SECT          FORMAT & WRITE     MBF23740
2102 9409            2373          EXBR   R0,HEAD            SECTOR             MBF23750
2104 9102            2374          SLLS   R0,2               HEADER             MBF23760
2106 060B            2375          OAR    R0,TRACK           TO                 MBF23770
2108 9860            2376          WHR    DCAD,R0            CONTROLLER         MBF23780
210A DE60 1614       2377          OC     DCAD,RCHECK        START CONTROLLER READ-CHECK MBF23790
210E 4300 213E       2378          B      CTRLWT             WAIT 'TIL  COMPLETE; MBF23800
                     2379  *                                 RETURN ON R15 THROUGH MBF23810
                     2380  *                                 STATCHK ROUTINE.   MBF23820

     0000 2112       2382  FMRDCK  EQU    *                  FORMAT READ-CHECKS ONE SECTOR MBF23840
2112 DE50 160B       2383          OC     FUT,RSTHED         40MB RESET HEAD REGISTER MBF23850
2116 9D6A            2384          SSR    DCAD,STAT                             MBF23860
2118 2221            2385          BFBS   IDLE,1                               MBF23870
211A 9859            2386          WHR    FUT,HEAD                              MBF23880
211C DE50 160C       2387          OC     FUT,HEDCMD         SET HEAD           MBF23890
2120 9D6A            2388          SSR    DCAD,STAT                             MBF23900
2122 2221            2389          BFBS   IDLE,1                               MBF23910
2124 9A68            2390          WDR    DCAD,SECT                             MBF23920
2126 9409            2391          EXBR   R0,HEAD                              MBF23930
2128 9102            2392          SLLS   R0,2                                 MBF23940
212A 060B            2393          OAR    R0,TRACK                              MBF23950
212C 9860            2394          WHR    DCAD,R0                               MBF23960
212E DE60 1611       2395          OC     DCAD,RCMD          START CONTROLLER FORMAT READ MBF23970
2132 4300 213E       2396          B      CTRLWT             WAIT 'TIL COMPLETE; MBF23980
                     2397  *                                 RETURN ON R15 THROUGH MBF23990
                     2398  *                                 STATCHK ROUTINE.   MBF24000


                     2400  * WAIT FOR I/O TO COMPLETE.                          MBF24020
                     2401  *                                                    MBF24030
     0000 2136       2402  SLCHWT  EQU    *                                     MBF24040
2136 9D7A            2403          SSR    SLAD,STAT                             MBF24050
2138 2081            2404          BTBS   8,1                                   MBF24060
213A DE70 160E       2405          OC     SLAD,STOP                             MBF24070
213E 9D6A            2406  CTRLWT  SSR    DCAD,STAT                             MBF24080
2140 2221            2407          BFBS   IDLE,1                               MBF24090
2142 035F            2408          BFCR   5,R15              RETURN TO MAIN     MBF24100
                     2409  *                                                    MBF24110
                     2410  * ABNORMAL TERMINATION.                             MBF24120
2144 9D5A            2411  STATCHK SSR    FUT,STAT                              MBF24130
2146 08AA            2412          LDAR   STAT,STAT                            MBF24140
2148 4230 217E       2413          BNZ    DRVERR              DRIVE STATUS ERROR MBF24150
214C 9D6A            2414          SSR    DCAD,STAT                             MBF24160
214E C3A0 0080       2415          THI    STAT,X'80'          FORMAT SWITCH ON 7 MBF24170
2152 4230 18C0       2416          BNZ    ERROR11                               MBF24180
                     2417  *                                                    MBF24190
                     2418  * SECTOR ERROR, INCREMENT SECTOR'S DSTBL TALLY.      MBF24200
2156 2410            2419  FLGDST  LIS    R1,0                FLAG DSTBL ENTRY   MBF24210
2158 0809            2420          LDAR   R0,HEAD             COMPUTE DSTBL INDEX MBF24220
215A 2701            2421  FDST.1  SIS    R0,1                .                  MBF24230
215C 2114            2422          BMS    FDST.2              .                  MBF24240
```

```
215E 4A10 1678  2423          AH    R1,MAXSEC          .                              MBF24250
2162 2204       2424          BS    FDST,1             .                              MBF24260
2164 0A18       2425  FDST,2  AAR   R1,SECT            .                              MBF24270
2166 D301 2448  2426          LB    R0,DSTBL(R1)       TALLY THE ERROR                MBF24280
216A 2601       2427          AIS   R0,1               .                              MBF24290
216C D201 2448  2428          STB   R0,DSTBL(R1)       .                              MBF24300
2170 C5F0 1E60  2429          CLAI  R15,RCKRTN                                        MBF24310
2174 023F       2430          BNEK  R15                                               MBF24320
2176 240F       2431          LIS   R0,15                                             MBF24330
2178 D201 2448  2432          STB   R0,DSTBL(R1)       GUARANTEE SECTOR FLAG          MBF24340
217C 030F       2433          BR    R15                RETURN TO CALLER               MBF24350


                2435  * DRIVE ERROR STATUS RECOVERY ROUTINE.                          MBF24370
                2436  *                                                               MBF24380
     0000 217E  2437  DRVERR  EQU   *                  DRIVE STATUS ERROR DETECTED    MBF24390
217E 4800 1680  2438          LH    R0,SKCNT                                          MBF24400
2182 2701       2439          SIS   R0,1                                              MBF24410
2184 4320 21D2  2440          BNP   DRVR.3             BRANCH: RETRY COUNT EXHAUSTED. MBF24420
2188 4000 1680  2441          STH   R0,SKCNT                                          MBF24430
                2442  *                                                               MBF24440
218C DE70 160E  2443          OC    SLAD,STOP                                         MBF24450
2190 DE50 160B  2444          OC    FUT,RSTHED         40MB RESET HEAD REGISTER       MBF24460
2194 9D6A       2445          SSR   DCAD,STAT                                        MBF24470
2196 2221       2446          BFBS  IDLE,1                                            MBF24480
2198 2400       2447          LIS   R0,0                                              MBF24490
219A 9850       2448          WHR   FUT,R0                                            MBF24500
219C DE50 160C  2449          OC    FUT,HEDCMD         SET HEAD.                      MBF24510
21A0 9D6A       2450          SSR   DCAD,STAT                                        MBF24520
21A2 2221       2451          BFBS  IDLE,1                                            MBF24530
                2452  *                                                               MBF24540
21A4 DE50 160A  2453  DRVR.1  OC    FUT,RSTATT         RESET GATED ATTN               MBF24550
21A8 9D6A       2454          SSR   DCAD,STAT                                        MBF24560
21AA 2221       2455          BFBS  IDLE,1                                            MBF24570
21AC DE50 1616  2456          OC    FUT,RESTOC         RESTORE.                       MBF24580
21B0 9D6A       2457          SSR   DCAD,STAT                                        MBF24590
21B2 2221       2458          BFBS  IDLE,1                                            MBF24600
21B4 9D5A       2459          SSR   FUT,STAT                                        MBF24610
21B6 4210 217E  2460          BTC   1,DRVERR                                        MBF24620
21BA 2083       2461          BTBS  8,3                                             MBF24630
21BC DE50 160A  2462          OC    FUT,RSTATT         RESET GATED ATTN               MBF24640
21C0 9D6A       2463          SSR   DCAD,STAT                                        MBF24650
21C2 2221       2464          BFBS  IDLE,1                                            MBF24660
21C4 9D5A       2465          SSR   FUT,STAT                                        MBF24670
21C6 08AA       2466          LDAR  STAT,STAT                                       MBF24680
21C8 4230 217E  2467          BNZ   DRVERR                                          MBF24690
                2468  *                                                               MBF24700
21CC 48F0 166C  2469          LDA   R15,SKRTRY                                      MBF24710
21D0 030F       2470          BR    R15                RETRY SEEK                     MBF24720
                2471  *                                                               MBF24730
21D2 C5A0 0009  2472  DRVR.3  CLHI  STAT,X'09'          DRIVE OFF-LINE ?               MBF24740
21D6 4330 18B0  2473          BE    ERROR8                                            MBF24750
21DA C3A0 0080  2474          THI   STAT,X'80'         DRIVE WRITE-PROTECTED ?        MBF24760
21DE 4230 18A8  2475          BNZ   ERROR7                                          MBF24770
21E2 4300 18CC  2476          B     ERROR13            OTHER BAD DRIVE STATUS         MBF24780
```

```
                                2478  * SUBROUTINE FLAGIT FLAGS THE SPECIFIED SECTOR OR TRACK, TESTS THE      MBF24800
                                2479  * FLAGGED SECTOR(S), AND OUTPUTS APPROPRIATE ERROR MESSAGES.           MBF24810
                                2480  * REGISTERS DESTROYED: R0,R1,R2,R15,SECT                               MBF24820
                                2481  *                                                                      MBF24830
          0000 21E6             2482  FLAGIT   EQU    *                                                     MBF24840
   21E6   40E0 1668             2483           STA    R14,FLAGRET                                           MBF24850
   21EA   4800 158E             2484           LH     R0,FMTSEC+6                                           MBF24860
   21EE   2137                  2485           BNZS   FLG.1                                                 MBF24870
   21F0   4800 1678             2486           LH     R0,MAXSEC                                             MBF24880
   21F4   0B08                  2487           SAR    R0,SECT                                               MBF24890
   21F6   6100 168E             2488           AHM    R0,POINTER                                            MBF24900
   21FA   2480                  2489           LIS    SECT,0                                                MBF24910
   21FC   081B                  2490  FLG.1    LDAR   R1,TRACK          CONVT CYL ADRS TO PRINT              MBF24920
   21FE   2403                  2491           LIS    R0,3                                                  MBF24930
   2200   C820 172E             2492           LDAI   R2,MSG5+26                                            MBF24940
   2204   41F0 0FBE             2493           BAL    R15,HEXASC                                            MBF24950
   2208   C820 1754             2494           LDAI   R2,MSG6+26                                            MBF24960
   220C   41F0 0FBE             2495           BAL    R15,HEXASC                                            MBF24970
   2210   C820 1776             2496           LDAI   R2,MSG7+26                                            MBF24980
   2214   41F0 0FBE             2497           BAL    R15,HEXASC                                            MBF24990
                                2498  *                                                                      MBF25000
   2218   0819                  2499           LDAR   R1,HEAD           CONVT HEAD ADRS TO PRINT             MBF25010
   221A   2402                  2500           LIS    R0,2                                                  MBF25020
   221C   C820 1732             2501           LDAI   R2,MSG5+30                                            MBF25030
   2220   41F0 0FBE             2502           BAL    R15,HEXASC                                            MBF25040
   2224   C820 1758             2503           LDAI   R2,MSG6+30                                            MBF25050
   2228   41F0 0FBE             2504           BAL    R15,HEXASC                                            MBF25060
   222C   C820 177A             2505           LDAI   R2,MSG7+30                                            MBF25070
   2230   41F0 0FBE             2506           BAL    R15,HEXASC                                            MBF25080
   2234   2402                  2507  FLG.2    LIS    R0,2                                                  MBF25090
   2236   0818                  2508           LDAR   R1,SECT           CONVT SECTOR ADRS TO PRINT           MBF25100
   2238   C820 177D             2509           LDAI   R2,MSG7+33                                            MBF25110
   223C   41F0 0FBE             2510           BAL    R15,HEXASC                                            MBF25120
   2240   C820 1735             2511           LDAI   R2,MSG5+33                                            MBF25130
   2244   41F0 0FBE             2512           BAL    R15,HEXASC                                            MBF25140
                                2513  *                                                                      MBF25150
   2248   41E0 1B58             2514           BAL    R14,ENCODE        GET LBN,                            MBF25160
   224C   4810 1674             2515           LH     R1,LBN            AND CONVT TO PRINT                  MBF25170
   2250   2404                  2516           LIS    R0,4                                                  MBF25180
   2252   C820 1724             2517           LDAI   R2,MSG5+16                                            MBF25190
   2256   41F0 0FBE             2518           BAL    R15,HEXASC                                            MBF25200
   225A   C820 174A             2519           LDAI   R2,MSG6+16                                            MBF25210
   225E   41F0 0FBE             2520           BAL    R15,HEXASC                                            MBF25220
   2262   C820 176C             2521           LDAI   R2,MSG7+16                                            MBF25230
   2266   41F0 0FBE             2522           BAL    R15,HEXASC                                            MBF25240
   226A   4810 1676             2523           LH     R1,LBN+2                                              MBF25250
   226E   C820 1728             2524           LDAI   R2,MSG5+20                                            MBF25260
   2272   41F0 0FBE             2525           BAL    R15,HEXASC                                            MBF25270
   2276   C820 174E             2526           LDAI   R2,MSG6+20                                            MBF25280
   227A   41F0 0FBE             2527           BAL    R15,HEXASC                                            MBF25290
   227E   C820 1770             2528           LDAI   R2,MSG7+20                                            MBF25300
   2282   41F0 0FBE             2529           BAL    R15,HEXASC                                            MBF25310
                                2530  *                                                                      MBF25320
```

```
2286  0809           2531  FLG.3   LDAR  R0,HEAD       BUILD HEADER, SETTING DEF SEC      MBF25330
2288  910A           2532          SLLS  R0,10                                           MBF25340
228A  060B           2533          OAR   R0,TRACK                                        MBF25350
228C  9400           2534          EXBR  R0,R0                                           MBF25360
228E  0200 2949      2535          STB   R0,WTF+1      HEADER BYTE 1                     MBF25370
2292  02B0 294A      2536          STB   TRACK,WTF+2   HEADER BYTE 2                     MBF25380
2296  C808 0080      2537          LHI   R0,X'80'(SECT)                                  MBF25390
229A  0200 2948      2538          STB   R0,WTF        HEADER BYTE 0                     MBF25400
229E  41F0 2082      2539          BAL   R15,WFMT      FLAG SECTOR                       MBF25410
22A2  C850 1714      2540          LDAI  R5,MSG5       'DEF SEC FLAGGED...'              MBF25420
22A6  4800 158E      2541          LH    R0,FMTSEC+6                                     MBF25430
22AA  2135           2542          BNZS  TEST0                                           MBF25440
22AC  0888           2543          LDAR  SECT,SECT     DEF TRK MSG FOR SECTOR 0 ONLY.    MBF25450
22AE  2135           2544          BNZS  TEST1                                           MBF25460
22B0  C850 173A      2545          LDAI  R5,MSG6       'DEF TRK FLAGGED...'              MBF25470
22B4  41F0 101E      2546  TEST0   BAL   R15,PRINT                                       MBF25480
22B8  4850 169A      2547  TEST1   LH    FUT,FUTADRS                                     MBF25490
22BC  41F0 20EE      2548          BAL   R15,RDCK                                        MBF25500
22C0  9D6A           2549          SSR   DCAD,STAT                                       MBF25510
22C2  C3A0 0020      2550          THI   STAT,X'20'    DEFECTIVE SECTOR STATUS ?         MBF25520
22C6  2137           2551          BNZS  TST.1                                           MBF25530
22C8  C850 175C      2552          LDAI  R5,MSG7       'FLAG REJECTED...'                MBF25540
22CC  41F0 101E      2553          BAL   R15,PRINT                                       MBF25550
22D0  4850 169A      2554          LH    FUT,FUTADRS                                     MBF25560
22D4  48E0 1668      2555  TST.1   LDA   R14,FLAGRET                                     MBF25570
22D8  4800 158E      2556          LH    R0,FMTSEC+6                                     MBF25580
22DC  023E           2557          BNZR  R14           FMTSEC = 1: RETURN                MBF25590
22DE  2681           2558          AIS   SECT,1                                          MBF25600
22E0  4580 1678      2559          CLH   SECT,MAXSEC                                     MBF25610
22E4  038E           2560          BNLR  R14                                             MBF25620
22E6  4300 2234      2561          B     FLG.2         FMTSEC = 0: DO COMPLETE TRACK.    MBF25630
```

```
      0000 22E9          2563  LNZB     EQU   *-1                                    MBF25650
22EA                     2564           ALIGN 2                                      MBF25660
22EA                     2565  OPTBUF   DS    80                                     MBF25670
233A                     2566  IOSAVE   DS    2                                      MBF25680
233C                     2567  TEMP     DS    2                                      MBF25690
2340                     2568           ALIGN 8                                      MBF25700
2340                     2569  PSWSAVE  DS    8                                      MBF25710
2348                     2570  RSAVE    DS    128                                    MBF25720
23C8                     2571  INTSAV   DS    64                                     MBF25730
2408                     2572  ERRSAVE  DS    64                                     MBF25740
2448                     2573  OSTBL    DS    1280      DEFECTIVE SECTOR TABLE       MBF25750
2948                     2574           ALIGN 4                                      MBF25760
2948                     2575  WTF      DS    308       WRITE BUFFER               MBF25770
2A7C                     2576           ALIGN 4                                      MBF25780
2A7C                     2577  RDF      DS    308       READ BUFFER                MBF25790
```

CHKSUM/M17 PUNCHER

```
2BB0  2400           2579  $CHKSUM  LIS   R0,0          PUNCH M17 TAPE WITH CHECKSUM          M8F25810
2BB2  9510           2580        EPSR  R1,R0           SELECT REG. SET 0                     M8F25820
                     2581  *                                                                  M8F25830
2BB4  C810 0A00      2582        LDAI  R1,ORIGIN1       START                                 M8F25840
2BB8  2421           2583        LIS   R2,1             INCREMENT                             M8F25850
2BBA  C830 22E9      2584        LDAI  R3,LNZB          FINAL                                 M8F25860
2BBE  2440           2585        LIS   R4,0             CHECKSUM BYTE                         M8F25870
2BC0  D351 0000      2586  $GEN  LB    R5,0(R1)                                              M8F25880
2BC4  0745           2587        XAR   R4,R5                                                 M8F25890
2BC6  C110 2BC0      2588        BXLE  R1,$GEN                                               M8F25900
2BCA  D240 0097      2589        STB   R4,MN+3          CHECKSUM BYTE TO BOOT LOADER          M8F25910
                     2590  *                                                                  M8F25920
2BCE  C810 0080      2591  $TAPE LHI   R1,X'0080'                                            M8F25930
2BD2  9E21           2592        OCR   R2,R1            DISPLAY : NORMAL MODE                 M8F25940
2BD4  9444           2593        EXBR  R4,R4                                                 M8F25950
2BD6  9824           2594        WHR   R2,R4            CHECKSUM BYTE TO D1                   M8F25960
2BD8  9411           2595        EXBR  R1,R1                                                 M8F25970
2BDA  9501           2596        EPSR  R0,R1            HALT PROCESSOR.                       M8F25980


2BDC  D360 007A      2598  $PUNCH  LB    R6,X'7A'       GET BOUTDV (PUNCH) ADDRESS.           M8F26000
2BE0  DE60 007B      2599        OC    R6,X'7B'         START TAPE PUNCH                      M8F26010
2BE4  9D60           2600        SSR   R6,R0                                                 M8F26020
2BE6  2081           2601        BTBS  8,1                                                   M8F26030
2BE8  41F0 2C2A      2602        BAL   R15,$TAPL        PUNCH LEADER                          M8F26040
2BEC  9411           2603        EXBR  R1,R1            (R1) = X'0080'                        M8F26050
2BEE  C830 00CF      2604        LHI   R3,X'CF'                                              M8F26060
2BF2  DA61 0000      2605  $PNCH1  WD   R6,0(R1)        PUNCH BOOT LOADER                     M8F26070
2BF6  9D60           2606        SSR   R6,R0                                                 M8F26080
2BF8  2081           2607        BTBS  8,1                                                   M8F26090
2BFA  C110 2BF2      2608        BXLE  R1,$PNCH1                                             M8F26100
2BFE  41F0 2C30      2609        BAL   R15,$TAPL1       PUNCH ONE-FOLD GAP.                   M8F26110
                     2610  *                                                                  M8F26120
2C02  D340 0097      2611        LB    R4,MN+3          GET CHECKSUM BYTE                     M8F26130
2C06  C810 0A00      2612        LDAI  R1,ORIGIN1       (NORMALLY X'A00')                     M8F26140
2C0A  C830 22E9      2613        LDAI  R3,LNZB                                               M8F26150
2C0E  D351 0000      2614  $PNCH2  LB    R5,0(R1)         PUNCH PROGRAM                       M8F26160
2C12  0745           2615        XAR   R4,R5                                                 M8F26170
2C14  9A65           2616        WDR   R6,R5                                                 M8F26180
2C16  9401           2617        EXBR  R0,R1                                                 M8F26190
2C18  9820           2618        WHR   R2,R0            DATA ADDRESS TO DISPLAY.              M8F26200
2C1A  9D60           2619        SSR   R6,R0                                                 M8F26210
2C1C  2081           2620        BTBS  8,1                                                   M8F26220
2C1E  C110 2C0E      2621        BXLE  R1,$PNCH2                                             M8F26230
2C22  41F0 2C2A      2622        BAL   R15,$TAPL        PUNCH TRAILER.                        M8F26240
2C26  4300 2BCE      2623        B     $TAPE            DISPLAY CHECKSUM, HALT PROCESSOR.     M8F26250


2C2A  C800 0100      2625  $TAPL   LHI   R0,256          TO PUNCH BLANK LEADER                 M8F26270
2C2E  2303           2626        BS    $TAPLP                                                M8F26280
2C30  C800 0055      2627  $TAPL1  LHI   R0,85            TO PUNCH 1-FOLD GAP                   M8F26290
2C34  2701           2628  $TAPLP  SIS   R0,1                                                  M8F26300
2C36  032F           2629        BNPR  R15              RETURN                                M8F26310
2C38  2430           2630        LIS   R3,0                                                  M8F26320
```

CHKSUM/M17 PUNCHER

```
2C3A   9A63          2631          WDR    R6,R3          PUNCH BLANK FRAME          MBF26330
2C3C   9D68          2632          SSR    R6,R8                                     MBF26340
2C3E   2081          2633          BTBS   8,1                                       MBF26350
2C40   2206          2634          BS     $TAPLP         CONTINUE.                  MBF26360
                     2635  *                                                        MBF26370
2C42                 2636          END                                             MBF26380
```

CHKSUM/M17 PUNCHER

NO ERRORS 0 SQUEZ PASSES

CAL 04-01

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $CHKSUM | 2BB0 | | | | | | | |
| $DEC1 | 0FF0 | 687 | | | | | | |
| $DEC2 | 0FF6 | 680 | 682 | | | | | |
| $DEC3 | 1008 | 676 | | | | | | |
| $GEN | 2BC0 | 2588 | | | | | | |
| $PNCH1 | 2BF2 | 2608 | | | | | | |
| $PNCH2 | 2C0E | 2621 | | | | | | |
| $PUNCH | 2BDC | | | | | | | |
| $TAPE | 2BCE | 2623 | | | | | | |
| $TAPL | 2C2A | 2602 | 2622 | | | | | |
| $TAPL1 | 2C30 | 2609 | | | | | | |
| $TAPLP | 2C34 | 2626 | 2634 | | | | | |
| ABSTOP | 2C42 | | | | | | | |
| ADC | 0002 | 376 | 672 | 686 | | | | |
| ADR | 0CBC | 1220 | 1221 | | | | | |
| AF | 141C | 949 | | | | | | |
| AMSG | 154E | 190 | | | | | | |
| ASCIDEV | 1506 | 579 | | | | | | |
| ASCIDEV2 | 1518 | 559 | | | | | | |
| ASCILOC | 152C | 593 | 606 | | | | | |
| ASCIPSW | 1522 | 603 | | | | | | |
| ASCISTA | 150E | 569 | 583 | | | | | |
| BOOT | 0088 | 68 | | | | | | |
| BTESTNO | 14D6 | 439 | 448 | 451 | 488 | 1382 | 1699 | |
| C300 | 0A7C | | | | | | | |
| C300ADR | 0A18 | 152 | 699 | 924 | | | | |
| CAR2ND | 14C8 | 154 | 700 | | | | | |
| CARDRV | 1272 | 914 | | | | | | |
| CARENRD | 14C2 | | | | | | | |
| CARRD | 14C0 | 153 | 1168 | | | | | |
| CARRQ2S | 14C5 | 155 | | | | | | |
| CARWRT | 14C1 | 925 | 926 | | | | | |
| CLEAR. | 15DC | | | | | | | |
| CLIFADR | 0A14 | 168 | 861 | 916 | | | | |
| CLIFNRD | 14CC | | | | | | | |
| CLIFRD | 14CA | 169 | 1178 | | | | | |
| CLIFWRT | 14CB | 917 | | | | | | |
| CLR.0 | 2000 | 2272 | | | | | | |
| CLR.1 | 2008 | | | | | | | |
| CLR.2 | 200C | 2317 | | | | | | |
| CLR.MOD | 1FE8 | 1231 | | | | | | |
| CM1.0 | 2050 | 2311 | | | | | | |
| CM1.1 | 2052 | 2305 | 2309 | | | | | |
| CMOD1 | 204E | | | | | | | |
| COMM | 1432 | 1087 | 1096 | 1117 | | | | |
| COMM1 | 143A | 1138 | | | | | | |
| COMRET | 0EC8 | 534 | | | | | | |
| CON2ND | 14BC | 174 | | | | | | |
| CONADR | 14B8 | 172 | 805 | 826 | 884 | 896 | 974 | 1027 |
| CONDRV | 1276 | 920 | | | | | | |

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

| | | |
|---|---|---|
| | | 1412 1416 1418 1419 1421 1423 1425 1427 1429 1431 1433 1439 1441 |
| | | 1450 1452 1455 1472 1473 1481 1495 1504 1511 1514 1524 1550 1552 |
| | | 1554 1556 1566 1580 1589 1606 1620 1623 1628 1631 1653 1654 1658 |
| | | 1665 1667 1671 1682 1697 1698 1816 1819 1820 1825 1831 1833 1949 |
| | | 1956 1962 1968 2044 2048 2050 2104 2109 2116 2120 2124 2128 2131 |
| | | 2267 2271 2272 2419 2423 2425 2426 2428 2432 2490 2499 2508 2515 |
| | | 2523 2580 2582 2586 2588 2591 2592 2595 2595 2596 2603 2603 2605 |
| | | 2608 2612 2614 2617 2621 |
| R10 | 000A | 1031 1031 1032 1047 1121 1121 1483 1507 1520 1569 1581 |
| R11 | 000B | |
| R12 | 000C | 194 205 211 219 336 346 350 354 369 389 625 1490 1501 |
| | | 1503 1510 1518 1523 1526 1534 1537 1540 |
| R13 | 000D | 1576 1590 1597 1604 1911 1914 1942 |
| R14 | 000E | 255 291 334 337 339 387 553 617 619 1079 1097 1099 1115 |
| | | 1124 1128 1130 1484 1496 1508 1521 1530 1548 1573 1591 1599 1637 |
| | | 1675 1701 1712 1716 1720 1724 1801 1910 1943 1955 1957 1967 2068 |
| | | 2090 2105 2107 2114 2189 2222 2275 2337 2483 2514 2555 2557 2560 |
| R15 | 000F | 180 196 242 243 339 345 3 9 353 409 418 421 424 424 |
| | | 426 467 468 470 476 520 620 621 623 627 643 755 1080 |
| | | 1098 1100 1116 1125 1129 1131 1359 1378 1398 1399 1491 1549 1557 |
| | | 1568 1570 1572 1580 1607 1708 1710 1714 1718 1722 1725 1802 1803 |
| | | 1869 1889 1909 1959 1994 2006 2022 2060 2069 2070 2091 2119 2123 |
| | | 2126 2130 2133 2135 2190 2191 2206 2276 2277 2302 2316 2408 2429 |
| | | 2430 2433 2469 2470 2493 2495 2497 2502 2504 2506 2510 2512 2518 |
| | | 2520 2522 2525 2527 2529 2539 2546 2548 2553 2602 2609 2622 2629 |
| R2 | 0002 | 67 71 86 92 127 128 129 130 135 137 154 159 163 |
| | | 170 174 187 188 252 253 257 257 258 260 261 267 270 |
| | | 292 300 302 303 305 326 3 7 363 365 375 417 456 457 |
| | | 465 496 500 501 505 510 515 521 526 534 539 540 559 |
| | | 569 579 583 593 603 606 635 636 638 640 644 659 660 |
| | | 684 685 708 830 834 837 837 932 980 982 982 983 993 |
| | | 995 996 1001 1005 1011 1026 1027 1033 1043 1044 1046 1052 1085 |
| | | 1086 1093 1094 1095 1102 1111 1112 1113 1122 1123 1126 1134 1358 |
| | | 1377 1406 1409 1489 1502 1509 1522 1567 1582 1592 1597 1598 1600 |
| | | 1603 1604 1605 1616 1625 1633 1661 1817 1827 1830 1831 1832 1950 |
| | | 1954 1956 1958 1963 2045 2048 2118 2122 2125 2129 2132 2268 2492 |
| | | 2494 2496 2501 2503 2505 2509 2511 2517 2519 2521 2524 2526 2528 |
| | | 2583 2592 2594 2618 |
| R3 | 0003 | 73 162 163 217 217 222 226 228 230 232 239 241 254 |
| | | 267 292 301 301 306 307 364 365 367 368 371 399 615 |
| | | 628 652 653 654 656 661 670 671 672 674 686 720 722 |
| | | 933 938 942 945 946 949 950 959 960 972 973 979 983 |
| | | 989 993 996 1001 1002 1006 1026 1034 1594 1601 1818 1822 1823 |
| | | 1824 1828 1835 1836 1951 1964 1965 1986 1987 2046 2047 2269 2270 |
| | | 2584 2604 2613 2630 2631 |
| R4 | 0004 | 75 76 77 79 87 89 155 160 164 190 192 197 199 |
| | | 200 202 207 208 221 222 224 232 233 235 258 263 268 |
| | | 269 272 275 280 282 283 283 285 286 287 288 303 309 |
| | | 320 322 335 397 410 411 432 615 616 618 621 639 640 |
| | | 641 642 642 655 656 657 658 658 659 673 673 678 679 |
| | | 681 683 683 684 716 716 717 718 719 726 728 732 737 |
| | | 739 750 786 796 797 800 808 809 888 891 947 948 952 |
| | | 958 969 970 971 995 998 998 1007 1011 1485 1500 1517 1525 |
| | | 1569 1570 1593 1595 1596 1599 1602 1603 1829 1833 1952 1953 2585 |

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

CHKSUM/M17 PUNCHER

| | | | |
|---|---|---|---|
| XIERR | 13FA | 1051 | 1057 |
| XIEXIT | 13F8 | 1058 | |
| ZERO1 | 128A | 936 | |
| ZERO2 | 129A | 940 | |
| ZERO3 | 12AA | 944 | |
| ZERONE | 0CB4 | 1223 | 1226 |