

# MSM DISC TEST (16 AND 32 BIT)

**Consists of:**

<b>Bootstrap Object Tape</b>	<b>06-200F01M17R01</b>
<b>Program Listing</b>	<b>06-200F01M96R01A13</b>
<b>Test Program Description</b>	<b>06-200M95R02A15</b>
<b>Bootstrap Object Tape</b>	<b>06-200F02M17R01</b>
<b>Program Listing</b>	<b>06-200F02M91R01A13</b>
<b>16 Bit Patch Information (R02)</b>	<b>Sheet i</b>
<b>32 Bit Patch Information (R02)</b>	<b>Sheet ii</b>

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R02 PATCH INFORMATION

16 Bit Patch Information

To incorporate these patches, the following changes must be made to make room below the I/O buffers.

LOC	CONTENTS	CHANGE TO
1C66	3F00	4000
196A	4350	4450
196C	3F00	4000

Patch as follows:

LOC	CONTENTS	CHANGE TO
339C	C8C0 0013	4300 33AA BX '33AA'
3B50	4B10 196E	4300 3F00 B PATCH
3F00	XXXX XXXX	4B10 196E SA R1, SA
3F04	XXXX XXXX	4800 1930 LH R0, STATE
3F08	XXXX XXXX	9D00 SSR R0, R0
3F0A	XXXX XXXX	2172 BTFS 7,2
3F0C	XXXX XXXX	2712 SIS R1,2
3F0E	XXXX XXXX	4300 3B54 RETURN
33AA	41E0 3818	4300 3F12 B PATCH
3E12	XXXX XXXX	4800 1922 LH R0, RDER
3E16	XXXX XXXX	2133 BZS * +6
3E18	XXXX XXXX	41E0 3818 BAL R14,SLCHK
3E1C	XXXX XXXX	4300 33AE RETURN
0D38	9D10	0200 NOPR

These patches are incorporated in object 06-200F01R01.1 on Multi-Media packages.

### 32 Bit Patch Information

To incorporate these patches, the following changes must be made to make room below the I/O buffers.

LOC	CONTENTS	CHANGE TO
1C2A	3F60	4060
190E	43B0	411B0
1912	3F60	4060

Patch as follows:

LOC.	CONTAINS	CHANGE TO
1F52	58B1 0000	4300 3F60 B PATCH
3F60	XXXX XXXX	F310 FFF00000 TI R1, MASK
66	XXXX XXXX	4230 1F70 BNZFOUNDTOP
6A	XXXX XXXX	58B1 0000 LDA R11 0(R1)
6E	XXXX XXXX	4300 1F56 BX'1F56'
33C2	C8C0 0013	4300 33D0 B X '33D0'
3B90	5B10 1914	4300 3F72 B PATCH
3F72	XXXX XXXX	5B10 1914 SA R1, SA
76	XXXX XXXX	4800 18C6 LH R0, STATE
7A	XXXX XXXX	9D00 SSR R0, R0
7C	XXXX XXXX	2172 BTFS 7.2
7E	XXXX XXXX	2712 SIS R12
80	XXXX XXXX	4300 3B94 RETURN
33D0	41E0 3846	4300 3F84 B PATCH
3F84	XXXX XXXX	4800 18B8 LH R0, RDER
8	XXXX XXXX	2133 BZS*+6
A	XXXX XXXX	41E0 3846 BAL R14, SLCHK
E	XXXX XXXX	4300 33D4 RETURN
0D22	9D10	0200 NOPR

These patches are incorporated in object 06-200F02R01.1 on multi-media packages.

April, 1978

## MASS STORAGE MODULE (MSM) DISC TEST

## 1. RELATED DOCUMENTS

Test Program Listing	(16-Bit)	06-200F01M96R01A13
	(32-Bit)	06-200F02M91R01A13
Test Program Paper Tape	(16-Bit)	06-200F01M17R01
	(32 Bit)	06-200F02M17R01
MSM Disc Programming Manual		29-518

## 2. RELATED TEST PROGRAMS

For 16-Bit Processors, the following test programs or their equivalents are to be run prior to loading this test:

Memory Test	06-003
Processor Test	06-106
SELCH Test	06-129

For 32-Bit Processors, the following test programs are to be run prior to loading this test.

Series 32 Memory Test	06-156
Series 32 Processor Test Part 1	06-154
Series 32 Processor Test Part 2	06-155
Series 32 Processor Test Part 3	06-178
ESELCH TEST	06-161

## 3. OTHER TEST PROGRAMS

The following test programs are also applicable:

Common Teletype Basic Confidence Test	06-004
Common Current Loop Interface Test	06-184
Common Carousel 300 Test	06-183
Common CRT Test	06-146
Common Line Printer Test	06-170

#### 4. PURPOSE OF TEST

The Mass Storage Module (MSM) Disc Test provides a comprehensive test of the features of all components of INTERDATA MSM Disc Systems. Format Mode testing, Seek Interrupt queuing from multiple files, and multiple file data transfers may be tested.

#### NOTE

This test program presumes that the Disc Pack used has been formatted. To format an MSM Disc Pack, refer to the Common Mass Storage Module Disc Formatter Program Description, Publication Number 06-201M95A15. The MSM Disc Test can destroy the format of the Disc Pack used.

Prior to performing this test, the user should be familiar with the contents of the INTERDATA Mass Storage Module Disc Programming Manual, Publication Number 29-518.

#### 5. TEST SEQUENCE

##### Test 00

The status of the Selector Channel, Disc Controller, and Disc Drive is checked. An uncorrectable error causes an error message to be printed, and the test is aborted. Test 00 is executed whenever the RUN command is entered, and cannot be bypassed.

##### Test 01

A simple test of the Seek and Restore operations is performed. A Seek is made to the maximum valid cylinder address, followed by a Restore to Cylinder 0. The sequence is repeated for each valid cylinder address bit. The Seek Incomplete status bit and Servo Offsets are then tested.

##### Test 02

Oscillating Seek Test. Performs an exhaustive check of the head-positioning servo.

##### Test 03

Random Seek Test. Designed to detect problems not found by the preceding tests.

##### Test 04

Interrupt Seek Test. Performs a simple check of Seek Interrupt logic, by Seeking to a distant cylinder, the current cylinder, and an invalid cylinder. Also tests Restore interrupt, and Servo Offset interrupts.

Test 05

Format Mode Test. The following errors are synthesized and tested:

- A. Header Comparison failure
- B. Defective Sector status
- C. Longitudinal Redundancy Check error
- D. Write Protect violation

Test 06

Multi-Sector Test. Checks multi-sector data transfer, head switching, Cylinder Overflow logic, and Head Select Error.

Test 07

Interrupt Data Test. Checks Data Transfer Interrupt logic, and Selector Channel/Disc Controller Interrupt sequencing.

Test 08

Spiral Data Test. Checks Read and Write logic with all possible data patterns. The number of consecutive sectors in each transfer is variable from 1 to a full track, if adequate memory is available.

Test 09

Worst-Case Data Test. Checks Read and Write logic with a selectable worst-case data pattern. The number of consecutive sectors in each transfer is variable from 1 to a full track, if adequate memory is available.

Test 0A

Random Data Test. Checks Read and Write logic with a random data pattern. The number of consecutive sectors in each transfer is variable from 1 to a full track, if adequate memory is available.

Test 0B

Manual Intervention Test (requires operator response). Performs testing which requires manual intervention.

Test 0C

Multi-Disc Test (requires two MSM Drives of the same type on the same controller). Performs the following checks:

- A. Overlapping Seek operations.
- B. Seek Interrupt queuing.
- C. Multiple-Sector data transfer between Drives.

Test 0D

Scope Loop Test. Reads and writes a selectable data pattern in Normal Mode. The number of consecutive sectors transferred is variable from 1 to 2.

Test 0E

Scope Loop Test. Reads and writes a selectable data pattern in Format Mode. The number of consecutive sectors transferred is variable from 1 to 2.

Test 0F

Scope Loop Test. Reads and writes a selectable sector with the Defective Sector bit in the Sector header.

Test 10

Scope Loop Test. Reads and writes a selectable sector with an incorrect Head Address in the sector header.

Test 11

Scope Loop Test. Reads and writes a selectable sector with an incorrect Cylinder Address in the sector header.

Test 12

Scope Loop Test. Reads and writes a selectable sector with an incorrect Normal Mode Longitudinal Redundancy Check word.

Test 13

Scope Loop Test. Performs a Read Check operation on a selectable sector.

Test 14

Scope Loop Test. Seeks to a selectable cylinder, or between selectable cylinders.

Test 15

Read-Only Test. Reads a selectable area of the disc and performs error checking, in Normal Mode.



Test 16

Scope Loop Test. Tests Head Offset and Data Strobe Offset Read operation, in Normal Mode.

Test 17

Reformat Test. Restores proper format on a selectable track. Sectors with errors are flagged as defective; the flag is tested.

Test 18

Rotational Position Sense Test. Tests the RPS values returned after reading each sector on a selectable track. Also provides a scope loop feature.

Test 19

Off-Line Format Test. Verifies proper operation of the Controller Read Format Off-Line and Write Format Off-Line features, and sector alternation

Test 1A

Defective Sector Alternation Test. Tests Defect-Free, Alternated, and Defective-Flagged alternated sectors on a selectable track.

Test 1B

Scope Loop Test. Erases the Address Mark for a selectable sector, then attempts to read the sector.

Test 1C

Scope Loop Test. Reads and Writes a selectable track in the Format Off-Line mode.

6. 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
2. Minimum Memory: 20K Bytes
3. Selector Channel (SELCH, ESELCH, or BSELCH)
4. Mass Storage Module (MSM) Disc Controller, Drive, and Pack (Controller boards 35-626R06 and above, and 35-627M01R03)
5. Console Input Device (refer to Appendix 1):  
Teletype, CRT, or Carousel 15/30/35/300
6. List Device (refer to Appendix 1):  
Teletype, CRT, Carousel 15/30/35/300, or Line Printer

## 7. REQUIREMENTS OF MACHINE UNDER TEST

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

### Device Addresses

The MSM 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.

The MSM Drive is assumed to be strapped for device addresses from X'FC' - X'FF', for Drives 0-3, respectively. This address is trapped by the MSM Controller, and is not specifically entered by any option. To select the desired Drive, the DRIVE option must be entered. Refer to Appendices 2 and 3.

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

## 8. LOADING PROCEDURES

### 8.1 Test Tape Format

The 06-200M17R01 Tapes are Absolute, non-zoned Memory Image Tapes with Front-End Boot Loaders. Each test occupies approximately 20KB of memory.

### 8.2 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 the F01 (16-Bit) or F02 (32-Bit) Test Program Tape in the Paper Tape Reader.
3. Execute at address X'30'.

### 8.3 Multi-Media Diagnostic Loading Procedure

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

### 8.4 Program Execution

1. Refer to Appendix 1 and set up the addresses for the Console Input Device and List Device.
2. For a 16-Bit Processor, address location X'A04'. Start program execution, and note that the following is output to the Console Device:

```
MSM DISC TEST 06-200F01R01 (16-BIT)
```

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

```
MSM DISC TEST 06-200F02R01 (32-BIT)
```

## 9. OPERATING PROCEDURES

### 9.1 Normal Testing

After the Test Program is loaded, the correct values for the TIMVAL, DRIVE, LOCYL, HICYL, and XFILE options must be entered. If the default value for any other option is not the desired value, the correct value must be entered. (Refer to Appendices 2 and 3).

When the RUN command is entered, the Option Table is tested for validity. If an invalid option value is detected, (e.g., invalid HICYL option for the type of MSM Drive under test), an error advisory is printed (see Appendix 5), and control is returned to the Command Processor. For example:

```
*RUN
INVALID HICYL OPTION
*
```

The user should refer to Appendix 3 for the valid option entry, correct the error and again enter the RUN command. If all option entries are correct, Test 0 is selected and run. When Test 0 terminates, all other selected tests are run, and control is returned to the Command Processor.

The default testing sequence includes Tests 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, 15, 18, and 19. When these tests have been executed successfully, refer to Additional Testing, below.

If the message

```
SELECT NEW SECTOR OPTION
```

is displayed, enter a different LOCYL or SECTOR option (see Appendix 3), then select and run the indicated test again with the newly-selected track.

## 9.2 Additional Testing

The tests listed in this section do not lend themselves to the default mode of testing, but must be run successfully (where applicable) before testing is complete.

9.2.1 Manual Intervention Test. ( Test B ). Select Test B and enter the RUN Command. Follow the directions displayed on the Console Device as testing proceeds. For example, when the message

TAKE DRIVE OFF-LINE

is displayed, depress the START switch on the Drive's Switch Panel, to turn off the lamp. Refer to Appendix 5 for messages displayed.

9.2.2 Multi-Disc Test (Test C). If two or more Disc Drives of the same type are attached to the Controller, select the desired Secondary file by entering the XFILE option. Enter the appropriate LOCYL and SECTOR options to avoid destruction of data on the packs mounted on the Drives specified by the DRIVE and XFILE Options, and enter the RUN command. The Multi-Disc Test simulates an actual operating environment, testing interrupt sequencing and data transfers. When used in conjunction with the LOOP option, this test provides an extensive Multi-Disc exerciser.

9.2.3 Scope Loop Tests. Select and run tests D, E, F, 10, 11, 12 13, 14 and 16 for repetitive testing of:

- A. Data Transfers in Normal and Format Modes
- B. Sector Match and Redundancy Check Logic
- C. Seek/Restore Logic
- D. Servo Offset/Data Strobe Offset Logic

Refer to the Test Program listing for the options applicable to each test.

9.2.4 Read-Only Test. Select and run Test 15 for quick check of Normal-Mode Disc operation. Each sector between the limits specified by the LOCYL and HICYL options (inclusively) is read, with error checking. Data on the Disc is not destroyed. When used in conjunction with Test 4 (Interrupt Seek) and Test 7 (Interrupt Data), a brief non-destructive confidence test of the drive is performed.

9.2.5 Re-Format Test (Test 17). Any test writing to the disc in format mode causes an automatic reformat of the track, on completion of the test. In the event that the re-format is aborted, or if it is desired to establish format on a track, Test 17 must be run. For example, if the automatic re-format is aborted after running Test E:

```
* TEST E
* RUN
TEST OE
ATTEMPTING RE-FORMAT
ERROR 0E5021
RE-FORMAT ABORTED
END OF TEST
```

```
RE-FORMAT LOCYL
*
```

The track may then be re-formatted by the following command sequence:

```
* TEST 17
* RUN
```

### 9.3 Modification of Options

The Option Table (see Appendix 3) provides a means for the user to tailor the test sequence as necessary. The option values may be set in different combinations, to test additional functions or to place emphasis on a particular test sequence. The following modifications are recommended as part of the test sequence for the MSM Disc System.

**DRIVE.** If more than one Drive is attached to the Controller, repeat all test sequences for each valid DRIVE option, to verify the operation of each Drive in the Disc System.

**LOCYL.** This option determines the lower Cylinder Address limit for most of the test sequences. Those data transfer test transferring 64 sectors of data or less, use the cylinder specified by the LOCYL option. Since the recording density compensation varies as the cylinder address increases, the LOCYL option should be varied through several steps from zero through maximum, and the tests repeated for each LOCYL option entered.

**HICYL.** This option determines the upper Cylinder Address limit for most of the test sequences. Modify this option in conjunction with the LOCYL option, to further test data transfer option and seek logic sequencing.

**RETRY.** This option determines the maximum number of errors allowed before the current test is aborted. Increase this value to prevent aborting the test.

**SECNUM.** This option specifies how many sectors are transferred at a time, in the Data Tests. Modify this option to isolate a fault in multi-sector data transfers.

XFILE. This option specifies the secondary file used in the Multi-Disc Test. Vary this option in conjunction with the DRIVE option to test all combinations of primary and secondary files.

DATA. This option specifies the worst-case data halfword used for data transfers. Modify this option if a Data Recovery or Bus problem is suspected.

INBUF, OUTBUF. These options determine whether the program default buffers, or the user-specified buffers are used for data transfers. The options should be modified to test extended memory data transfers (32-bit machines). Often, faults may be isolated with the buffers located at 16KB or 64KB boundaries.

SECTOR. This option, in conjunction with the LOCYL option, determines where single-sector data transfers will be made, on the disc. Because the timing is different for data transfers for each sector in any given track, the SECTOR option should be varied in conjunction with the LOCYL and DATA options to verify proper operation over the valid range.

OTHER OPTIONS. The LOOP, CONTIN, SCOPE, OFFSET, BUFSIZ, and SEEK options allow the user to run the selected tests a specified number of times, or continuously; and to tailor the Scope Loop Tests as needed. For a description of option usage in the Scope Loop Tests, refer to the program listing.

## 10. ERROR PROCEDURES

### 10.1 Recoverable Errors

If an error is detected which is considered recoverable, an error message is displayed on the List Device. For example:

```
ALTERNATE CHANNEL BUSY
```

The program then attempts to recover from the error. If the error is not corrected, another error message is displayed. This sequence continues until the error is corrected, or the RETRY count is exhausted. In the latter case, the following message is displayed:

```
SOLID ERROR:  
TEST nn ABORTED
```

where nn is the test number. The next selected test is then executed.

### 10.2 Irrecoverable Errors

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

```
ERROR TTF3  
PSW PPPP LOC LLLL
```

Where:

TT is the number of the test in which the error was detected  
F3 is the code for Machine Malfunction  
PPPP is the least significant 16 bits of the PSW status when  
the error was detected  
LLLL is the least significant 16 bits of the PSW location  
counter when the error was detected.

Control is then returned to the Command Processor, and the program  
waits for console input.

In the case of irrecoverable errors other than Machine Malfunction  
Interrupt, the following message is immediately printed, and con-  
trol is then returned to the Command Processor:

```
ERROR TTFN  
PSW PPPP LOC LLLL
```

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

#### 11. OVERNIGHT TESTING

To run the selected tests for an extended period of time, enter  
'RUN' and take the Console Device Off-Line. Testing continues  
until the Console Device is put back On-Line, at which time the  
number of times the test sequence was executed, and the number of  
errors detected, are printed:

```
TOTAL TOTERR  
XXXX YYY
```

The Manual Intervention Test (Test B) cannot be run in this mode.  
Those tests which destroy format may be selected and run in this  
mode, as part of a string including tests which expect proper format.  
However, in the event that the automatic re-format is aborted, testing  
is terminated.

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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:

IO	<div style="display: flex; justify-content: space-between; width: 100%;"> <span>0</span> <span>7 8</span> <span>15</span> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Console Device Identifier</td> <td style="width: 50%; padding: 5px;">List Device Identifier</td> </tr> </table> </div>	Console Device Identifier	List Device Identifier
Console Device Identifier	List Device Identifier		

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 input. Any option may be entered from the Console Input Device, followed by a space and the desired hexadecimal value; an exception is the TEST option, which accepts arguments separated by commas. A carriage return (CR) is entered 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  
OPTION TABLE

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.

NOTES

1. Test 0 is run prior to any test sequence. Test 0 is run once only, regardless of the LOOP option. If CONTIN 1 is specified, however, Test 0 is run once each time the selected string of tests is executed.
2. This test program requires that the disc System Controller consist of boards with the following revision levels, or above:

35-626R06  
35-627M01R03

OPTION	MANDATORY (x)	DEFAULT VALUE	DESCRIPTION
BUFSIZ		0	Selects the number of sectors transferred at one time, in Tests D and E. 0 = 1 sector transfer size 1 = 2 sector transfer size
BYCKAD		0	Determines whether an address check (Read Check) is to be performed following a Seek or Restore operation. 1 = Bypass Address Check 0 = Perform Address Check (Requires Formatted Disc Pack)
CONTIN		0	Enables the user to run all selected tests continuously, until the BREAK key returns the program to Command mode. 0 = Normal Execution 1 = Continuous Execution
DATA		X'B8B8'	Defines the worst-case data pattern read and written.
DISCON		X'00FB'	Defines Disc Controller Address.
DRIVE	X	X'FFFF'	Defines which Drive attached to the Controller is to be used for testing. Set equal to 0, 1, 2, or 3 (See XFILE)

OPTION	MANDATORY (X)	DEFAULT VALUE	DESCRIPTION
HEADS		NONE	<p>Determines which heads are not to be used during execution of the tests. When HEADS 1 is entered, the following message is printed:</p> <pre> ENTER DELETED HEADS &gt; Enter the address(es) of the desired head(s), followed by a carriage return (CR). Example - to delete head addresses 0, 1, and 4: *HEADS 1 (CR) ENTER DELETED HEADS &gt; 0, 1, 4 (CR) </pre> <p>No head address may be greater than the maximum address implied by the PACTYP option.</p> <p>If HEADS 0 is entered, no heads are deleted. (See SECTOR)</p> <p>The HEADS option must not delete the head specified by the Sector option.</p>
HICYL	x	X'FFFF'	<p>Establishes the high cylinder address during the test procedure. HICYL must not be less than the LOCYL option, and must not be greater than the number of cylinders implied by the PACTYP option.</p>

OPTION	MANDATORY (x)	DEFAULT VALUE	DESCRIPTION
INBUF		See Listing	<p>Specifies the Read Buffer start- location in memory. The option value is interpreted as follows:</p> <p>X'nnnn' = 16-Bit absolute starting address for 16-Bit Pro- cessors.</p> <p>X'KKKKK' = 20-Bit absolute starting address for 32-Bit Pro- cessors.</p> <p>If the default value is not used, the buffer address must not lie within the the test program. (See OUTBUF )</p>
INTLEV		0	<p>Defines the interrupt level of the SELCH, Controller, and Disc Drive.</p> <p>n = 0→X'F'</p>
LOCYL	x	X'FFFF'	<p>Establishes the low cylinder address during the test procedure. LOCYL must be less than or equal to the HICYL option, and not greater than the num- ber of cylinders implied by the PACTYP option.</p>
LOOP		0	<p>Determines the number of times a test is executed before advancing to the next selected test. n≤X'7FFF'</p>



OPTION	MANDATORY (X)	DEFAULT VALUE	DESCRIPTION
NOAUTO		0	<p>Inhibits track evaluation before execution of Format-mode tests, and inhibits automatic re-format of the track following execution of such tests. This option should be changed only by the Customer Engineer, as it allows pack certification to be destroyed if not used correctly.</p> <p>0 = Normal Operation  1 = Inhibit Automatic Functions</p> <p>The message  PROCEED WITH CAUTION  is printed each time this option value is changed.</p>

OPTION	MANDATORY (x)	DEFAULT VALUE	DESCRIPTION
NOMSG		0	<p>Determines whether commentary messages are to be printed.</p> <p>0 = All messages printed</p> <p>1 = Error messages only</p> <p>2 = Suppress Level 1 Supplementary information (See App. 5)</p> <p>3 = Suppress Levels 1 &amp; 2 Supplementary information (See App. 5)</p>
OFFSET		34	<p>Controls Servo/Data Strobe offset in Test 16.</p> <p>OFFSET = XXYY, where:</p> <p>if XX = 1, nominal offset is restored after each sequence, and fault cleared</p> <p>if XX = 0, nominal offset is restored and fault is cleared only when Test 16 terminates.</p> <p>YY = the offset Command to be used. (X'30', X'31', X'32', X'34', X'35', X'36', X'38', X'39', and X'3A' are valid.)</p>

OPTION	MANDATORY (x)	DEFAULT VALUE	DESCRIPTION						
OPTION		N/A	Causes all options, with their current values, to be displayed on the Console device.						
OUTBUF		See Listing	Specifies the Write Buffer starting location in memory. The write buffer must not overlap the read buffer. (See INBUF)						
PACTYP		X'CE00'	Identifies the type of Pack, and Drive. For example, type CEXX designates a Customer Engineer pack, where the suffix digits are defined as follows:						
			<table border="1"> <thead> <tr> <th><u>SUFFIX</u></th> <th><u>MEANING</u></th> </tr> </thead> <tbody> <tr> <td>00</td> <td>67 MB MSM Pack Max. Head Address = X'04' Max. Sector Address = X'3F' Max. Cyl. Address = X'336'</td> </tr> <tr> <td>01</td> <td>256 MB MSM Pack Max. Head Address = X'12' Max. Sector Address = X'3F' Max. Cyl. Address = X'336'</td> </tr> </tbody> </table>	<u>SUFFIX</u>	<u>MEANING</u>	00	67 MB MSM Pack Max. Head Address = X'04' Max. Sector Address = X'3F' Max. Cyl. Address = X'336'	01	256 MB MSM Pack Max. Head Address = X'12' Max. Sector Address = X'3F' Max. Cyl. Address = X'336'
<u>SUFFIX</u>	<u>MEANING</u>								
00	67 MB MSM Pack Max. Head Address = X'04' Max. Sector Address = X'3F' Max. Cyl. Address = X'336'								
01	256 MB MSM Pack Max. Head Address = X'12' Max. Sector Address = X'3F' Max. Cyl. Address = X'336'								
			<u>Type 00XX designates a User Pack.</u>						
RETRY		1	Specifies the number of retries allowed following an error before the test is aborted.  n = 0→X'7FFF'.						
RUN	x	N/A	Causes the selected tests to be run, according to the options specified.						

OPTION	MANDATORY (x)	DEFAULT VALUE	DESCRIPTION
SCOPE		0	<p>Used in SCOPE LOOP TESTS D,E,F.10,11,12, 16, and 1B.</p> <p>0 = Write - Read</p> <p>1 = Read Only</p> <p>2 = Write Only</p> <p>3 = Write-Read-Check Data</p>
SECNUM		3	<p>Specifies (the number of sectors -1) per transfer in Tests 8,9,A,C,15,16.</p> <p>n = 0,1,3,7,X'F',X'1F', or X'3F'.</p> <p>Memory required for each I/O buffer is (SECNUM + 1) times X'100'. For Test 15, n = X'7F',X'FF',X'1FF', and X'3FF' are also valid; in this case, OUTBUF may be in non-existent memory. (See INBUF, OUTBUF.)</p>
SECTOR		0	<p>Selects the Head and Sector addresses used in tests transferring no more than 1 track of data. SECTOR = hhkk, where hh = the head address.</p> <p>kk = the address of the first sector.</p> <p>The addresses used must not be greater than the maximum addresses implied by the PACTYP option. The head address must not be the same as a head deleted by the HEADS option.</p>

OPTION	MANDATORY (x)	DEFAULT VALUE	DESCRIPTION																														
SEEK		0	Used in SEEK SCOPE LOOP TEST (Test E). 0 = Seek LOCYL, Restore 1 = Seek LOCYL, seek HICYL																														
SELCH		X'00F0'	Defines Selector Channel Address																														
TEST		0,1,2,3, 4,5,6,7, 8,9,A,15, 18, 19	Selects the test(s) to be executed when the RUN command is entered. Test 0 is <u>always</u> selected.																														
TIMVAL	x	0	Establishes a count value for 1-milli- second software time-out.																														
			<table border="1"> <thead> <tr> <th><u>PROCESSOR</u></th> <th><u>VALUE</u></th> </tr> </thead> <tbody> <tr> <td>6/16 MOS</td> <td>14A</td> </tr> <tr> <td>6/16 (750nsec Memory)</td> <td>14D</td> </tr> <tr> <td>6/16 (1000nsec Memory)</td> <td>134</td> </tr> <tr> <td>7/16 Basic</td> <td>D2</td> </tr> <tr> <td>7/16 HSALU</td> <td></td> </tr> <tr> <td>(750nsec memory)</td> <td>14D</td> </tr> <tr> <td>(1000nsec memory)</td> <td>134</td> </tr> <tr> <td>7/32</td> <td></td> </tr> <tr> <td>(750nsec memory)</td> <td>EB</td> </tr> <tr> <td>(1000nsec memory)</td> <td>D2</td> </tr> <tr> <td>8/16, 8/16E</td> <td></td> </tr> <tr> <td>(750ns Memory)</td> <td>14D</td> </tr> <tr> <td>(1000ns Memory)</td> <td>134</td> </tr> <tr> <td>8/32</td> <td>DA</td> </tr> </tbody> </table>	<u>PROCESSOR</u>	<u>VALUE</u>	6/16 MOS	14A	6/16 (750nsec Memory)	14D	6/16 (1000nsec Memory)	134	7/16 Basic	D2	7/16 HSALU		(750nsec memory)	14D	(1000nsec memory)	134	7/32		(750nsec memory)	EB	(1000nsec memory)	D2	8/16, 8/16E		(750ns Memory)	14D	(1000ns Memory)	134	8/32	DA
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OPTION	MANDATORY (x)	DEFAULT VALUE	DESCRIPTION
XFILE	x	X'FFFF'	Defines which Drive attached to the Controller is to be used as the secondary file, for Disc-to-Disc data transfers in Test OC. XFILE must not reference the same drive as the DRIVE option.

APPENDIX 4

EXPECTED PRINTOUT

MSM DISC TEST 06-200F02R01 (32-BIT)

\* OPTION

INBUF KKKKKK

OUTBUF KKKKKK

HEADS

TEST 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, 15, 18, 19 (Default Tests)

LOCYL           FFFF  
HICYL           FFFF  
SECTOR          0000  
PACTYP          CE00  
BYCKAD          0000  
SELCH           00F0  
DISCON          00FB  
DRIVE           FFFF  
XFILE           FFFF  
RETRY           0001  
TIMVAL          0000  
DATA            B8B8  
SCOPE           0000  
OFFSET          0034  
BUFSIZ          0000  
SECNUM          0003  
SEEK            0000  
LOOP            0000  
CONTIN          0000  
NOMSG           0000  
INTLEV          0000

\* TIMVAL    DA                           (For Model 8/32)

\* DRIVE     0

\* LOCYL     0

\* HICYL     7

\* RUN

NOTE

If more than one Drive is attached to the Controller,  
repeat the test for each DRIVE Option.

TEST 00	Status Test
NO ERROR	
TEST 01	Seek Restore Test
NO ERROR	
TEST 02	Oscillating Seek Test
NO ERROR	
TEST 03	Random Seek Test
NO ERROR	
TEST 04	Interrupt Seek Test
NO ERROR	
TEST 05	Format-Mode Test
ATTEMPTING RE-FORMAT	
NO ERROR	

TEST 09 (Worst-Case Data Test)  
NO ERROR  
TEST 0A (Random Data Test)  
NO ERROR  
TEST 15 (Read-Only Test)  
NO ERROR  
TEST 18 (Rotational Position Sense Test)  
NO ERROR  
TEST 19 (Off-Line Format Test)  
ATTEMPTING RE-FORMAT  
NO ERROR  
END OF TEST  
\* TEST B  
\* RUN

TEST 00  
NO ERROR  
TEST 0B (Manual Intervention Test)  
TAKE DRIVE OFF-LINE  
PUT DRIVE ON-LINE  
SET WRITE-PROTECT ON  
SET WRITE-PROTECT OFF  
NO ERROR  
END OF TEST

\* XFILE 1 (If two or more Drives on Controller. Repeat  
\* TEST C with all combinations of DRIVE and XFILE).  
\* RUN

TEST 00  
NO ERROR  
TEST 0C (Multi-Disc Test)  
NO ERROR  
END OF TEST



```
* INBUF 10000          (or Top-of-Memory, less X'500'.)
* TEST 6, 7, 8, 9, A
* RUN
```

```
TEST 00
NO ERROR
```

```
·
·
```

```
TEST 0A
NO ERROR
END OF TEST
*
```

```
* TEST 4, 7, 15
* CONTIN 1
* RUN
```

```
TEST 00
NO ERROR
TEST 04          (Interrupt Seek Test)
NO ERROR
TEST 07          (Interrupt Data Test)
NO ERROR
TEST 15          (Read-Only Test)
NO ERROR
```

```
·
·
```

```
TEST 15
NO ERROR
(User Depresses BREAK Key)
* CONTIN 0
```

The sequence above represents basic testing of the MSM Disc System. For further testing, run the above tests, changing the LOOP, CONTIN, LOCYL, HICYL, PACTYP, DRIVE, XFILE, INBUF, OUTBUF, DATA, and HEADS options, as applicable.

In addition, Tests D, E, F, 10, 11, 12, 13, 14, 16, 17, 1A, 1B, and 1C should be run, varying the above options, as applicable. Further options related to these tests include BUFSIZ, SECTOR, SEEK, SCOPE and OFFSET. For this series of tests, the LOCYL, HICYL, and SECTOR options should encompass an error-free area on the Disc.



## APPENDIX 5

The following tables are designed to explain all error printouts, as well as the options used by each test. In the following tables the term "Global", in the "Options Used" column is used to indicate the following options, which are applicable to all of the tests:

LOOP, CONTIN	INBUF
TEST	OUTBUF
DRIVE	
SELCH	
DISCON	
RETRY	
TIMVAL	
PACTYP	

### NOTES

1. On Multi-sector transfers the head (HH) and sector (KK) fields indicate the exact sector in error.
2. All numbers displayed in error printouts are hexadecimal.
3. If any test is run which writes to the disc in Format Mode, the track selected by the LOCYL and SECTOR options MUST be reformatted, to protect the integrity of the address-Mark Sectoring. The test program attempts to perform this function automatically. If the re-format is aborted for some reason, a manual re-format must be performed. This is accomplished by Selecting Test 17, and entering 'RUN'. The message 'RE-FORMAT LOCYL' is displayed whenever manual intervention is required.

## Error Message Format Table

### Error Message Format

### Interpretation

#### Irrecoverable Errors

ERROR TTFN  
 DEV DDD STA SS  
 PSW PPPP LOC LLLL

OR

ERROR TTFN  
 PSW PPPP LOC LLLL

TT = Test Number  
 TTF1 = Arithmetic Fault Interrupt  
 TTF2 = Illegal Instruction Interrupt  
 TTF3 = Machine Malfunction Interrupt  
 TTF4 = Unexpected Device Interrupt  
 TTF5 = 32 Bit Relocation/Protect  
 Interrupt  
 16 Bit Floating Point Div.  
 Interrupt  
 TTF6 = External Interrupt into the  
 wrong interrupt level. (See  
 INTLEV option in Appendix 3.)  
 DDD = Device Address returned when the  
 interrupt occurred.  
 SS = Status of the interrupt device  
 PPPP = Least significant 16 bits of  
 PSW Status when interrupt  
 occurred.  
 LLLL = Least significant 16 bits of PSW  
 Location Counter when interrupt  
 occurred.

#### Recoverable Errors - Type 1 (Status Error)

ERROR TTCCNN  
 LOC LLLL  
 DEV DDD STA SS  
 SHOULD BE SX  
 STATUS S1 S2 S3 S4 S5 S6  
 CYL CCC HEAD HH SECT KK

TT = Subtest Number  
 CC = Operation Attempted  
 NN = Error Detected  
 LLLL = Location when Error Detected  
 DDD = Device Producing the Error  
 SS = Status of Device Producing Error  
 SX = Expected Status  
 S1 = Selector Channel Status  
 S2 = Disc Controller Status  
 S3 = Drive 0 Status  
 S4 = Drive 1 Status  
 S5 = Drive 2 Status  
 S6 = Drive 3 Status  
 CCC = Current Cylinder Address  
 HH = Starting Head Address  
 KK = Starting Sector Address

#### Recoverable Errors - Type 2 (Timeout Error)

ERROR TTCCNN  
 LOC LLLL  
 DEV DDD STA SS  
 STATUS S1 S2 S3 S4 S5 S6  
 CYL CCC HEAD HH SECT KK

TT = Subtest Number  
 CC = Operation Attempted  
 NN = Error Detected  
 LLLL = Location when Error Detected  
 DDD = Device Producing the Error  
 SS = Status of Device Producing the  
 Error  
 S1 = Selector Channel Status

S2 = Disc Controller Status  
 S3 = Drive 0 Status  
 S4 = Drive 1 Status  
 S5 = Drive 2 Status  
 S6 = Drive 3 Status  
 CCC = Current Cylinder Address  
 HH = Starting Head Address  
 KK = Starting Sector Address

---

Recoverable Errors - Type 3 (SELCH Final Address Error)

ERROR TTCCNN  
 LOC LLLL  
 DEV DDD STA SS  
 SHOULD BE SX  
 STATUS S1 S2 S3 S4 S5 S6  
 CYL CCC HEAD HH SECT KK  
 SELCH FA AAAA  
 SHOULD BE BBBB

TT = Subtest Number  
 CC = Operation Attempted  
 NN = Error Detected  
 LLLL = Location when Error Detected  
 DDD = Selector Channel Address  
 SS = Selector Channel Status  
 SX = Expected Selector Channel Status  
 S1 = Selector Channel Status  
 S2 = Disc Controller Status  
 S3 = Drive 0 Status  
 S4 = Drive 1 Status  
 S5 = Drive 2 Status  
 S6 = Drive 3 Status  
 CCC = Current Cylinder Address  
 HH = Head Address when Error Detected  
 KK = Sector Address when Error Detected  
 AAAA = Selector Channel Final Address Read  
 BBBB = Selector Channel Final Address Expected

---

Recoverable Errors - Type 4 (Data Compare Error)

ERROR TTCCNN  
 LOC LLLL  
 DEV DDD STA SS  
 STATUS S1 S2 S3 S4 S5 S6  
 CYL CCC HEAD HH SECT KK  
 BYTES NNNN READ AAAA  
 SHOULD BE BBBB

TT = Subtest Number  
 CC = Operation Attempted  
 NN = Error Detected  
 LLLL = Location when Error Detected  
 DDD = Associated Disc Drive Address  
 SS = Associated Disc Drive Status  
 S1 = Selector Channel Status  
 S2 = Disc Controller Status  
 S3 = Drive 0 Status  
 S4 = Drive 1 Status  
 S5 = Drive 2 Status  
 S6 = Drive 3 Status  
 CCC = Current Cylinder Address  
 HH = Head Address when Error Detected  
 KK = Sector Address when Error Detected  
 NNNN = Byte Count when Error Detected  
 AAAA = Data Bytes Read  
 BBBB = Data Expected to be Read

---

Recoverable Errors - Type 5 (Drive RPS Count Failure)

ERROR TTCCNN	TT	=	Subtest Number
LOC LLLL	CC	=	Operation Attempted
DEV DDD STA SS	NN	=	Error Detected
SHOULD BE SX	LLLL	=	Location when Error Detected
STATUS S1 S2 S3 S4 S5 S6	DDD	=	Associated Disc Drive Address
RPS RR	SS	=	Associated Disc Drive Status
SHOULD BE RX	SX	=	Expected Associated Disc Drive Status
	S1	=	Selector Channel Status
	S2	=	Disc Controller Status
	S3	=	Drive 0 Status
	S4	=	Drive 1 Status
	S5	=	Drive 2 Status
	S6	=	Drive 3 Status
	RR	=	RPS Count Read
	RX	=	RPS Count Expected

---

Recoverable Errors - Type 6 (Background Testing Failure)

ERROR TTCCNN	TT	=	Subtest Number
LOC LLLL	CC	=	Operation Attempted
BACKGROUND FAILURE	NN	=	Error Detected
	LLLL	=	Location when Error Detected

---

ERROR CODE CCINTERPRETATION

00	Testing Initial Status
10	SET CYLINDER to Drive
11	SET HEAD to Drive
12	CLEAR FAULT to Drive
13	RELEASE to Drive
20	SEEK (Valid Cylinder Address)
21	SEEK (Invalid Cylinder Address)
30	RESTORE
31	RESTORE FOLLOWING SEEK INCOMPLETE
40	OFFSETS: Servo Nominal, Strobe Nominal
41	Servo Nominal, Strobe Late
42	Servo Nominal, Strobe Early
44	Servo Minus, Strobe Nominal
45	Servo Minus, Strobe Late
46	Servo Minus, Strobe Early
48	Servo Plus, Strobe Nominal
49	Servo Plus, Strobe Late
4A	Servo Plus, Strobe Early
50	READ - CHECK

ERROR CODE CC

INTERPRETATION

60	(ANY) WRITE
61	WRITE FORMAT
62	WRITE FORMAT OFF - LINE
63	WRITE WITH PROTECTION
64	ERASE ADDRESS MARK
70	(ANY) READ
71	READ FORMAT
72	READ FORMAT OFF - LINE
80	DATA TEST
90	TESTING REQUIRED ERROR STATUS FROM CONTROLLER
91	WRITE - PROTECT VIOLATION
92	HEADER FAIL
93	DEFECTIVE SECTOR
94	CYLINDER OVERFLOW
95	DATA TRANSFER ERROR



ERROR CODE CC

INTERPRETATION

A0	TESTING REQUIRED ERROR STATUS FROM DRIVE
A1	WRITE - PROTECT
A2	ALTERNATE CHANNEL BUSY
A3	DRIVE UNSAFE
A4	DRIVE NOT READY
A5	SEEK INCOMPLETE
A6	DRIVE OFF - LINE
B0	TESTING DRIVE ROTATIONAL POSITION SENSE CIRCUIT

<u>ERROR CODE NN</u>	<u>INTERPRETATION</u>
01	Status Error from Interrupting Device
02	Expected Error Status not produced by Interrupting Device
11	Selector Channel Status Error
12	Expected Error Status not produced by Selector Channel
21	Disc Controller Status Error
22	Expected Error Status not produced by Disc Controller
31	Status Error from Currently - Selected Drive
32	Expected Error Status not produced by Current Drive
40	Time-out
50	Not used
60	Selector Channel Final Address Error
70	Data Compare Error
81	Rotational Position Sense Error
91	Background Testing Failure

## APPENDIX 5 (Continued)

Fault Isolation Table

Fault Identification	Recommended Troubleshooting Procedure	Related Options
Initial Status of Controller and/or SELCH and disc drive in error	Ensure that SELCH and controller addresses are correct and all interfaces are properly seated. Repeat Test 0.	DISCON SELCH DRIVE XFILE
Disc Seek Operational failure	Refer to Test 14 which provides Seek/Restore Scope Loop capability. Run with SEEK option = 1 which results in alternate Seek operations to LOCYL and HICYL	LOCYL HICYL SEEK LOOP BYCKAD
Disc Restore Operation failure	Refer to Test 14 which provides Seek/Restore Scope Loop capability. Run with SEEK option = 0 which results in alternate Seek and Restore operations to LOCYL.	LOCYL SEEK LOOP BYCKAD
Disc Controller Read-Check Operational failure	Refer to Test 13 which provides Read Check Scope loop capability. Select the desired Head and Sector using the SECTOR option.	BYCKAD SECTOR LOCYL
Disc Controller Read and Write	For isolating non-formatting read and write errors, use the normal mode scope loop, Test D. Select the desired head and sector using the SECTOR option and desired data using the DATA option. The SCOPE option controls Read/Write/data compare, read only, or write only features. Similarly, for formatting operation failures, use the format mode scope loop (TEST E) as above.	SECTOR DATA LOCYL SCOPE

Fault Isolation Table

---

Fault Identification	Recommended Troubleshooting Procedure	Related Options
Data Compare Failure on Read/Write operations	Run Tests 8, 9 or A which use spiral, worst case, and random data respectively. Attempt to establish some pattern of data failure. As a further means of isolation, use the Normal Mode Scope loop with various data patterns as selected by the DATA option. Test A provides a pseudo-random data pattern to be used in disc transfers which represent worst-case data for the controller data separation network. In addition, the SECNUM option provides a means of executing data transfers of one or more sectors.	SECNUM DATA LOCYL HICYL SCOPE LOOP SECTOR BUFSIZ
Write-Protect Logic failure	Use Normal Mode Scope Loop and the Loop option to isolate the failure (TEST D).	SCOPE LOOP SECTOR DATA BUFSIZ
Controller Sector Header Logic failure	Test 5 (Format Mode Testing) exercises Defective Sector logic and identifies failures in this area. For further hardware fault isolation use the Defective Sector Scope Loop (TEST F).	SCOPE LOOP SECTOR DATA

---

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## OTHER MESSAGES

Messages other than the error messages already discussed may be displayed. These are either error or advisory messages, and are shown below.

1. INVALID XXXXXX OPTION

This message is printed after the 'RUN' command is entered, if the XXXXXX option has not been entered, or is incorrect.

2. SOLID ERROR:

TEST XX ABORTED

This message is printed if more errors occur in Test XX than the maximum specified by the RETRY option.

3. WRITE PROTECT ON

This message is printed if Test XX attempts to write to the Disc and sees Drive Write Protect Status.

4. ALTERNATE CHANNEL BUSY

TEST XX ABORTED

This message is printed if Status = X'20' for the indicated Drive when sensed in Test XX.

5. DEF SEC FLAGGED TTT HH KK

FLAG REJECTED < - - - X

This message is printed if a Defective Sector is detected and flagged, during the execution of the Re-Format Test (Test 17). Cylinder, head and sector information is displayed as TTT HH KK. If reading the sector just flagged does not give Defective Sector status, FLAG REJECTED is printed.

6. TEST XX

This message indicates the test in progress.

7. NO ERROR

This message indicates that the specified test sequence was completed without the detection of an error.

8. TAKE DRIVE OFF-LINE

PUT DRIVE ON-LINE

SET WRITE-PROTECT ON

SET WRITE-PROTECT OFF

These messages are displayed during execution of the Manual Intervention Test (Test B), and are instructions to the user to place the Drive under test in the stated condition. Depress the BREAK key to exit the test, if the Drive Write-Protect feature is not equipped.

9. ILLEGAL CYLADRS-CE PACK

This message is displayed when an illegal cylinder address is specified for a Customer Engineer Pack (PACTYP=CEXX).

10. SELECT NEW SECTOR OPTION

If the required number of consecutive sectors of the track specified by the LOCYL and SECTOR options are not defect-free, this message is displayed. The user should select a different track and rerun the test until an error-free condition is encountered.

11. ENTER DELETED HEADS

This message is displayed as the result of the user's entering a HEADS 1 option. See Appendix 3.

12. RE-FORMAT LOCYL

This message is displayed after the selected test sequence terminates, if any test in the sequence wrote to the Disc in Format Mode (potentially destroying the Address Mark Sectoring). When this message is displayed, the Re-Format Test (Test 17) should be selected and Run.

13. \*ABORTED\*

This message is displayed when testing is aborted by depression of the BREAK key on the Console Device.

14. DRIVE OFF-LINE

This message indicates that an attempt to communicate with the indicated Drive returned Drive Status X'09'.

15. FORMAT SWITCH OFF

This message indicates that the Format Switch in the Disc System Controller is not in the FORMAT (0) position.

16. PROTECTED WRITE VIOLATION

This message indicates that an attempt was made to perform a Write-with-Protection operation on a sector formatted as Write-Protected.

17. SOFT READ ERROR

This message indicates that a Read or Read-Check operation failed on the first attempt, but was successful the second time.

18. HARD READ ERROR

This message indicates that a Read or Read-Check operation failed two consecutive attempts.

19. MEMORY LIMIT EXCEEDED

This message indicates that insufficient memory is available for the attempted Read or Write operation. In this case, the SECNUM, INBUF, and/or OUTBUF options must be modified, before attempting to run the test. See Appendix 3.

20. REFORMAT ABORTED

This message indicates that format on the track specified by the LOCYL and SECTOR options could not be restored. It is mandatory that Test 17 be selected and run successfully before removing the Disc Pack from the Drive. Failure to complete the re-format of the specified track will invalidate pack certification.

21. ALTERNATE SECTOR ASSIGNED

This message indicates that sector X'40' exists on the specified track. If the message SELECT NEW SECTOR OPTION is then printed, the condition was detected during track evaluation, and is considered normal. Otherwise, this message indicates that the address mark for X'40' could not be erased.

22. PROCEED WITH CAUTION

This message indicates that pack certification may be destroyed as a result of inhibiting automatic track evaluation and re-format. The user should endeavor to use only tracks which were certified with no defective or alternated sectors, and restore the tracks to their original condition before attempting normal use of the pack or removing the pack from the Drive.



APPENDIX 6 - CROSS REFERENCE

A6-1

TEST	OPTIONS USED	Interrupts Used	Require Formatted Disc	Destroy Data	Destroy Format	NOTES
0	Global	NO	NO	NO	NO	' Global' refers to the following options: TEST, LOOP, CONTIN, SELCH, DISCON, DRIVE, RETRY, TIMVAL, PACTYP, INBUF, OUTBUF.
1	Global, BYCKAD	NO	YES*	NO	NO	
2	Global, BYCKAD	NO	YES*	NO	NO	
3	Global, BYCKAD, HICYL, LOCYL	NO	YES*	NO	NO	
4	Global	YES	YES	NO	NO	
5	Global, LOCYL, HICYL	NO	YES	YES	YES	Restores format as part of normal test sequence
6	Global, LOCYL	NO	YES	YES	NO	Requires HEADS = 0
7	Global, LOCYL	YES	YES	NO	NO	
8	Global, LOCYL, HICYL, SECNUM	NO	YES	YES	NO	
9	Global, LOCYL, HICYL, SECNUM	NO	YES	YES	NO	
A	Global, LOCYL, HICYL, SECNUM	NO	YES	YES	NO	
B	Global, LOCYL	NO	NO	NO	NO	
C	Global, XFILE, LOCYL, BUFSIZ, SECTOR, SECNUM	YES	YES	NO	NO	Requires 2 Drives

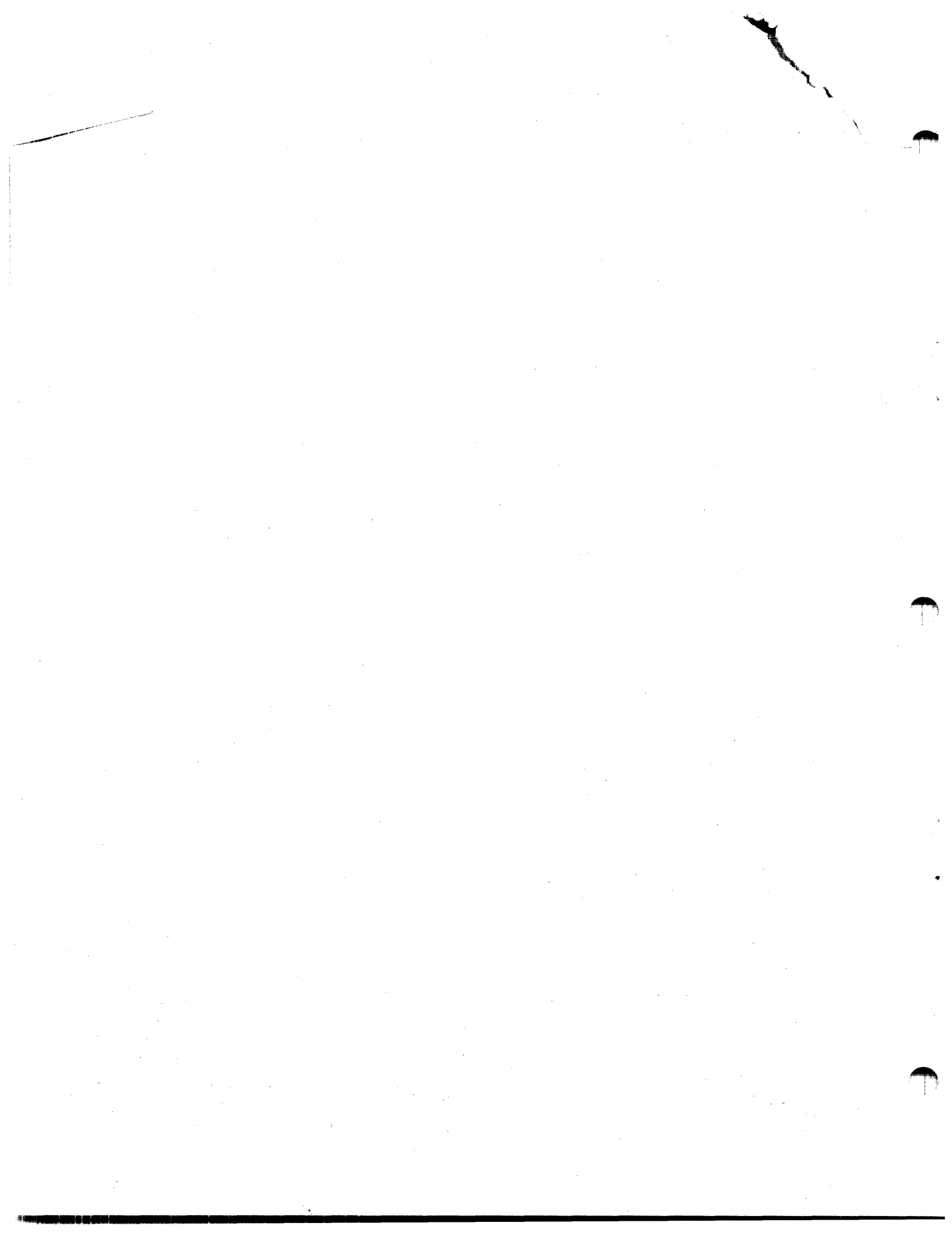
\*Formatted pack not required if "BYCKAD" = 1.

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TEST	OPTIONS USED	Interrupts Used	Required Formatted Disc	Destroy Data	Destroy Format	NOTES
D	Global, LOCYL, SECTOR, DATA, BUFSIZ, SCOPE	NO	YES	YES	YES	Restores Format as part of normal test sequence.
E	Global, LOCYL, SECTOR, SCOPE, BUFSIZ	NO	YES	YES	YES	See Above.
F	Global, LOCYL, SECTOR, SCOPE	NO	YES	YES	YES	See Above.
10	Global, LOCYL, SECTOR, SCOPE	NO	YES	YES	YES	See Above.
11	Global, LOCYL, SECTOR, SCOPE	NO	YES	YES	YES	See Above.
12	Global, LOCYL, SECTOR, SCOPE	NO	YES	YES	YES	See Above.
13	Global, LOCYL, SECTOR	NO	YES	NO	NO	
14	Global, LOCYL, HICYL, SEEK, BYCKAD	NO	YES*	NO	NO	
15	Global, LOCYL, HICYL	NO	YES	NO	NO	
16	Global, LOCYL, SECTOR, OFFSET	NO	YES	YES	NO	
17	Global, LOCYL	NO	NO	YES	YES	Restores Format

\*Formatted Disc not required if BYCKAD = 1.

TEST	OPTIONS USED	Interrupts Used	Require Formatted Disc	Destroy Data	Destroy Format	NOTES
18	Global, LOCYL, SECTOR, SCOPE	NO	YES	NO	NO	
19	Global, LOCYL, SECTOR	NO	YES	YES	YES	Restores Format as part of normal test sequence.
1A	Global, LOCYL	NO	YES	YES	YES	See Above.
1B	Global, LOCYL, SECTOR, SCOPE	NO	YES	YES	YES	See Above.
1C	Global, LOCYL, SECTOR	NO	YES	YES	YES	See Above.



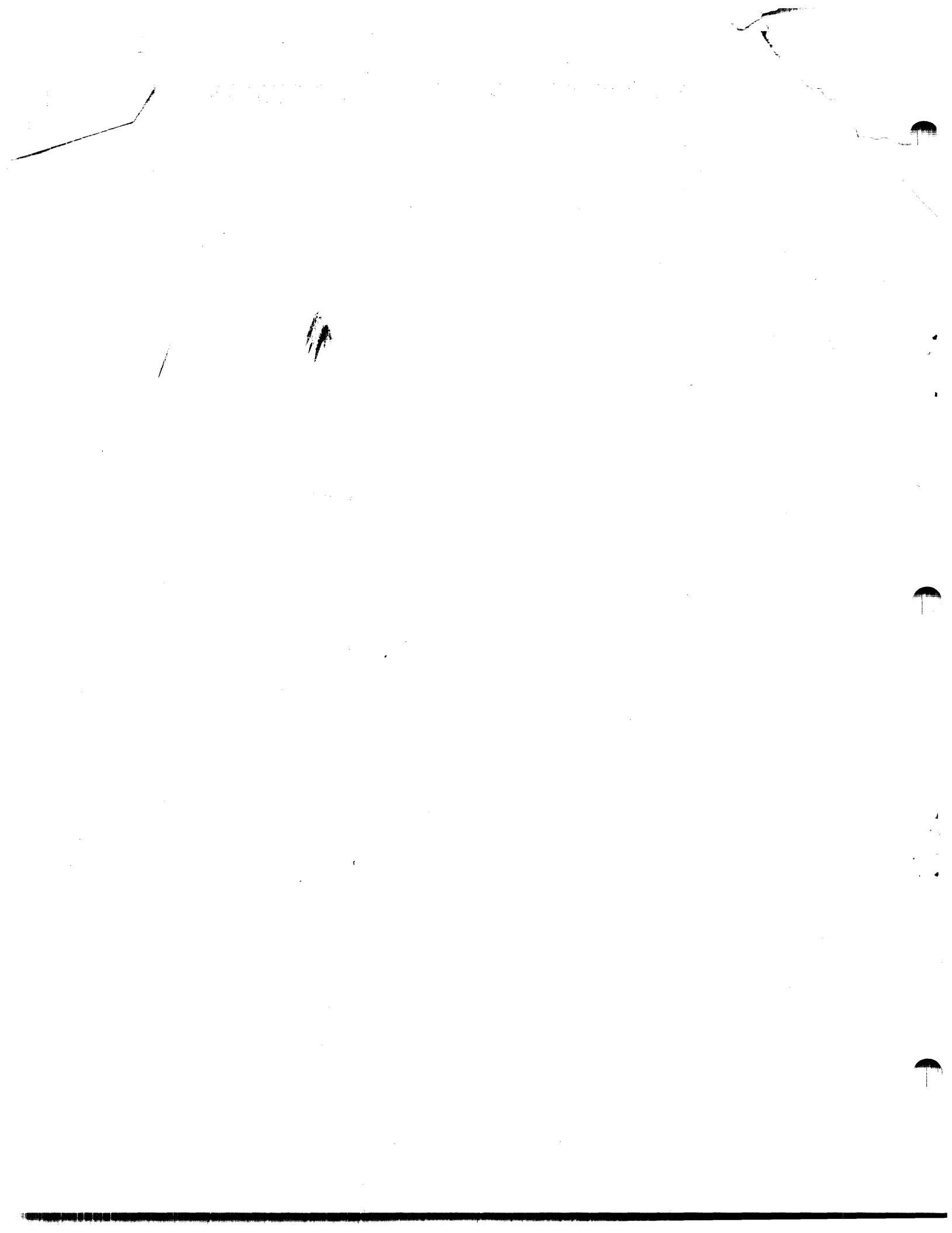
APPENDIX 7 - STATUS, COMMAND, and DATA BYTES

A7-1/A7-2

DRIVE COMMAND, STATUS, AND DATA BYTES

BIT	0	1	2	3	4	5	6	7	
	DIS	EN	SET HEAD #	SET CYL #			SEEK	RESTORE	
CMD	RELEASE	CLEAR FAULT	1	1	SERVO OFFSET PLUS	SERVO OFFSET MINUS	DATA STROBE EARLY	DATA STROBE LATE	COMMAND BYTES
WD							CYL 512	CYL 256	
WD	CYL 128	CYL 64	CYL 32	CYL 16	CYL 8	CYL 4	CYL 2	CYL 1	CYLINDER ADDRESS
WD				HEAD 16	HEAD 8	HEAD 4	HEAD 2	HEAD 1	HEAD ADDRESS
SS	WRITE PROTECT		ALT CHAN. BUSY	DRIVE UNSAFE	DRIVE <u>READY</u>	EX	SEEK INC.	OFF- LINE	STATUS BYTE
RD			SECT 32	SECT 16	SECT 8	SECT 4	SECT 2	SECT 1	ROTATIONAL POSITION

B06-200A15 R01 7/77



PROG= MSMTST ASSEMBLED BY CAL 03-066R05-00 (32-BIT)

000CR

1	* EDITED 062577	MST00010
2	ALSTC	MST00020
3	AOSGZ	
4	IFNZ ADC-2	MST00040
33	ELSE	
35	CROSS	
36	WIDTH 120	MST00350
37	**	MST00360
38	* COMMON MSM DISC TEST 06-200F01R01 (16-BIT)	MST00370
39	* COPYRIGHT INTERDATA, INC. JUNE, 1977	MST00380
40	*	MST00390
41	* PROGRAM USES THE COMMON INSTRUCTION SET.	MST00400
42	*	MST00410
43	* THIS PROGRAM PROVIDES A COMPREHENSIVE TEST OF THE INTERDATA MSM	MST00420
44	* FAMILY OF DISC DRIVES. FORMAT AND NORMAL MODE TESTING, SEEK	MST00430
45	* INTERRUPT QUEUING, MULTIPLE-FILE DATA TRANSFERS, DUAL-PCRT OPERATION,	MST00440
46	* OFF-LINE READ/WRITE FORMAT, AND DEFECTIVE SECTOR ALTERNATION	MST00450
47	* ARE SUPPORTED.	MST00460
48	*	MST00470
49	* THERE ARE 22 OPTIONS AVAILABLE TO THE USER, AND TWENTY ERROR	MST00480
50	* MESSAGES TO AID IN THE ISOLATION OF A FAULT AT THE HARDWARE LEVEL.	MST00490
51	*	MST00500
52	* THE PROGRAM REQUIRES A 6/16, 7/16, OR EQUIVALENT PROCESSOR,	MST00510
53	* WITH 24K BYTES OF MEMORY. OPTIONS AND RUN COMMAND ARE TO BE ENTERED	MST00520
54	* VIA A CONSOLE DEVICE. A SINGLE DISC SYSTEM CONTROLLER AND ITS	MST00530
55	* ATTACHED DRIVES MAY BE TESTED AT ONE TIME.	MST00540
56	*	MST00550
57	* THE 06-200F01M17R01 TAPE IS AN ABSOLUTE TAPE WITH FRONT-END BOOT	MST00560
58	* LOADER.	MST00570
59	*	MST00580
60	* ANY COMBINATION OF THE TESTS MAY BE SELECTED AS A STRING AND CAN	MST00590
61	* BE RUN OR LOADED CONTINUOUSLY.	MST00600
62	ENDC	MST00610
		MST00620

		64	**ETPE			MST00640	
		65	*			MST00650	
		66	*			MST00660	
	0000 0000	67	R0	EQU	0	MST00670	
	0000 0001	68	R1	EQU	1	MST00680	
	0000 0002	69	R2	EQU	2	MST00690	
	0000 0003	70	R3	EQU	3	MST00700	
	0000 0004	71	R4	EQU	4	MST00710	
	0000 0005	72	R5	EQU	5	MST00720	
	0000 0006	73	R6	EQU	6	MST00730	
	0000 0007	74	R7	EQU	7	MST00740	
	0000 0008	75	R8	EQU	8	MST00750	
	0000 0009	76	R9	EQU	9	MST00760	
	0000 000A	77	R10	EQU	10	MST00770	
	0000 000B	78	R11	EQU	11	MST00780	
	0000 000C	79	R12	EQU	12	MST00790	
	0000 000D	80	R13	EQU	13	MST00800	
	0000 000E	81	R14	EQU	14	MST00810	
	0000 000E	82	RET	EQU	14	MST00820	
	0000 000F	83	R15	EQU	15	MST00830	
	0000 000F	84	LINK	EQU	15	MST00840	
		85	*			MST00850	
		86	* BOOTLOADER WITH CHKSUM			MST00860	
		87	*			MST00870	
0000R		88	ORG	X'80'		MST00880	
0080	2421	89	LIS	R2,1		MST00890	
0082	2303	90	BS	BOOT		MST00900	
0084	3DF8	91	DC	Z(PSWSAVE)	CURRENT PSM SAVE POINTER(32-BIT M/C)	MST00910	
008E	3E00	92	DC	Z(RSAVE)	REGISTER SAVE POINTER(32-BIT M/C)	MST00920	
0088	C810 0A00	93	BOOT	LHI	R1,ORIGIN1	R1 = ADR( FIRST BYTE OF TEST PROG )	MST00930
008C	C830 3DE9	94		LHI	R3,LNZB	R3 = ACR( LAST NON-ZERO BYTE )	MST00940
0090	4030 0022	95		STH	R3,X'22'	REG SAVE POINTER, 16-BIT MACHINE	MST00950
0094	C860 00FF	96	MN	LHI	R6,X'00FF'	R6 = CHKSUM BYTE = X'MN'	MST00960
0098	D340 0078	97		LB	R4,X'78'	INPUT DEV ADR	MST00970
009C	DE40 0079	98		OC	R4,X'79'		MST00980
00A0	9D45	99	LEADER	SSR	R4,R5		MST00990
00A2	2091	100		BTBS	9,1	DU,BSY	MST01000
00A4	5B45	101		RDR	R4,R5		MST01010
00A6	0855	102		LDAR	R5,R5		MST01020
00A8	2234	103		BZS	LEADER	IGNORE LEADER	MST01030
00AA	D251 0000	104	LOAD	STB	R5,0(R1)	STORE 1ST NON-ZERO & SUBSEQUENT BYTE	MST01040
00AE	C351 0000	105		LB	R5,0(R1)	RELOAD DATA BYTE TO	MST01050
00B2	0765	106		XAR	R6,R5	GENERATE CHKSUM	MST01060
00B4	5481	107		EXBR	R8,R1		MST01070
00B6	5828	108		WHR	R2,R8	DISPLAY MEMORY ADDRESS	MST01080
00B8	9D45	109		SSR	R4,R5		MST01090
00BA	2091	110		BTBS	9,1	DU,BSY	MST01100
00BC	5B45	111		RDR	R4,R5		MST01110
00BE	C110 00AA	112		BXLE	R1,LOAD	LOAD TILL LAST BYTE	MST01120
00C2	5486	113		EXBR	R8,R6		MST01130
00C4	5828	114		WHR	R2,R8	FINAL CHKSUM	MST01140
00C6	2478	115	LDWT	LIS	R7,8		MST01150
00C8	517C	116		SLLS	R7,12	R7 = X'8200'	MST01160
00CA	5557	117		EPSR	R5,R7	HALT PROCESSOR.	MST01170
00CC	2203	118		BS	LDWT		MST01180



## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

00CE		120	ORG	X'A00'		MST01200	
	0000 0A00	121	CRIGIN1	EGU *	**	MST01210	
0A00		122	IFZ	ADC-2	**	MST01220	
0A00	4300 0A00	123	B	ORIGIN1	INVALID ENTRY	**	MST01230
0A04	4300 0A44	124	B	START2	START HERE FOR 16-BIT PROCESSOR	**	MST01240
0A08	4300 0A00	125	B	ORIGIN1	INVALID ENTRY	**	MST01250
0A0C	4300 0A60	126	B	START4	SPECIAL 16-BIT ENTRY	**	MST01260
		127	ELSE		*	**	MST01270
		132	ENDC				MST01320
		133	*				MST01330
		134	*-----*				MST01340
		135	* TEST CONSTANTS				MST01350
		136	*				MST01360
0A10	0202	137	IO	DC X'0202'	I/O DEVICE(S) IDENTIFIER		MST01370
0A12	1011	138	PASLADR	DC X'1011'	PASLA/PALM READ/WRITE ADDRESSES		MST01380
0A14	C202	139	CLIFADR	DC X'0202'	CURRENT LOGP INTERFACE R/L ADDRESSES		MST01390
0A16	E262	140	LPADR	DC X'6262'	LINE PRINTER ADDRESS		MST01400
0A18	1011	141	C300ADR	DC X'1011'	CAROUSEL 320/PASLA ADDRESSES		MST01410
0A1A	C000	142	DCX	0	PROVISION FOR SPECIAL DEVICE		MST01420
0A1C	C140	143	TIME	DC X'140'	CONSTANT FOR 1 MS DELAY(X'C8'-MOD70)		MST01430
0A1E	0000	144	DCX	0	RESERVED		MST01440
0A20	30F0	145	PSW	DCX 30F0	PSW USED IN PROGRAM		MST01450
0A22	30F0	146	PSW2	DCX 30F0	PSW USED IN EXEC		MST01460
0A24	70F0	147	PSW3	DCX 70F0	ENABLE INTERRUPTS		MST01470
0A26	C000	148	DCX	0	RESERVED		MST01480
0A28	0000	149	DCX	0	RESERVED		MST01490
0A2A	0000	150	DCX	0	RESERVED		MST01500
0A2C	0000	151	DCX	0	RESERVED		MST01510
		152	*-----*				MST01520
		153	*				MST01530
0A2E	0711	154	START1	XAR R1,R1			MST01540
0A30	4010 0030	155	STH	R1,X'30'	DISABLE INT AT PROCESSOR LEVEL		MST01550
0A34	4820 0A22	156	LH	R2,PSW2			MST01560
0A38	4020 0032	157	STH	R2,X'32'	SELECT REG SET 15		MST01570
0A3C		158	IFZ	ADC-2			MST01580
0A3C	2521	159	LCS	R2,1			MST01590
0A3E	4020 1636	160	STH	R2,MOD32	SET MODEL 32 PROCESSOR FLAG		MST01600
0A42	2306	161	BS	ST			MST01610
0A44	0711	162	START2	XAR R1,R1			MST01620
0A46	4010 1636	163	STH	R1,MOD32	RESET MCD 32 PROCESSOR FLAG		MST01630
0A4A	4810 0A22	164	LH	R1,PSW2			MST01640
		165	ENDC				MST01650
0A4E	C820 0A64	166	ST	LHI R2,START			MST01660
0A52	4010 0034	167	STH	R1,X'34'			MST01670
0A56	4020 0036	168	STH	R2,X'36'	II INT NEW PSW LOC		MST01680
0A5A	0000	169	DCX	0	TAKE AN ILLEGAL INSTRUCTION INT		MST01690
		170	*				MST01700
0A5C	4300 0A2E	171	START3	B START1	INSERT SPECIAL ROUTINE HERE		MST01710
0A60		172	IFZ	ADC-2			MST01720
0A60	4300 0A44	173	START4	B START2	INSERT SPECIAL ROUTINE HERE		MST01730
		174	ENDC				MST01740
		175	*				MST01750
0A64	41F0 1334	176	START	BAL LINK,SETKB	ESTABLISH KEYBOARD DEVICE		MST01760

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

0A68	9300		177	LBR	R0,R0	TO TEST 'IO' BYTE	MST01770
0A6A	2701		178	SIS	R0,1	CRT ON PASLA ?	MST01780
0A6C	4330	0A90	179	BZ	CRT	BRANCH IF YES.	MST01790
0A70	2703		180	SIS	R0,3	CARCUSEL ON PASLA ?	MST01800
0A72	4200	0A72	181	NOP	*	PROVISION FOR SPECIAL KBD DEVICE	MST01810
0A76	4230	0A80	182	BNZ	TTY	BRANCH IF NO.	MST01820
0A7A	4000	1246	183	C300	STH	RESET TRANS PAUSE FLAG	MST01830
0A7E	4800	0A18	184	LH	R0,C300ADR	LOAD CAROUSEL/PASLA ADDRESSES	MST01840
0A82	4810	1658	185	LH	R1,CARRD	CARCUSEL COMMANDS	MST01850
0A86	4820	1660	186	LH	R2,CAR2ND	PASLA/PALM FORMAT COMMAND	MST01860
0A8A	0340	165B	187	LB	R4,CARRG2S		MST01870
0A8E	2309		188	BS	CRT2		MST01880
0A90	4810	1656	189	CRT	LH	CRT/PASLA COMMANDS	MST01890
0A94	4800	0A12	190	LH	R0,PASLADR	LOAD PASLA ADDRESSES	MST01900
0A98	4820	165E	191	LH	R2,CRT2ND	AND FORMAT COMMAND	MST01910
0A9C	0340	165A	192	LB	R4,CRTG2S		MST01920
0AA0	4000	164E	193	CRT2	STH	SET 'CONSOLE ON PASLA' FLAG	MST01930
0AA4	5330		194	LBR	R3,R0		MST01940
0AAE	5452		195	EXBR	R5,R2	POSITION 2ND CMD	MST01950
0AA8	5E35		196	OCR	R3,R5	SET PASLA/PALM FORMAT	MST01960
0AAA	0240	165C	197	STB	R4,CONRG2S		MST01970
0AAE	230A		198	BS	GOTIT		MST01980
0AB0	2400		199	TTY	LIS		MST01990
0AB2	4000	164E	200	STH	R0,PASFLG	RESET 'CONSOLE ON PASLA' FLAG	MST02000
0AB6	4800	0A14	201	LH	R0,CLIFADR	LOAD CURRENT LOOP INTERFACE ADDRESS	MST02010
0ABA	4810	1664	202	LH	R1,CLIFRC	AND COMMANDS	MST02020
0ABE	4820	1666	203	LH	R2,CLIF2ND		MST02030
			204	*			MST02040
0AC2	4000	1650	205	GOTIT	STH	CONSOLE DEVICE ADDRESSES	MST02050
0AC6	4010	1652	206		STH	CONSOLE READ/WRITE COMMANDS	MST02060
0ACA	4020	1654	207		STH	AND FORMAT COMMAND (PASLA/PALM)	MST02070
0ACE	41F0	1388	208		BAL	SET UP LOW CORE	MST02080
0AD2	2400		209		LIS		MST02090
0AD4	4000	1672	210		STH	RESET 'DEVICE UNAVAILABLE' FLAG	MST02100
0AD8	4000	1926	211		STH	'FORMAT PCT. DESTROYED' FLAG RESET**	MST02110
0ADC	41F0	11C6	212		BAL		MST02120
0AEO	0850	19A4	213		LHI		MST02130
0AE4	4050	166C	214		STH	FORCE PRINT **	MST02140
0AE8	41F0	1126	215		BAL	PRINT TEST PROGRAM TITLE	MST02150
			216				MST02160
			217		*	* KEYBOARD INPUT ROUTINE	MST02170
			218		*		MST02180
	0000	0AEC	219	OPTIN	EQU	*	MST02190
0AEC	41F0	11C6	220		BAL	CR,LF TO LIST DEVICE	MST02200
	0000	0AF0	221	OPTIN1	EGU	*	MST02210
0AF0	4820	0A22	222		LH	R2,PSW2	MST02220
0AF4	9512		223		EPSR	R1,R2	MST02230
0AF6	41F0	1334	224	OPTIN2	BAL	LINK,SETKB	MST02240
0AFA	0340	1744	225		LB	R4,AMSG	MST02250
0AFE	41F0	11D4	226		BAL	LINK,OUTCHR	MST02260
0B02	2541		227		LCS	R4,1	MST02270
0B04	41F0	11D4	228		BAL	LINK,OUTCHR	MST02280
0B08	08C0	1270	229		LHI	R12,QUESTA	MST02290

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

0B0C	C800	2020	230	LHI	R0,X*2020*	ELANK OUT COMMAND BUFFER	MST02300	
0B1C	4000	3DEA	231	STH	R0,OPTBUF	WHICH WILL CONTAIN OPTION	MST02310	
0B14	4000	3DEC	232	STH	R0,OPTBUF+2	NAME	MST02320	
0B1E	4000	3DEE	233	STH	R0,OPTBUF+4		MST02330	
0B1C	0711		234	XAR	R1,R1	CLEAR OPTBUF INDEX	MST02340	
0B1E	41F0	1248	235	RDCHR	BAL R15,GETCHR	GET A CHAR IN R4	MST02350	
0B22	C540	0060	236	CLHI	R4,X*60*	UPPER CASE ALPHA ?	MST02360	
0B2E	2183		237	BLS	RDCHAR0	BRANCH IF NO.	MST02370	
0B28	CB40	0020	238	SHI	R4,X*20*	CONVERT TO LOWER CASE	MST02380	
0B2C	C540	0023	239	RDCHAR0	CLHI R4,X*23*	IS IT # ?	MST02390	
0B30	4330	0AEC	240	BE	OPTIN		MST02400	
0B34	C540	005F	241	CLHI	R4,X*5F*	LEFT ARROW, UNDERLINE OR DELETE ?	MST02410	
0B38	2139		242	BNES	RDCHR1		MST02420	
0B3A	2711		243	SIS	R1,1	YES, DECREMENT INDEX	MST02430	
0B3C	C21C		244	BMR	R12	BUFFER UNDERFLOW; PRINT '??'	MST02440	
0B3E	C800	0020	245	LHI	R0,X*20*		MST02450	
0B42	C201	3DEA	246	STB	R0,OPTBUF(R1)		MST02460	
0B4E	4300	0B1E	247	B	RDCHR		MST02470	
0B4A	C540	000D	248	RDCHR1	CLHI R4,X*0D*	IS IT CR ?	MST02480	
0B4E	233C		249	BES	LOOKUP	YES, TRY MATCH	MST02490	
0B50	C540	0020	250	CLHI	R4,X*20*	IS IT A BLANK?	MST02500	
0B54	2339		251	BES	LOOKUP	YES, TRY MATCH	MST02510	
0B56	C510	000E	252	CLHI	R1,6	7 CHARACTERS INPUT ?	MST02520	
0B5A	C38C		253	BNLR	R12	IF YES, ERROR	MST02530	
0B5C	C241	3DEA	254	STB	R4,OPTBUF(R1)	STORE CURRENT BYTE	MST02540	
0B60	2611		255	AIS	R1,1	BUMP BUFFER INDEX	MST02550	
0B62	4300	0B1E	256	B	RDCHR	READ NEXT CHARACTER	MST02560	
			257	-----				MST02570
			258	* OPTION MATCH ROUTINE				MST02580
			259	*				MST02590
0B6E	C810	174E	260	LOOKUP	LHI R1,CPT	LOAD ADDRESS OF OPTION TABLE	MST02600	
0B6A	0733		261	LOOK1	XAR R3,R3	CLEAR BUFFER INDEX	MST02610	
0B6C	0861		262	LDAR	R6,R1	SET OPTION WORD INDEX	MST02620	
0B6E	4856	0000	263	LOOK2	LH R5,0(R6)		MST02630	
0B72	021C		264	BMR	R12	IF MINUS, THEN NO MATCH = ERROR	MST02640	
0B74	4553	3DEA	265	CLH	R5,OPTBUF(R3)	COMPARE TO OPTBUF HW	MST02650	
0B78	2333		266	BES	LOOK3		MST02660	
0B7A	261C		267	AIS	R1,12		MST02670	
0B7C	2209		268	ES	LOOK1		MST02680	
0B7E	2632		269	LOOK3	AIS R3,2	TRY NEXT HW	MST02690	
0B80	2662		270	AIS	R6,2		MST02700	
0B82	C530	000E	271	CLHI	R3,6	3 MATCHING HW FOUND ?	MST02710	
0B8E	208C		272	BLS	LOOK2		MST02720	
			273	*				MST02730
0B8E	C510	188A	274	CLHI	R1,RUN	RUN COMMAND ?	MST02740	
0B8C	4330	0D18	275	BE	RUNIT		MST02750	
0B90	C510	187E	276	CLHI	R1,OPTION	OPTION CMC ?	MST02760	
0B94	4230	0C8A	277	BNE	LOOK4	NO, LOOK FURTHER	MST02770	
			278	-----				MST02780
			279	* TO PROCESS INPUT COMMAND 'OPTION'				MST02790
0B98	4820	188E	280	LH	R2,OPTION+8	CHECK FOR SPECIAL ROUTINE	MST02800	
0B9C	0232		281	BNZR	R2	LINK TO ROUTINE	MST02810	
0B9E	C830	174E	282	OPTRTN	LHI R3,TEST	RETURN HERE	MST02820	

## EXEC - ETPE R03P1 (W/CONDITICNAL ASSEMBLY)

0BA2	C8E0 0C28	283	LHI	R14,OPTCMD8		MST02830
0BA6	41F0 11C6	284	BAL	LINK,CRLF		MST02840
0BAA	0722	285	CPTCMD	XAR	R2,R2	RESET COUNTER
0BAC	D342 1746	286	CPTCMD1	LB	R4,OPT(R2)	TO PRINT TEST
0BBC	41F0 11D4	287	BAL	LINK,OUTCHR		MST02870
0BB4	2621	288	AIS	R2,1		MST02880
0BB6	C520 0006	289	CLHI	R2,6		MST02890
0BB8	2087	290	BLS	OPTCMD1		MST02900
0BBC	C840 0020	291	LHI	R4,C' '		MST02910
0BC0	41F0 11D4	292	BAL	LINK,OUTCHR	OUTPUT 1 SPACE	MST02920
0BC4	0755	293	XAR	R5,R5	TO PRINT SELECTED TEST NUMBERS	MST02930
0BC6	4050 1634	294	STH	R5,FIRST		MST02940
0BCA	4823 0006	295	LH	R2,6(R3)	FIRST TEST WORD	MST02950
0BCE	2440	296	OPTCMD2	LIS	R4,0	START WITH TEST 0
0BD0	4040 3DF2	297	STH	R4,TEMP		MST02970
0BD4	5121	298	CPTCMD3	SLHLS	R2,1	MST02980
0BD6	4380 0C08	299	BNC	OPTCMD7		MST02990
0BDA	4040 3DF2	300	OPTCMD4	STH	R4,TEMP	OPTION VALUE FOUND.
0BDE	4800 1634	301	LH	R0,FIRST	IS IT FIRST ?	MST03000
0BE2	2335	302	BZS	OPTCMD5		MST03010
0BE4	C840 002C	303	LHI	R4,C','	NO, OUTPUT COMMA	MST03020
0BE8	41F0 11D4	304	BAL	LINK,OUTCHR		MST03030
0BEC	40F0 1634	305	OPTCMD5	STH	LINK,FIRST	MST03040
0BF0	0855	306	LDAR	R5,R5	TEST VALUE FROM SECOND HW	MST03050
0BF2	2335	307	BZS	OPTCMD6	NO	MST03060
0BF4	C840 0031	308	LHI	R4,C'1'	YES,OUTPUT '1'	MST03070
0BF8	41F0 11D4	309	BAL	LINK,OUTCHR		MST03080
0BFC	4840 3DF2	310	OPTCMD6	LH	R4,TEMP	RESTORE R4
0C00	D344 168A	311	LB	R4,HEXTAB(R4)	CONVERT	MST03100
0C04	41F0 11D4	312	BAL	LINK,OUTCHR	OUTPUT 0-F	MST03110
0C08	4840 3DF2	313	OPTCMD7	LH	R4,TEMP	RESTORE
0C0C	2641	314	AIS	R4,1	INCREMENT TEST #	MST03120
0C0E	4040 3DF2	315	STH	R4,TEMP		MST03130
0C12	C540 0010	316	CLHI	R4,16		MST03140
0C16	4280 08D4	317	BL	OPTCMD3		MST03150
0C1A	0855	318	OPTCMD71	LCAR	R5,R5	DONE ?
0C1C	023E	319	BNZR	R14		MST03160
0C1E	4823 0008	320	LH	R2,8(R3)	SECOND TEST WORD	MST03170
0C22	2451	321	LIS	R5,1	R5 = 1 FOR SECOND TEST HW	MST03180
0C24	4300 0BCE	322	B	OPTCMD2		MST03190
		323	-----			MST03200
		324	* TO OUTPUT OTHER OPTION NAMES & VALUES			MST03210
		325	*			MST03220
0C28	41F0 11C6	326	OPTCMD8	BAL	LINK,CRLF	MST03230
0C2C	2461	327	LIS	R6,1	SET LINE COUNTER	MST03240
0C2E	C820 1752	328	LHI	R2,OPT+12	R2 POINTS TO THE NAME	MST03250
0C32	2436	329	OPTCMD9	LIS	R3,6	MST03260
0C34	D342 0000	330	OPTCMD10	LB	R4,0(R2)	MST03270
0C38	41F0 11D4	331	BAL	LINK,OUTCHR	OUTPUT OPTION NAME CHAR	MST03280
0C3C	2621	332	AIS	R2,1		MST03290
0C3E	2731	333	SIS	R3,1	6 CHARACTERS OUTPUT ?	MST03300
0C40	2026	334	BPS	OPTCMD10	NO,LOOP	MST03310
0C42	C840 0020	335	LHI	R4,C' '		MST03320
						MST03330
						MST03340
						MST03350

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0C4E	41F0 11D4	336	BAL	LINK,CLTCHR	OUTPUT ONE SPACE	MST03360
0C4A	4852 0000	337	LH	R5,0(R2)	R5 = OPTION VALUE	MST03370
0C4E	2404	338	LIS	R0,4		MST03380
0C50	41F0 10D4	339	BAL	LINK,R5HEX	WRITE OPTION VALUE IN HEX (4 DIGITS)	MST03390
0C54	E300 0A10	340	LB	R0,10		MST03400
0C58	2701	341	SIS	R0,1	CCNSCLE = CRT ?	MST03410
0C5A	213D	342	BNZS	CPTCMD12	BRANCH: NO.	MST03420
0C5C	2661	343	AIS	R6,1	INCREMENT LINE COUNTER.	MST03430
0C5E	C560 0014	344	CLHI	R6,20	PAGE FULL ?	MST03440
0C62	2189	345	BLS	OPTCMD12	NO	MST03450
0C64	0766	346	XAR	R6,R6	INITIALIZE LINE COUNT	MST03460
0C6E	41F0 1248	347	CPTCMD11	BAL LINK,GETCHR		MST03470
0C6A	274D	348	SIS	R4,13	CR ?	MST03480
0C6C	4330 0AEC	349	BZ	OPTIN	TO ACCEPT NEXT COMMAND	MST03490
0C70	2643	350	AIS	R4,3	LF ?	MST03500
0C72	2036	351	BNZS	CPTCMD11	IF YES, PRINT NEXT PAGE	MST03510
0C74	41F0 11C6	352	CPTCMD12	BAL LINK,CRLF		MST03520
0C78	41F0 128A	353	BAL	LINK,TSTBRK	EXIT IF 'BREAK' PRESSED.	MST03530
0C7C	2626	354	AIS	R2,6		MST03540
0C7E	C520 185A	355	CLHI	R2,OPTEND2	ALL PRINTING OPTIONS DONE ?	MST03550
0C82	4280 0C32	356	BL	OPTCMD9	NO,LOOP FOR NEXT ONE	MST03560
0C8E	4300 0AF0	357	B	OPTIN1	TO ACCEPT NEXT COMMAND	MST03570
		358				MST03580
0C8A	C510 1746	359	LOOK4	CLHI R1,TEST	'TEST' OPTION ?	MST03590
0C8E	4330 0CC6	360	BE	TESTOP		MST03600
		361	*	TO PROCESS COMMANDS OTHER THAN 'TEST', 'OPTION'.		MST03610
		362	*			MST03620
0C92	274D	363	SIS	R4,13	OPT FOLLOWED BY CR ?	MST03630
0C94	C33C	364	BZR	R12	YES, ERROR	MST03640
0C9E	41E0 1076	365	BAL	R14,CPTVAL	GET OPTION VALUE IN R6	MST03650
0C9A	274D	366	SIS	R4,13	TERMINATED BY CR ?	MST03660
0C9C	023C	367	BNZR	R12	IF NO, BRANCH	MST03670
0C9E	48E1 0008	368	LH	R14,8(R1)	GET OPTION CHECK ROUTINE ADDRESS	MST03680
0CA2	2332	369	BZS	LOOK5		MST03690
0CA4	01FE	370	BALR	R15,R14	LINK OPTION CHECK ROUTINE	MST03700
	0000 0CA6	371	LOOK5	EGU *	RETURN HERE	MST03710
0CAE	4061 0006	372	STH	R6,6(R1)	STORE OPTION VALUE	MST03720
0CAA	4300 0AEC	373	B	OPTIN	TO ACCEPT NEXT COMMAND	MST03730
		374	*			MST03740
0CAE	C360 FFFE	375	ZERCNE	THI R6,X'FFFE'	IGNORE LSE	MST03750
0CB2	033F	376	BZR	R15	CKAY	MST03760
0CB4	030C	377	BR	R12	ERROR RETURN	MST03770
		378	*			MST03780
0CB6	C560 0400	379	ADR	CLHI R6,X'400'	(R6) = 10 BIT DEVICE ADDRESS	MST03790
0CBA	028F	380	BLR	R15	RETURN TO LOCKS	MST03800
0CBC	030C	381	BR	R12		MST03810
		382	*			MST03820
0CBE	C560 000F	383	LEVEL	CLHI R6,15	(R6) = INTERRUPT LEVEL HEX DIGIT	MST03830
0CC2	028F	384	BLR	R15		MST03840
0CC4	030C	385	BR	R12		MST03850
		386				MST03860
		387	*	TEST OPTION PROCESS ROUTINE		MST03870
		388	*			MST03880

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OCC6	274D	389	TESTOP	SIS	R4,13	'TEST' FOLLOWED BY (CR) ?	MST03890
OCC8	213B	390		BNZS	TSTOP1		MST03900
OCCA	4800 18B8	391		LH	R0,DEFTTESTS	YES, SET TEST OPTICN TO	MST03910
OCCE	4000 174C	392		STH	R0,TEST+6	FIRST TEST WORD	MST03920
OCDE	4800 18BA	393		LH	R0,DEFTTESTS+2	ALL DEFAULT TESTS IN PROGRAM	MST0393C
OCDE	4000 174E	394		STH	R0,TEST+8	SECOND TEST WORD	MST03940
OCDA	4300 0AEC	395		B	OPTIN	TO ACCEPT NEXT COMMAND	MST03950
		396	*				MST03960
OCDE	4850 18F6	397	TSTOP1	LH	R5,MAXTST		MST03970
OCE2	2470	398		LIS	R7,0	TEST BIT ACCUMULATORS	MST03980
OCE4	2480	399		LIS	R8,0		MST03990
OCEE	41E0 1076	400	TSTOP2	BAL	R14,CPTVAL	GET OPTION VALUE IN R6	MST04000
OCEA	0556	401		CLAR	R5,R6		MST04010
OCEC	028C	402		BLR	R12	ERROR: INVALID TEST NUMBER	MST04020
OCEE	C560 0010	403		CLFI	R6,16	RE < 16 ?	MST04030
OCF2	2385	404		BNLS	TSTOP3	NO	MST04040
OCF4	41E0 10AC	405		BAL	R14,UNARY	GET UNARY OPERAND IN R3	MST04050
OCF8	0673	406		CAR	R7,R3	SET CURRENT BIT	MST04060
OCFA	2306	407		BS	TSTOP4		MST04070
OCFC	CB60 0010	408	TSTOP3	SHI	R6,16	RE = 0-F	MST04080
OD00	41E0 10AC	409		BAL	R14,UNARY		MST04090
OD04	0683	410		CAR	R8,R3	SET CURRENT BIT	MST04100
OD06	274D	411	TSTOP4	SIS	R4,13	TERMINATED BY CR ?	MST04110
OD08	4230 OCEE	412		BNZ	TSTOP2		MST04120
OD0C	4070 174C	413		STH	R7,TEST+6	STORE VALID SELECTED TESTS	MST04130
OD10	4080 174E	414		STH	R8,TEST+8		MST04140
OD14	4300 0AEC	415		B	OPTIN	TO ACCEPT NEXT COMMAND	MST04150
		416	-----				MST04160
		417	*				MST04170
		418	RUNIT	EQU	*		MST04180
OD18	0000 OD18	419		BAL	LINK,CRLF		MST04190
OD1C	4800 0A10	420		LH	R0,I0		MST04200
OD20	4000 3DF0	421		STH	R0,IOSAVE	RESTORE USER'S I/O CHOICE	MST04210
OD24	41F0 11C6	422		BAL	LINK,CRLF		MST04220
OD28	41F0 1DF8	423		BAL	LINK,INIT	LINK USER INITIALIZATION ROUTINE	MST04230
	0000 OD2C	424	INITRET	EQU	*	RETURN HERE	MST04240
OD2C	24F0	425		LIS	R15,0	.	** MST04250
OD2E	2440	426		LIS	R4,0	CHECK DEVSACR FALSE SYNC	** MST04260
OD30	4814 1898	427		LH	R1,DEVSACR(R4)	.	** MST04270
OD34	4210 0D5A	428		BM	KEEPO	END OF TABLE	** MST04280
OD38	9D10	429		SSR	R1,R0	.	** MST04290
OD3A	2704	430		SIS	R0,4	FALSE SYNC ?	** MST04300
OD3C	213C	431		BNZS	INSYS	.	** MST04310
OD3E	2403	432	OUTSYS	LIS	R0,3	.	** MST04320
OD40	C820 1716	433		LHI	R2,OUTSYS+4	.	** MST04330
OD44	41F0 10FE	434		BAL	R15,HEXASC	.	** MST04340
OD48	C850 1712	435		LHI	R5,CUSYS	.	** MST04350
OD4C	4050 166C	436		STH	R5,ISITERR	.	** MST04360
OD50	41F0 1126	437		BAL	R15,PRINT	'DEV *** FALSE SYNC'	** MST04370
OD54	2642	438	INSYS	AIS	R4,2	.	** MST04380
OD56	4300 0D30	439		B	INITRET+4	.	** MST04390
OD5A	08FF	440	KEEPO	LDAR	R15,R15	.	** MST04400
OD5C	4230 0AEC	441		BNZ	OPTIN	.	** MST04410

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0D60	40F0 1674	442	STH	R15,WASDU1		MST04420
0D64	240F	443	LIS	RO,15	TO FIND HIGHEST SELECTED TEST NO.	MST04430
0C6E	4810 174E	444	LH	R1,TEST+8	CHECK SECONC TEST HW	MST04440
0D6A	9011	445	KEEP1	SRLS R1,1		MST04450
0C6C	2188	446	BCS	FOUND1	RO = F-0	MST04460
0D6E	2701	447	SIS	RO,1		MST04470
0D70	2213	448	BNMS	KEEP1	TRY NEXT DIGIT	MST04480
0D72	240F	449	LIS	RO,15	INITIALIZE AGAIN	MST04490
0D74	4810 174C	450	LH	R1,TEST+6	CHECK FIRST TEST HW	MST04500
0D78	9011	451	KEEP2	SRLS R1,1		MST04510
0D7A	2186	452	BCS	FOUND1+4	RO = F-0 = TEST #	MST04520
0D7C	2701	453	SIS	RO,1		MST04530
0D7E	2213	454	BNMS	KEEP2	LOOP	MST04540
0D80	030C	455	BR	R12	TEST NOT SELECTED	MST04550
0D82	CA00 0010	456	FOUND1	AHI RO,16	ADJUST TEST # FOR SECOND HW	MST04560
0D8E	4000 1670	457	STH	RO,SELIST	HIGHEST SELECTED TEST NUMBER	MST04570
		458	*			MST04580
		459	*	RESET TEST PARAMETERS		MST04590
		460	*			MST04600
0D8A	0700	461	XAR	RO,RO		MST04610
0D8C	4000 166C	462	STH	RO,ISITERR	RESET ERROR FLAG	MST04620
0D90	4000 1676	463	STH	RO,TOTAL	RESET TOTAL	MST04630
0D94	4000 1678	464	STH	RO,TOTERR	RESET TOTERR	MST04640
0D98	4000 1672	465	STH	RO,WASDU	RESET WASDU	MST04650
0D9C	C810 3030	466	LHI	R1,C*00'		MST04660
0DA0	4010 16A0	467	STH	R1,MTESTNO	RESET THESE FLAGS TO C*00'	MST04670
0DA4	4010 16AA	468	STH	R1,ETESTNO		MST04680
0DA8	4010 16AC	469	STH	R1,ERRNO		MST04690
0DAC	41F0 13B8	470	BAL	LINK,LCORE	SET UP LOW CORE	MST04700
		471	*			MST04710
		472	*	START SELECTION FROM TEST 0		MST04720
		473	*			MST04730
0DB0	0700	474	KEEP3	XAR RO,RO		MST04740
0DB2	4000 167A	475	STH	RO,BTESTNO	RESET BINARY TEST NUMBER	MST04750
0DBE	4000 167E	476	STH	RO,NEXTST	RESET NEXT TEST #	MST04760
		477	*			MST04770
		478	*	TO FIND THE NEXT SELECTED TEST.		MST04780
		479	*			MST04790
0DBA	4820 167E	480	KEEP4	LH R2,NEXTST	GET NEXT TEST #	MST04800
0DBE	2408	481	KEEP41	LIS RO,8		MST04810
0DC0	510C	482	SLHLS	RO,12	RO = X*8000'	MST04820
0DC2	CC02 0000	483	SRHL	RO,0(R2)	RO = NEXT TEST BIT	MST04830
0DC6	C520 0010	484	CLHI	R2,X*10'	NEXT TEST < 16	MST04840
0DCA	2185	485	BLS	KEEP42		MST04850
0DCC	4400 174E	486	NH	RO,TEST+8	LOOK AT TEST HW 2	MST04860
0DD0	2137	487	BNZS	KEEP5		MST04870
0DD2	2304	488	BS	KEEP43		MST04880
0DD4	4400 174C	489	KEEP42	NH RO,TEST+6	LOOK AT TEST HW 1	MST04890
0DD8	2133	490	BNZS	KEEP5		MST04900
0DDA	2621	491	KEEP43	AIS R2,1		MST04910
0DDC	220F	492	BS	KEEP41	LOOP FOR NEXT TEST #	MST04920
0DDE	4020 167A	493	KEEP5	STH R2,BTESTNO	CURRENT TEST #	MST04930
0DE2	0812	494	LDAR	R1,R2	R1 = TEST # IN BINARY	MST04940

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0DE4	2621		495	AIS	R2,1		MST04950	
0DE6	4020	167E	496	STH	R2,NEXTST		MST04960	
0DEA	2402		497	LIS	R0,2	SET DIGITS TO PRINT = 2	MST04970	
0DEC	C820	16A0	498	LHI	R2,MTESTNO	R2 = A(MTESTNO)	MST04980	
0DFC	41F0	10FE	499	BAL	LINK,HEXASC	STORE TEST # IN ASCII & MTESTAC	MST04990	
0DF4	C800	0100	500	LHI	R0,X'0100'	TEST 17 MASK	MST05000	
0DF8	4400	174E	501	NH	R0,TEST+8	IS IT SELECTED ?	** MST05010	
0DFC	2133		502	BNZS	KEEP5A	BRANCH: YES.	** MST05020	
0DFE	41F0	1D26	503	BAL	R15,RFMTCK	CHECK IF RE-FORMAT REQ'D.	** MST05030	
0E02	4820	16A0	504	KEEP5A	LH	R2,MTESTNO	** MST05040	
0E06	4020	16AA	505	STH	R2,ETESTNO	STORE TEST # IN ASCII & ETESTNO	MST05050	
0E0A	41F0	128A	506	BAL	LINK,TSTBRK	TEST BREAK	MST05060	
0E0E	C850	169A	507	LHI	R5,TSTMSG		MST05070	
0E12	41F0	1126	508	BAL	LINK,PRINT	PRINT 'TEST NN'	MST05080	
0E16	0700		509	XAR	R0,R0		MST05090	
0E18	4000	166E	510	STH	R0,NOERR	RESET ERROR FLAG	MST05100	
0E1C	4000	167C	511	STH	R0,COUNT	RESET CCUNT	MST05110	
0E20	4810	0A20	512	KEEP6	LH	R1,PSW	ENABLE INTERRUPTS	MST05120
0E24	9501		513	EPSR	R0,R1		MST05130	
0E26	4820	167A	514	LH	R2,BTESTNO	R2 = TEST #	MST05140	
0E2A	9121		515	SLLS	R2,LADC		MST05150	
0E2C	4812	18BC	516	LDA	R1,TESTS(R2)		MST05160	
0E30	0301		517	BR	R1	GO TO TEST MODULE	MST05170	
			518		-----		MST05180	
			519	*			MST05190	
			520	*	TEST MODULE END ROUTINE		MST05200	
			521	*			MST05210	
			522	TSTEND	EQU	*	MST05220	
0E32	4810	0A22	523	LH	R1,PSW2		MST05230	
0E36	9501		524	EPSR	R0,R1	DISABLE INT & PROCESSOR LEVEL	MST05240	
0E38	4800	167C	525	LH	R0,COUNT		MST05250	
0E3C	2601		526	AIS	R0,1	INCREMENT COUNT	MST05260	
0E3E	4000	167C	527	STH	R0,COUNT		MST05270	
0E42	4500	1824	528	CLH	R0,LOOP+6	IF COUNT > LOOP,	MST05280	
0E46	2385		529	BNLS	KEEP7	GO TO NEXT TEST MODULE	MST05290	
0E48	41F0	128A	530	BAL	LINK,TSTBRK	IF BREAK GO TO OPTIN	MST05300	
0E4C	4300	0E20	531	B	KEEP6	OTHERWISE, REPEAT SAME TEST	MST05310	
0E50	4800	166E	532	KEEP7	LH	R0,NOERR	LOOK @ ERROR FLAG	MST05320
0E54	2135		533	BNZS	KEEP71		MST05330	
0E56	C850	16C0	534	LHI	R5,NOERMSG		MST05340	
0E5A	41F0	1126	535	BAL	LINK,PRINT	PRINT "NO ERROR"	MST05350	
0E5E	4810	167A	536	KEEP71	LH	R1,BTESTNO	GET TEST #	MST05360
0E62	4510	1670	537	CLH	R1,SELTST	IS THE LAST SELECTED TEST DONE ?	MST05370	
0E66	4280	0DBA	538	BL	KEEP4	NO, GC SELECT NEXT TEST	MST05380	
			539	*			MST05390	
			540	*	ALL THE SELECTED TESTS ARE NOW RUN		MST05400	
			541	*			MST05410	
			542	ABORT	EQU	*	COME HERE TO ABORT TEST SEQUENCE.	MST05420
0E6A	41F0	12EE	543	BAL	LINK,TSTDU	RETURN WITH R1 = DU BIT	MST05430	
0E6E	4230	0E9A	544	BNZ	KEEP9	IF DU, DISPLAY TOTAL	MST05440	
0E72	4810	167A	545	LH	R1,WASDU1	WAS IT EVER ?	MST05450	
0E76	4230	0EE2	546	BNZ	KEEP10	YES, PRINT TOTAL, TOTERR	MST05460	
0E7A	41F0	128A	547	BAL	LINK,TSTBRK		MST05470	



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0E7E	4810	1830	548	LH	R1,CONTIN+6	IF CONTIN = 1,	MST05480	
0E82	4230	0DB0	549	BNZ	KEEP3	GO TO TEST 0	MST05490	
0E86	41F0	1334	550	BAL	LINK,SETKB	KE DEVICE = LIST DEVICE	MST05500	
0E8A	C850	1734	551	LHI	R5,ECTMSG		MST05510	
0E8E	41F0	1126	552	BAL	LINK,PRINT	'END OF TEST'	MST05520	
0E92	41F0	1D26	553	BAL	R15,RFMTCK	CHECK IF REFORMAT NECESSARY	MST05530	
0E96	4300	0AEC	554	B	OPTIN		MST05540	
			555	-----				MST05550
			556	* ROUTINE INCREMENTS,DISPLAYS & CHECKS 'TOTAL'				MST05560
			557	*				MST05570
0E9A	4010	1672	558	KEEP9	STH	R1,WASDU	SET 'WASDU' FLAG	
0E9E	4810	1676	559	LH	R1,TOTAL	INCREMENT TOTAL	MST05590	
0EA2	2611		560	AIS	R1,1		MST05600	
0EA4	4010	1676	561	STH	R1,TOTAL		MST05610	
0EA8	2421		562	KEEP91	LIS	R2,1	MST05620	
0EAA	DE20	164D	563	OC	R2,INCR	DISPLAY: INCREMENTAL MODE	MST05630	
0EAE	4800	1678	564	LH	R0,TOTERR		MST05640	
0EB2	5400		565	EXBR	R0,R0		MST05650	
0EB4	9820		566	WHR	R2,R0	DISPLAY TOTERR	MST05660	
0EB6	9401		567	EXBR	R0,R1	FORMAT FOR DISPLAY	MST05670	
0EB8	9820		568	WHR	R2,R0	DISPLAY TOTAL	MST05680	
0EBA	DE20	164C	569	OC	R2,NORM	DISPLAY: ACRMAL MODE	MST05690	
0EBE	C510	7FFF	570	CLHI	R1,X'7FFF'	TOTAL < MAX RETAINABLE ?	MST05700	
0EC2	2389		571	BNLS	HALT9		MST05710	
0EC4	4800	167A	572	LH	R0,BTESTAC	RG = CLURRENT TEST #	MST05720	
0EC8	4500	1670	573	CLH	R0,SELTST	IS IT LAST TEST ?	MST05730	
0ECC	4280	0DBA	574	BL	KEEP4	NO, GO TO NEXT TEST	MST05740	
0ED0	4300	0DB0	575	B	KEEP3	GO TO TEST 0	MST05750	
			576	*				MST05760
0ED4	C810	080F	577	HALT9	LHI	R1,X'80F0'	MST05770	
0ED8	9114		578	SLHLS	R1,4	(R1) = X'80F0'	MST05780	
0EDA	9521		579	EPSR	R2,R1	HALT PROCESSOR	MST05790	
			580	*				MST05800
			581	* WHEN EXE/RUN IS PRESSED, PRINT TCTAL & TCTERR				MST05810
			582	*				MST05820
0EDC	41F0	12EE	583	BAL	LINK,TSTDU	SEE IF LIST DEV IS ON	MST05830	
0EE0	2036		584	BNZS	HALT9	NO, HALT	MST05840	
0EE2	0700		585	KEEP10	XAR	R0,R0	MST05850	
0EE4	4000	1672	586	STH	R0,WASDU	RESET FLAG	MST05860	
0EE8	41F0	11C6	587	BAL	LINK,CRLF		MST05870	
0EEC	C850	16B0	588	LHI	R5,TCTMSG		MST05880	
0EF0	4050	166C	589	STH	R5,ISITERR		MST05890	
0EF4	41F0	1126	590	BAL	LINK,PRINT	PRINT 'TOTAL TCTERR'	MST05900	
0EF8	2404		591	LIS	R0,4	TO PRINT 4 HEX DIGITS	MST05910	
0EFA	4850	1676	592	LH	R5,TOTAL		MST05920	
0EFE	41F0	10D4	593	BAL	LINK,RSEXH	PRINT TOTAL IN HEX	MST05930	
0F02	2434		594	LIS	R3,4		MST05940	
0F04	C840	0020	595	LHI	R4,C' '	SPACE	MST05950	
0F08	41F0	11D4	596	KEEP101	BAL	LINK,OUTCHR	CUTPUT IT	
0F0C	2731		597	SIS	R3,1		MST05970	
0F0E	2023		598	BPS	KEEP101	4 TIMES	MST05980	
0F10	2404		599	LIS	R0,4	TO PRINT 4 HEX DIGITS	MST05990	
0F12	4850	1678	600	LH	R5,TOTERR		MST06000	

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

0F1E	41F0 10D4	601	BAL	LINK,RSHEX	PRINT TCERR IN HEX	MST06010
0F1A	4300 0AEC	602	B	OPTIN	GO TO BEGINNING	MST06020
		603	*	*****		MST06030
		604	*	ERROR RCUTINES	(OVERRIDE NOMSG OPTION)	MST06040
		605	*			MST06050
0F1E	D000 3EC0	606	ERR	STM R0,ERRSAVE	STORE REGISTERS	MST06060
0F22	4120 0FA8	607	BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS CN	MST06070
0F2E	41E0 0FDA	608	BAL	RET,ERR1	PRINT 'ERRCR TTNN'	MST06080
0F2A	0700	609	ERRCOM2	XAR R0,R0		MST06090
0F2C	4000 166C	610	STM	R0,ISITERR	RESET ERRCR FLAG	MST06100
0F30	4820 0A20	611	LH	R2,PSW		MST06110
0F34	9502	612	EPSR	R0,R2		MST06120
0F36	D100 3EC0	613	LM	R0,ERRSAVE	RESTORE REGISTERS	MST06130
0F3A	030F	614	BR	LINK	RETURN TO TEST	MST06140
0F3C	D000 3EC0	615	ERRD	STM R0,ERRSAVE	STORE REGISTERS	MST06150
0F40	4120 0FA8	616	BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS CN	MST06160
0F44	41E0 0FDA	617	BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06170
0F48	41E0 0FE4	618	BAL	RET,ERRD1	PRINT 'DEV CCC'	MST06180
0F4C	4300 0F2A	619	B	ERRCOM2		MST06190
0F50	D000 3EC0	620	ERRS	STM R0,ERRSAVE	STORE REGISTERS	MST06200
0F54	4120 0FA8	621	BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS CN	MST06210
0F58	41E0 0FDA	622	BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06220
0F5C	41E0 0FFC	623	BAL	RET,ERRS1	PRINT 'STA SS'	MST06230
0F60	4300 0F2A	624	B	ERRCOM2		MST06240
0F64	D000 3EC0	625	ERRDS	STM R0,ERRSAVE	STORE REGISTERS	MST06250
0F68	4120 0FA8	626	BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS CN	MST06260
0F6C	41E0 0FDA	627	BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06270
0F70	41E0 1014	628	BAL	RET,ERRDS1	PRINT 'DEV CCC STA SS'	MST06280
0F74	4300 0F2A	629	B	ERRCOM2		MST06290
0F78	D000 3EC0	630	ERRL	STM R0,ERRSAVE	STORE REGISTERS	MST06300
0F7C	40F0 1646	631	STM	R15,0LOC	STORE ERROR LOC TO PRINT	MST06310
0F80	4120 0FA8	632	BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS CN	MST06320
0F84	41E0 0FDA	633	BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06330
0F88	41E0 103A	634	BAL	RET,ERRL1	PRINT 'LOC LLLL'	MST06340
0F8C	4300 0F2A	635	B	ERRCOM2		MST06350
0F90	D000 3EC0	636	ERRALL	STM R0,ERRSAVE	STORE REGISTERS	MST06360
0F94	4120 0FA8	637	BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS CN	MST06370
0F98	41E0 0FDA	638	BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06380
0F9C	41E0 1014	639	BAL	RET,ERRDS1	PRINT 'DEV CCC STA SS'	MST06390
0FA0	41E0 1052	640	BAL	RET,ERRPL1	PRINT 'PSW PPPP LCC LLLL'	MST06400
0FA4	4300 0F2A	641	B	ERRCOM2		MST06410
		642	*			MST06420
		643	*	COMMON ERROR ROUTINE		MST06430
		644	*			MST06440
0FAB	4020 0FC2	645	ERRCOM	STM R2,COMRET		MST06450
0FAC	4810 0A22	646	LH	R1,PSW2		MST06460
0FB0	9501	647	EPSR	R0,R1	DISABLE INT. 8 PROCESSOR LEVEL	MST06470
0FB2	41F0 12EE	648	BAL	LINK,TSTDU	GET LIST DEVICE DU BIT IN R1	MST06480
0FB6	2137	649	BNZS	ERRCOM1	BRANCH IF CFF-LINE	MST06490
0FB8	4020 166C	650	STM	R2,ISITERR	SET ERROR FLAG	MST06500
0FBC	4020 166E	651	STM	R2,NOERR		MST06510
0FC0	4300 0FC0	652	B	*	60, PRINT ERROR MESSAGE	MST06520
	0000 0FC2	653	COMRET	EQU *-2		MST06530

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

DFC4	4810 1678	654	*				MST06540
DFCE	2611	655	ERRCOM1	LH	R1,TOTERR	LIST DEVICE IS OFF	MST06550
DFCA	4010 1678	656		AIS	R1,1		MST06560
DFCE	0510 7FFF	657		STH	R1,TOTERR	INCREMENT TOTERR	MST06570
DFD2	4280 0EA8	658		CLHI	R1,X'7FFF'	TOTERR < MAX RETAINABLE ?	MST06580
DFDE	4300 0EDA	659		BL	KEEP91	NO, ABCRT CURRENT TEST & GOTO NEXT	MST06590
		660		B	HALT9	YES, HALT PROCESSOR	MST06600
		661	*	-----			MST06610
		662	*	MESSAGE PRINT ROUTINES			(DC NOT OVERRIDE NOMSG OPTION)
		663	*				MST06620
		664	*	TO PRINT 'ERROR TTNN'			MST06630
		665	*				MST06640
DFDA	C850 16A4	666	ERR1	LHI	R5,ERRMSG		MST06650
DFDE	41F0 112E	667		BAL	LINK,PRINT	PRINT 'ERROR TTNN'	MST06660
		668	*				MST06670
DFE2	030E	669		BR	RET	IT = TEST #, NN = ERROR #	MST06680
		670	*				MST06690
		671	*	TO PRINT 'DEV DDD'			MST06700
		672	*				MST06710
DFE4	2403	673	ERRD1	LIS	R0,3	SET UP DIGITS = 3	MST06720
DFEE	4810 1648	674		LH	R1,ERRDEV	R1 = ERRCR DEV # IN BINARY	MST06730
DFEA	C820 16DE	675		LHI	R2,ASCIDEV2		MST06740
DFEE	41F0 10FE	676		BAL	LINK,HEXASC	CCONVERT IT TO ASCII	MST06750
DFE2	C850 16DA	677		LHI	R5,DEVMSG2		MST06760
DFE6	41F0 112E	678		BAL	LINK,PRINT	PRINT 'DEV DD'	MST06770
DFFA	030E	679		BR	RET	RETURN	MST06780
		680	*				MST06790
		681	*	TO PRINT 'STA SS'			MST06800
		682	*				MST06810
OFFC	2402	683	ERRS1	LIS	R0,2	SET UP DIGITS = 2	MST06820
OFFE	D310 164A	684		LB	R1,ERRSTA	R1 = ERROR STATUS	MST06830
1002	C820 16D6	685		LHI	R2,ASCISTA		MST06840
100E	41F0 10FE	686		BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST06850
100A	C850 16D2	687		LHI	R5,STAMSG		MST06860
100E	41F0 112E	688		BAL	LINK,PRINT	PRINT 'STA SS'	MST06870
1012	030E	689		BR	RET	RETURN	MST06880
		690	*				MST06890
		691	*	TO PRINT 'DEV DDD STA SS'			MST06900
		692	*				MST06910
1014	2403	693	ERRCS1	LIS	R0,3	SET UP DIGITS = 3	MST06920
101E	4810 1648	694		LH	R1,ERRDEV	R1 = ERRCR DEV #	MST06930
101A	C820 16CE	695		LHI	R2,ASCIDEV		MST06940
101E	41F0 10FE	696		BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST06950
1022	2402	697		LIS	R0,2	SET UP DIGITS = 2	MST06960
1024	C310 164A	698		LB	R1,ERRSTA	R1 = ERRCR STATUS	MST06970
1028	C820 16D6	699		LHI	R2,ASCISTA		MST06980
102C	41F0 10FE	700		BAL	LINK,HEXASC	CCONVERT IT TO ASCII	MST06990
1030	C850 16CA	701		LHI	R5,DEVMSG		MST07000
1034	41F0 112E	702		BAL	LINK,PRINT	PRINT 'DEV DD STA SS'	MST07010
1038	030E	703		BR	RET	RETURN	MST07020
		704	*				MST07030
		705	*	TO PRINT 'LOC LLLL'			MST07040
		706	*				MST07050
							MST07060

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

103A	2404	707	ERRL1	LIS	R0,4	SET UP DIGITS = 4	MST07070
103C	4810 164E	708		LH	R1,0LOC	R1= OLD LOC	MST07080
1040	C820 16F2	709		LHI	R2,ASCIOLOC		MST07090
1044	41F0 10FE	710		BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST07100
1048	C850 16EE	711		LHI	R5,LOCMSG		MST07110
104C	41F0 112E	712		BAL	LINK,PRINT	PRINT 'LCC LLLL'	MST07120
1050	030E	713		BR	RET	RETURN	MST07130
		714	*				MST07140
		715	*		TO PRINT 'PSW PPPP LCC LLLL'		MST07150
		716	*				MST07160
1052	2404	717	ERRPL1	LIS	R0,4	SET UP DIGITS = 4	MST07170
1054	4810 1642	718		LH	R1,OPSW	R1 = OLD PSW	MST07180
1058	C820 16E8	719		LHI	R2,ASCIPSW		MST07190
105C	41F0 10FE	720		BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST07200
1060	4810 164E	721		LH	R1,0LOC	R1= OLD LOC	MST07210
1064	C820 16F2	722		LHI	R2,ASCIOLOC		MST07220
1068	41F0 10FE	723		BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST07230
106C	C850 16E4	724		LHI	R5,PSWMSG		MST07240
1070	41F0 112E	725		BAL	LINK,PRINT	PRINT 'PSW PPPP LCC LLLL'	MST07250
1074	030E	726		BR	RET	RETURN	MST07260
		727	*		*****		MST07270
		728	*		TO OBTAIN OPTION VALUE IN R6 (16 BITS, TARGET 16)		MST07280
		729	*				MST07290
1076	076E	730	OPTVAL	XAR	R6,R6	INITIALIZE ACCUMULATOR	MST07300
1078	41F0 1248	731		BAL	R15,GETCHR	GET A CHAR IN R4	MST07310
107C	24FF	732	CPTVAL0	LIS	R15,15		MST07320
107E	D44F 168A	733	CPTVAL1	CLB	R4,HEXTAB(R15)	SCAN TABLE	MST07330
1082	2334	734		BES	OPTVAL2	MATCH	MST07340
1084	27F1	735		SIS	R15,1		MST07350
1086	2214	736		BNMS	OPTVAL1		MST07360
1088	030C	737		BR	R12	ERROR; VALUE NOT IN TABLE.	MST07370
108A	9164	738	OPTVAL2	SLLS	R6,4	SHIFT LEFT 4	MST07380
108C	066F	739		QAR	R6,R15	OR IN CURRENT DIGIT	MST07390
108E	41F0 1248	740	OPTVAL3	BAL	R15,GETCHR	GET NEXT CHAR	MST07400
1092	C540 005F	741		CLHI	R4,X'5F'	IS IT LEFT ARROW ?	MST07410
1096	2133	742		BNES	OPTVAL4		MST07420
1098	5064	743		SRLS	R6,4	THROW AWAY LAST HEX ENTRY	MST07430
109A	220E	744		BS	OPTVAL3		MST07440
109C	C540 000D	745	OPTVAL4	CLHI	R4,13	EXIT IF CR	MST07450
10A0	033E	746		BER	R14		MST07460
10A2	C540 002C	747		CLHI	R4,X'2C'	OR COMMA	MST07470
10A6	4230 107C	748		BNE	OPTVAL0	LCCP TO PROCESS	MST07480
10AA	030E	749		BR	R14	RETURN	MST07490
		750			-----		MST07500
		751	*		TO CONVERT (R6) FROM BINARY TO UNARY PATTERN, IN R3		MST07510
		752	*				MST07520
10AC	2431	753	UNARY	LIS	R3,1	INITIALIZE	MST07530
10AE	C560 000F	754	UNARY1	CLHI	R6,15	DONE ?	MST07540
10B2	033E	755		BER	R14	RETURN	MST07550
10B4	0A33	756		AAR	R3,R3	NO. SHIFT R3.	MST07560
10B6	2661	757		AIS	R6,1	INCREMENT COUNTER	MST07570
10B8	2205	758		BS	UNARY1		MST07580
		759			-----		MST07590

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

		760	*	TO PROVIDE # OF MILLISECONDS DELAY SPECIFIED BY R0		MST07600
		761	*			MST07610
108A	D000 3E00	762	TIMER	STM R0,RSAVE	SAVE REGISTERS	MST07620
108E	2410	763		LIS R1,0		MST07630
10C0	2421	764		LIS R2,1		MST07640
10C2	4830 0A1C	765		LH R3,TIME	R3 = TIME CONSTANT FOR 1 MS DELAY	MST07650
10C6	C110 10C6	766		BXLE R1,*		MST07660
10CA	2701	767		SIS R0,1		MST07670
10CC	2037	768		BNZS TIMER+4	LOOP TILL SPECIFIED DELAY	MST07680
10CE	D100 3E00	769		LM R0,RSAVE	RESTORE REGISTERS	MST07690
10D2	030F	770	TIMXT	BR LINK	RETURN	MST07700
		771	*	-----		MST07710
		772	*	RSHEX PRINTS CONTENTS CF R5 IN HEX		MST07720
		773	*	PRINTS UPTO 4 DIGITS	(8 DIGITS, TARGT 32)	MST07730
		774	*			MST07740
10D4	D000 3E00	775	RSHEX	STM R0,RSAVE	STCRE REGISTERS	MST07750
10D8	0820	776		LDAR R2,R0	R2 = # CF DIGITS TO BE PRINTED	MST07760
10DA	2721	777		SIS R2,1		MST07770
10DC	4210 10F8	778		BM R5XB		MST07780
10E0	9122	779		SLLS R2,2	R2 = 4(DIGITS-1)	MST07790
10E2	0845	780	R5X	LDAR R4,R5		MST07800
10E4	CC42 0000	781		SRAL R4,0(R2)		MST07810
10E8	C440 000F	782		NHI R4,15	R4 = HEX CIGIT	MST07820
10EC	D344 168A	783		LB R4,HEXTAB(R4)		MST07830
10F0	41F0 11D4	784	R5XA	BAL R15,CUTCHR		MST07840
10F4	2724	785		SIS R2,4		MST07850
10F6	221A	786		BNMS R5X	LOOP TILL ALL DIGITS	MST07860
10F8	C100 3E00	787	R5XB	LM R0,RSAVE	RESTORE REGISTERS	MST07870
10FC	030F	788		BR LINK	RETURN	MST07880
		789	*	-----		MST07890
		790	*	TO CONVERT HEXADECIMAL DATA IN R1 TO ASCII CHAR & STORE @ 0(R2)		MST07900
		791	*			MST07910
10FE	D000 3E00	792	HEXASC	STM R0,RSAVE	STORE REGISTERS	MST07920
1102	0830	793		LDAR R3,R0	R3 = DIGITS	MST07930
1104	9132	794		SLLS R3,2		MST07940
1106	2734	795		SIS R3,4	R3 = 4(DIGITS)-4	MST07950
1108	0841	796	HEXASC1	LDAR R4,R1	R4 = HEX DATA	MST07960
110A	CC43 0000	797		SRAL R4,0(R3)		MST07970
110E	C440 000F	798		NHI R4,15	R4 = HEX CIGIT TO BE CONVERTED	MST07980
1112	D344 168A	799		LB R4,HEXTAB(R4)		MST07990
1116	D242 0000	800		STB R4,0(R2)	STORE ASCII CHAR	MST08000
111A	2621	801		AIS R2,1		MST08010
111C	2734	802		SIS R3,4		MST08020
111E	221B	803		BNMS HEXASC1	LOOP TILL ALL DIGITS	MST08030
1120	D100 3E00	804		LM R0,RSAVE	RESTORE REGISTERS	MST08040
1124	030F	805		BR LINK	RETURN	MST08050
		806	*	-----		MST08060
		807	*	TO PRINT THE ASCII MESSAGE		MST08070
		808	*			MST08080
1126	D000 3E00	809	PRINT	STM R0,RSAVE	STORE REGISTERS	MST08090
112A	D310 3DF1	810		LB R1,IOSAVE+1	LOAD LIST IDENTIFIER	MST08100
112E	2711	811		SIS R1,1	CRT ?	MST08110
1130	2338	812		BZS P4		MST08120

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1132	2713	813	SIS	R1,3	CARCUSEL ?	MST08130
1134	213A	814	BNZS	P5		MST08140
1136	D300 0A19	815	LB	R0,C300ADR+1		MST08150
113A	DE00 1660	816	OC	R0,CAR2ND		MST08160
113E	2305	817	BS	P5		MST08170
1140	E300 0A13	818	P4 LB	R0,PASLADR+1		MST08180
1144	DE00 165E	819	OC	R0,CRT2ND		MST08190
1148	41F0 12EE	820	P5 BAL	LINK,TSTDU		MST08200
114C	2335	821	EZS	P1		MST08210
114E	4010 1672	822	STH	R1,WASDU	SET FLAG	MST08220
1152	4300 118C	823	E	PRINT5	EXIT	MST08230
1156	4820 1672	824	P1 LH	R2,WASDU		MST08240
115A	4330 1188	825	BZ	P3		MST08250
115E	C810 0140	826	LHI	R1,X*140*	DELAY CONSTANT	MST08260
1162	C800 1000	827	LHI	R0,X*1000*		MST08270
1166	2701	828	SIS	R0,1		MST08280
1168	2031	829	BTBS	3,1		MST08290
116A	2711	830	SIS	R1,1		MST08300
116C	2035	831	BTBS	3,5	LOOP TILL TIMECUT	MST08310
116E	0744	832	XAR	R4,R4		MST08320
1170	4040 1672	833	STH	R4,WASDU		MST08330
1174	2541	834	LCS	R4,1	CHARACTER = X'FF'	MST08340
1176	4040 1674	835	STH	R4,WASDU1		MST08350
117A	2434	836	LIS	R3,4		MST08360
117C	41F0 11D4	837	P2 BAL	LINK,OUTCHR		MST08370
1180	2731	838	SIS	R3,1		MST08380
1182	2023	839	BPS	P2		MST08390
1184	4300 0EE2	840	B	KEEP10	PRINT TOTAL, TOTERR	MST08400
		841	*			MST08410
1188	4800 166C	842	P3 LH	R0,ISITERR		** MST08420
118C	4500 183C	843	CLH	R0,NOMSG+6	SHOULD MESSAGE BE SUPPRESSED ?	** MST08430
1190	4280 118C	844	BL	PRINT5	BRANCH: YES.	** MST08440
		845	*			MST08450
1194	D345 0000	846	PRINT2 LB	R4,0(R5)	GET A MESSAGE BYTE	MST08460
1198	41F0 11D4	847	BAL	LINK,OUTCHR	OUTPUT IT	MST08470
119C	274D	848	SIS	R4,13	CR ?	MST08480
119E	2333	849	BZS	PRINT3	MSG OVER	MST08490
11A0	2651	850	AIS	R5,1		MST08500
11A2	2207	851	BS	PRINT2	LOOP FOR NEXT CHAR	MST08510
11A4	244A	852	PRINT3 LIS	R4,10	LF	MST08520
11A6	D310 3DF1	853	LB	R1,IOSAVE+1	GET LIST DEV IDENTIFIER	MST08530
11AA	2713	854	SIS	R1,3	LINE PRINTER ?	MST08540
11AC	2335	855	BZS	PRINT3A	BRANCH IF YES.	MST08550
11AE	41F0 11D4	856	BAL	LINK,OUTCHR	LF	MST08560
11B2	2541	857	LCS	R4,1	DEL	MST08570
11B4	2302	858	BS	PRINT3B		MST08580
11B6	2441	859	PRINT3A LIS	R4,1	YES, OUTPUT X'01'	MST08590
11B8	41F0 11D4	860	PRINT3B BAL	LINK,OUTCHR	TERMINAL CHARACTER	MST08600
11BC	41F0 128A	861	PRINT5 BAL	LINK,TSTBRK		MST08610
11C0	D100 3E00	862	LM	R0,RSAVE	RESTORE REGISTERS	MST08620
11C4	030F	863	BR	LINK	RETURN	MST08630
		864	-----			MST08640
		865	* SMALL SUPPORT ROUTINES			MST08650

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		866	*				MST08660
		867	*	TO OUTPUT CR,LF TO LIST DEVICE			MST08670
		868	*				MST08680
11CE	C000 3E00	869	CRLF	STM	R0,RSAVE	STORE REGISTERS	MST08690
11CA	2440	870		LIS	R4,13		MST08700
11CC	41F0 11D4	871		BAL	LINK,OUTCHR	OUTPUT CR	MST08710
11D0	4300 11A4	872		B	PRINT3	LINE FEED, RESTORE, RETURN	MST08720
		873		*-----*			MST08730
		874	*	TO OUTPUT A CHARACTER TO THE LIST DEVICE			MST08740
11D4	40F0 1244	875	OUTCHR	STH	R15,OUT1+2	SAVE RETURN ADDRESS	MST08750
11D8	D300 3DF1	876		LB	R0,IOSAVE+1		MST08760
11DC	2704	877		SIS	R0,4		MST08770
11DE	4230 121C	878		BNZ	OUTCHR2	BRANCH IF NO TRANS PAUSE	MST08780
11E2	4000 1246	879		STH	R0,PAUSE	RESET FLAG	MST08790
11E6	41F0 12EE	880	OTC.0	BAL	LINK,TSTDU	ON-LINE ?	MST08800
11EA	4230 123E	881		BNZ	OUT0	BRANCH IF NO.	MST08810
11EE	5D01	882		SSR	R0,R1	CHARACTER TO READ ?	MST08820
11F0	2386	883		BFFS	8,OTC.2	BRANCH IF YES	MST08830
11F2	4810 1246	884	OTC.1	LH	R1,PAUSE	PAUSED NOW ?	MST08840
11F6	2038	885		BNZS	OTC.0	BRANCH: YES, WAIT FOR DC2	MST08850
11F8	4300 121C	886		B	OUTCHR2	PRESS ON	MST08860
11FC	9801	887	OTC.2	RDR	R0,R1	DC2, DC4 (FDX ONLY) ?	MST08870
11FE	C410 007F	888		NHI	R1,X'7F'		MST08880
1202	CB10 0012	889		SHI	R1,X'12'	DC2 ?	MST08890
1206	2134	890		BNZS	OTC.3		MST08900
1208	4010 1246	891		STH	R1,PAUSE	RESET FLAG	MST08910
120C	2308	892		BS	OUTCHR2	PRESS ON	MST08920
120E	2712	893	OTC.3	SIS	R1,2	DC4 ?	MST08930
1210	4230 11E6	894		BNZ	OTC.0	NO.	MST08940
1214	40F0 1246	895		STH	LINK,PAUSE	SET FLAG	MST08950
1218	4300 11E6	896		B	OTC.0	AND WAIT FOR DC2	MST08960
121C	41F0 12EE	897	OUTCHR2	BAL	LINK,TSTDU	OFF-LINE ?	MST08970
1220	213F	898		BNZS	OUT0	IF YES.	MST08980
1222	4110 137A	899		BAL	R1,SETUP	SET UP FOR OUTPUT	MST08990
1226	9D01	900	OTC.4	SSR	R0,R1	WAIT FOR NOT BUSY	MST09000
1228	213B	901		BTFS	3,OUT0	BRANCH IF OFF-LINE	MST09010
122A	C510 000C	902		CLHI	R1,12	PASLA OFFLINE ?	MST09020
122E	2338	903		BES	OUT0	BRANCH: YES.	MST09030
1230	C310 0008	904		THI	R1,8	EUSY ?	MST09040
1234	2037	905		BNZS	OTC.4	WAIT FOR NOT BUSY.	MST09050
1236	9A04	906		WDR	R0,R4	OUTPUT DATA BYTE	MST09060
1238	5D01	907		SSR	R0,R1		MST09070
123A	2081	908		BTBS	8,1	WAIT FOR NOT BUSY.	MST09080
123C	2303	909		BS	OUT1		MST09090
123E	4010 1672	910	CUTO	STH	R1,WASDU	SET FLAG	MST09100
1242	4300 1242	911	OUT1	B	*	RETURN AS SET UP ABOVE	MST09110
1246	0000	912	PAUSE	DCX	0	SET DURING TRANSMISSION PAUSE	MST09120
		913		*-----*			MST09130
		914	*	TO GET A CHAR FROM KEYBOARD (IN REG R4)			MST09140
		915	*				MST09150
1248	4140 1342	916	GETCHR	BAL	R4,KBREAD	PUT KB DEVICE IN READ MODE	MST09160
124C	9D04	917		SSR	R0,R4		MST09170
124E	021F	918		ETCR	1,LINK	IF CU, RETURN	MST09180

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1250	2082	519	BTBS	8,2	IF BUSY, LOOP	MST09190
1252	5B04	920	RDR	R0,R4	READ A CHAR IN R4	MST09200
		921	* TO ECHO RECEIVED CHARACTERS TO CONSOLE DEVICE IN FDX MODE			MST09210
1254	D390 1652	922	ECHO	LB R9,CONRD		MST09220
1258	C590 00A9	923	CLHI	R9,X'A9'	CARCUSEL ?	MST09230
125C	2137	924	BNES	ECHRTN	DO NOT ECHO	MST09240
125E	D390 1651	925	LB	R9,CONADR+1		MST09250
1262	DD50 164B	926	SS	R9,SINK		MST09260
1266	2082	927	BTBS	8,2		MST09270
1268	9A94	928	LDR	R9,R4	ECHO RECEIVED BYTE	MST09280
126A	C440 007F	929	ECHRTN	NHI R4,X'7F'	REMOVE PARITY BIT	MST09290
126E	030F	930	BR	LINK	RETURN	MST09300
		931	-----			MST09310
		932	* TO OUTPUT '?' TO CONSOLE			MST09320
		933	*			MST09330
1270	41F0 11C6	934	QUESTN	BAL LINK,CRLF		MST09340
1274	40F0 166C	935	STH	LINK,ISITERR	SET FLAG	MST09350
1278	C850 1742	936	LHI	R5,QMSG		MST09360
127C	41F0 1126	937	BAL	LINK,PRINT	PRINT '?'	MST09370
1280	0700	938	XAR	R0,R0		MST09380
1282	4000 166C	939	STH	R0,ISITERR		MST09390
128E	4300 0AF0	940	B	OPTIN1	TO ACCEPT COMMAND INPUT	MST09400
		941	-----			MST09410
		942	* IF BREAK KEY DEPRESSED, GO TO 'OPTIN' OR (BRKVECT); ELSE RETURN.			MST09420
		943	*			MST09430
128A	D000 3E40	944	TSTBRK	STM R0,RSAVE+64	STORE REGISTERS	MST09440
128E	40F0 12EC	945	STH	LINK,BRKRTN		MST09450
1292	C300 1650	946	LB	R0,CONADR	GET KEYBOARD DEVICE ADR	MST09460
1296	5D01	947	SSR	R0,R1		MST09470
1298	C310 0020	948	THI	R1,X'20'	'BREAK' KEY PRESSED ?	MST09480
129C	4330 12E0	949	BZ	TSTBRK3	NO. EXIT	MST09490
12A0	4820 164E	950	LH	R2,PASFL6	PASLA ?	MST09500
12A4	233C	951	BZS	TSTBRK1	BRANCH IF NO.	MST09510
12A6	C310 0008	952	THI	R1,8	ALREADY ACKNOWLEDGED ?	MST09520
12AA	4230 12E0	953	BNZ	TSTBRK3	BRANCH IF YES	MST09530
12AE	9B02	954	RDR	R0,R2		MST09540
12B0	9D01	955	SSR	R0,R1		MST09550
12B2	2281	956	BFBS	8,1		MST09560
12B4	0822	957	LDAR	R2,R2	ZERO CHARACTER ?	MST09570
12B6	4230 12E0	958	BNZ	TSTBRK3	BRANCH: JUST FRAMING ERROR	MST09580
12BA	2305	959	BS	TSTBRK2		MST09590
12BC	9D01	960	TSTBRK1	SSR R0,R1		MST09600
12BE	C310 0020	961	THI	R1,X'20'		MST09610
12C2	2033	962	BTBS	3,3	WAIT FOR BREAK KEY RELEASE	MST09620
12C4	48F0 166A	963	TSTBRK2	LH R15,BRKVECT	CHECK FOR SPECIAL ROUTINE	MST09630
12C8	213A	964	BNZS	TBRK2.5	BRANCH: USE VECTOR	** MST09640
12CA	4810 0A22	965	LH	R1,PSW2	ELSE, ABORT.	** MST09650
12CE	9501	966	EPSR	R0,R1	.	** MST09660
12D0	C850 1726	967	LHI	R5,ABTMSG	.	** MST09670
12D4	41F0 1126	968	BAL	R15,PRINT	'* ABORTED *'	** MST09680
12D8	4300 0AEC	969	B	OPTIN	TO EXEC.	** MST09690
12DC	40F0 12EC	970	TBRK2.5	STH R15,BRKRTN	SET UP FOR EXIT	** MST09700
12E0	2400	971	TSTBRK3	LIS R0,0		MST09710



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12E2	4000 166A	972	STH	R0,BRKVECT	DELETE VECTOR AFTER ONE S-CT.	MST09720
12E6	D100 3E40	973	LM	R0,RSRVE+64	RESTORE REGISTERS	MST09730
12EA	4300 12EA	974	B	*	RETURN TO PROGRAM	MST09740
	0000 12EC	975	BRKRTN	EQU	*-2	MST09750
		976	*-----*			MST09760
		977	* SEE IF LIST DEVICE OFF-LINE (R1, CC NON-ZERO IF OFF)			MST09770
		978	*			MST09780
12EE	D310 3DF1	979	TSTDU	LB R1,IOSAVE+1	GET LIST DEV IDENTIFIER	MST09790
12F2	2711	980		SIS R1,1	CRT/PASLA ?	MST09800
12F4	213D	981		BNZS TSTDU1	BRANCH IF NO.	MST09810
12F6	D300 0A12	982		LB R0,PASLADR		MST09820
12FA	9D01	983	TSTDU0	SSR R0,R1		MST09830
12FC	C410 00FC	984		NHI R1,X'FC'		MST09840
1300	C510 000C	985		CLHI R1,12	BSY & EX SET ?	MST09850
1304	2133	986		BTFS 3,3	BRANCH IF NOT OFF-LINE	MST09860
1306	0811	987		LDAR R1,R1	SET CONDITION CODE	MST09870
1308	030F	988		BR LINK	DEVICE OFF-LINE	MST09880
130A	0711	989		XAR R1,R1		MST09890
130C	030F	990		BR LINK	RETURN	MST09900
130E	D300 0A14	991	TSTDU1	LB R0,CLIFACR		MST09910
1312	2711	992		SIS R1,1	CURRENT LOOP ?	MST09920
1314	233C	993		BZS TSTDU2	BRANCH IF YES.	MST09930
1316	C300 0A16	994		LB R0,LPADR		MST09940
131A	2711	995		SIS R1,1	LP ?	MST09950
131C	2338	996		BZS TSTDU2	BRANCH IF YES.	MST09960
131E	D300 0A18	997		LB R0,C300ADR		MST09970
1322	2711	998		SIS R1,1	CAROUSEL 300 ?	MST09980
1324	4330 12FA	999		BZ TSTDU0	BRANCH IF YES.	MST09990
1328	4200 1328	1000		NOP *	PROVISION FOR SPECIAL DEVICE	MST10000
132C	9D01	1001	TSTDU2	SSR R0,R1	GET STATUS IN R1	MST10010
132E	C410 0001	1002		NHI R1,1	R1 = DU BIT	MST10020
1332	030F	1003		BR LINK	RETURN	MST10030
		1004	*-----*			MST10040
		1005	* TO DIRECT INPUT AND OUTPUT TO CONSOLE DEVICE			MST10050
		1006	*			MST10060
1334	D300 0A10	1007	SETKB	LB R0,IO	GET KEYBOARD DEVICE	MST10070
1338	9410	1008		EXBR R1,R0		MST10080
133A	0610	1009		OAR R1,R0		MST10090
133C	4010 3DF0	1010		STH R1,IOSAVE	KE DEVICE = LIST DEVICE	MST10100
1340	030F	1011		BR LINK	RETURN	MST10110
		1012	*-----*			MST10120
		1013	* TO PUT KEYBOARD DEVICE IN READ MODE			MST10130
		1014	*			MST10140
1342	D300 1650	1015	KBREAD	LB R0,CONADR		MST10150
134E	DE00 1652	1016		CC R0,CONRC		MST10160
134A	4890 164E	1017		LH R9,PASFLG	PASLA ?	MST10170
134E	4200 134E	1018		NOP *	FCR SPECIAL KE DEVICE	MST10180
1352	0334	1019	TTYGET	EZR R4	RETURN	MST10190
1354	D800 1648	1020	CRTGET	RD R0,SINK	DUMMY READ	MST10200
1358	DE00 165C	1021		OC R0,CONRQ2S		MST10210
135C	0304	1022		BR R4	RETURN	MST10220
		1023	*-----*			MST10230
		1024	* TO SET UP KEYBOARD DEV TO READ WITH INT ENABLED			MST10240

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			1025	*					MST10250
135E	0000	3E00	1026	KBRD	STM	R0,RSAVE	SAVE REGISTERS		MST10260
1362	C300	1650	1027		LB	R0,CONADR	GET KE DEV ACR		MST10270
136E	4810	164E	1028		LH	R1,PASFLG	PASLA ?		MST10280
136A	2333		1029		BZS	KBRD1			MST10290
136C	DE00	165C	1030		OC	R0,CONRQ2S			MST10300
1370	DE00	1655	1031	KBRD1	OC	R0,CONENRD	CCRSOLE : ENABLE, READ		MST10310
1374	D100	3E00	1032		LM	R0,RSAVE	RESTORE REGISTERS		MST10320
1378	030F		1033		BR	LINK	RETURN		MST10330
			1034	*					MST10340
			1035	*					MST10350
			1036	*					MST10360
137A	D300	3DF1	1037	SETUP	LB	R0,IOSAVE+1	GET LIST DEV IDENTIFIER		MST10370
137E	2701		1038		SIS	R0,1	PASLA ?		MST10380
1380	233F		1039		BZS	CRTDRV	YES, GO TO CRT DRIVER		MST10390
1382	2701		1040		SIS	R0,1	CURRENT LOOP ?		MST10400
1384	2338		1041		BZS	TTYDRV	YES, GO TO TTY DRIVER		MST10410
138E	2701		1042		SIS	R0,1	LINE PRINTER ?		MST10420
1388	233E		1043		BZS	LPDRV			MST10430
138A	2701		1044		SIS	R0,1	CARCUSEL 300 ?		MST10440
138C	4330	13AE	1045		BZ	CARDRV			MST10450
1390	4200	1390	1046		NOP	*	PROVISION TO ADD SPECIAL DEV		MST10460
1394	C300	0A15	1047	TTYDRV	LB	R0,CLIFADR+1			MST10470
1398	DE00	1665	1048		OC	R0,CLIFWRT	WRITE COMMAND TO CURR. LP. INTERF.		MST10480
139C	0301		1049		BR	R1	RETURN		MST10490
139E	C300	0A13	1050	CRTDRV	LB	R0,PASLADR+1			MST10500
13A2	2308		1051		BS	CONDRV			MST10510
13A4	C300	0A16	1052	LPDRV	LB	R0,LPADR			MST10520
13A8	DE00	1662	1053		OC	R0,LPWRT	COMMAND TO LINE PRINTER		MST10530
13AC	0301		1054		BR	R1	RETURN		MST10540
13AE	D300	0A19	1055	CARDRV	LB	R0,C300ADR+1			MST10550
13B2	DE00	1659	1056	CONDRV	OC	R0,CARWRT			MST10560
13B6	0301		1057		BR	R1	RETURN		MST10570
			1058	*					MST10580
			1059	*					MST10590
			1060	*					MST10600
13B8	0711		1061	LCORE	XAR	R1,R1			MST10610
13BA	2422		1062		LIS	R2,2			MST10620
13BC	C830	004E	1063		LHI	R3,X*4E*			MST10630
13C0	0700		1064		XAR	R0,R0			MST10640
13C2	4001	0000	1065	ZER01	STH	R0,0(R1)	ZERO CORE FROM 0 THRU X*4F*		MST10650
13C6	C110	13C2	1066		BXLE	R1,ZER01			MST10660
13CA	C810	0080	1067		LHI	R1,X*80*			MST10670
13CE	C830	00CE	1068		LHI	R3,X*CE*			MST10680
13D2	4200	13D2	1069	ZER02	NOP	*			MST10690
13D6	C110	13D2	1070		BXLE	R1,ZER02	ZERO CORE FROM X*80* THRU X*CF*	**	MST10700
13DA	C800	14CE	1071		LHI	R0,XI32	INTERRUPT HANDLER ROUTINE		MST10710
13DE	C830	08CE	1072		LHI	R3,X*8CE*			MST10720
13E2	4001	0000	1073	ZER03	STH	R0,0(R1)			MST10730
13E6	C110	13E2	1074		BXLE	R1,ZER03	SET UP INT SERVICE POINTER TABLE		MST10740
13EA	C830	15D4	1075		LHI	R3,II			MST10750
13EE	4030	0036	1076		STH	R3,X*36*	ILL INST INT NEW PSM LOC		MST10760
13F2	C840	15EE	1077		LHI	R4,MM			MST10770

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13F6	4040 003E	1078	STH	R4,X*3E'	M. M. INT NEW PSW LOC	MST10780	
13FA	C830 15A0	1079	LHI	R3,AF		MST10790	
13FE	4030 004E	1080	STH	R3,X*4E'	ARITHMETIC FAULT NEW PSW LOC(32-BIT)	MST10800	
		1081	*		FIXED PT DIVICE FAULT NEW PSW LOC	MST10810	
1402	C840 3E00	1082	LHI	R4,RSAVE		MST10820	
1406		1083	IFZ	ADC-2		MST10830	
140E	4810 1636	1084	LH	R1,MOD32		MST10840	
140A	4230 142C	1085	BNZ	LCORE32		MST10850	
		1086	*			MST10860	
		1087	*	SET UP LOW CORE FOR 16 BIT MACHINE		MST10870	
		1088	*			MST10880	
140E	4040 0022	1089	STH	R4,X*22'	REG SAVE POINTER	MST10890	
1412	C830 158E	1090	LHI	R3,FP		MST10900	
1416	4030 002E	1091	STH	R3,X*2E'	FLCATING PT FAULT INT NEW PSW LOC	MST10910	
141A	4850 0A22	1092	LH	R5,PSW2		MST10920	
141E	4050 0044	1093	STH	R5,X*44'	HL EXT INT NEW PSW STATUS	MST10930	
1422	C850 14C0	1094	LHI	R5,XI16		MST10940	
1426	4050 0046	1095	STH	R5,X*46'	EXT INT NEW PSW LOC	MST10950	
142A	030F	1096	BR	LINK		MST10960	
		1097	ENDC			MST10970	
		1098	*			MST10980	
		1099	*	SET UP LOW CORE FOR 32 BIT MACHINE		MST10990	
		1100	*			MST11000	
142C	4040 0086	1101	LCORE32	STH	R4,X*86'	REG SAVE POINTER	MST11010
1430	C840 30F8	1102	LHI	R4,PSWSAVE	PPF PSW SAVE AREA	MST11020	
1434	4040 0084	1103	STH	R4,X*84'	POINTER	MST11030	
1438	C830 1596	1104	LHI	R3,RP		MST11040	
143C	4030 0096	1105	STH	R3,X*96'	RELOC/PROTECT INT NEW PSW LOC	MST11050	
1440	D310 1650	1106	LB	R1,CONADR	LCAD CCNACLE I/O ADDRESS	MST11060	
1444	0A11	1107	AAR	R1,R1		MST11070	
1446	C800 1464	1108	LHI	R0,KBINT0	R0 = A(KEYBOARD INT HANDLER)	MST11080	
144A	4001 00D0	1109	STH	R0,X*DO*(R1)	STORE & X*DO*+2(KB DEV ADR)	MST11090	
144E	0711	1110	XAR	R1,R1	TC SET UP SERVICE POINTER TABLE	MST11100	
1450	C830 14CE	1111	LHI	R3,XI32		MST11110	
1454	4821 1898	1112	LCORE32A	LH	R2,DEVSADR(R1)	GET DEV ADR FROM TABLE	MST11120
1458	021F	1113	BMR	LINK	CCNE. RETURN	MST11130	
145A	0A22	1114	AAR	R2,R2		MST11140	
145C	4032 00D0	1115	STH	R3,X*DO*(R2)	STORE & X*DO*+2(DEV ADR)	MST11150	
1460	2612	1116	AIS	R1,2		MST11160	
1462	2207	1117	BS	LCORE32A		MST11170	
		1118	-----			MST11180	
		1119	*	KEYBCARD INTERRUPT HANDLER		MST11190	
		1120	*			MST11200	
1464	C330 0020	1121	KBINT0	THI	R3,X*20'	IS BREAK KEY DEPRESSED ?	MST11210
1468	4330 148C	1122	BZ	KBINT1	NC	MST11220	
146C	4850 164E	1123	LH	R5,PASFLG	CCNSOLE ON PASLA ?	MST11230	
1470	2339	1124	BZS	KBINT0A	BRANCH IF NO.	MST11240	
1472	5B24	1125	RDR	R2,R4		MST11250	
1474	5023	1126	SSR	R2,R3		MST11260	
1476	2281	1127	BFBS	B,1		MST11270	
1478	0844	1128	LDAR	R4,R4		MST11280	
147A	4230 14AE	1129	BNZ	RETOPSW	IGNORE FRERR ONLY	MST11290	
147E	4300 0AEC	1130	KBINT00	B	OPTIN	MST11300	

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1482	9D23	1131	KBINT0A	SSR	R2,R3		MST11310
1484	C330 0020	1132		THI	R3,X*20'		MST11320
148E	2033	1133		BTBS	3,3	WAIT FOR BREAK KEY RLS	MST11330
148A	2206	1134		BS	KBINT00	C TO COMMAND MODE	MST11340
148C	4020 1648	1135	KBINT1	STH	R2,INTDEV		MST11350
1490	C230 164A	1136		STB	R3,INTSTA		MST11360
1494		1137		IFZ	ADC-2		MST11370
1494	4840 1636	1138		LH	R4,MOD32		MST11380
1498	2335	1139		BZS	KBINT2		MST11390
		1140		ENDC			MST11400
149A	4000 1642	1141		STH	R0,OPSW	STORE OLD PSW OF 32-BIT PROCESSOR	MST11410
149E	4010 1646	1142		STH	R1,0LOC	IN ORDER TO RETURN BACK TO TEST	MST11420
14A2	9B24	1143	KBINT2	RDR	R2,R4		MST11430
14A4	41F0 1254	1144		BAL	LINK,ECHO	ECHO RECEIVED BYTE	MST11440
14A8	4890 1668	1145		LH	R9,KBINT	IF ZERO,IGNORE; ELSE	MST11450
14AC	0239	1146		BNZR	R9	GC,PROCESS KB INT FURTHER	MST11460
		1147		*	-----		MST11470
		1148		*	TO RETURN ON OLD PSW		MST11480
		1149		*			MST11490
	0000 14AE	1150	RETOPSW	EGU	*		MST11500
14AE		1151		IFZ	ADC-2		MST11510
14AE	4890 1636	1152		LH	R9,MOD32		MST11520
14B2	2135	1153		BNZS	RETOPSW1		MST11530
14B4	D100 3E80	1154		LM	R0,INTSAV	RESTORE REGISTERS	MST11540
14B8	C200 0040	1155		LPSW	X'40'	RETURN ON OLD PSW AFTER KE INT	MST11550
		1156		ENDC			MST11560
14BC	C200 1640	1157	RETOPSW1	LPSW	OPSW32		MST11570
		1158		*	*****		MST11580
		1159		*	EXTERNAL INTERRUPT HANDLER		MST11590
14C0		1160		IFZ	ADC-2		MST11600
14C0	D000 3E80	1161	XI16	STM	R0,INTSAV	FOR 16-BIT PROCESSOR	MST11610
14C4	9F23	1162		ACKR	R2,R3	ACKNOWLEDGE THE INTERRUPT	MST11620
14C6	D420 1650	1163		CLB	R2,CONADR	FROM KEYBOARD DEVICE ?	MST11630
14CA	4330 1464	1164		BE	KBINT0		MST11640
		1165		ENDC			MST11650
		1166		*			MST11660
	0000 14CE	1167	XI32	EGU	*	FOR 32-BIT PROCESSOR	MST11670
14CE	95AA	1168		EPSR	R10,R10	CAPTURE CURRENT PSW	MST11680
14D0	40A0 1638	1169		STH	R10,INTPSW		MST11690
14D4	4020 1648	1170		STH	R2,INTDEV	STORE INTERRUPTING DEVICE ADDRESS	MST11700
14D8	D230 164A	1171		STB	R3,INTSTA	STORE INTERRUPTING DEVICE STATUS	MST11710
14DC		1172		IFZ	ADC-2		MST11720
14DC	4850 1636	1173		LH	R5,MOD32		MST11730
14E0	2135	1174		BNZS	XI32A		MST11740
14E2	4800 0040	1175		LH	R0,X'40'	16-BIT OLD PSW	MST11750
14E6	4810 0042	1176		LH	R1,X'42'		MST11760
		1177		ENDC			MST11770
14EA	4000 1642	1178	XI32A	STH	R0,OPSW	STORE OLD PSW STATUS	MST11780
14EE	4010 1646	1179		STH	R1,0LOC	STORE OLD PSW LOC	MST11790
14F2		1180		IFZ	ADC-2		MST11800
14F2	0855	1181		LDAR	R5,R5	MOD32 = 0 ?	MST11810
14F4	233A	1182		BZS	XI16A	BRANCH IF YES.	MST11820
		1183		ENDC			MST11830

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14FE	4820 0A22	1184	LH	R2,PSW2		MST11840
14FA	9512	1185	EPSR	R1,R2	SELECT USER REGISTER SET	MST11850
14FC	D000 3E80	1186	STP	RO,INTSAV	SAVE USER REGISTERS	MST11860
1500	4820 1648	1187	LH	R2,INTDEV		MST11870
1504	48A0 1638	1188	LH	R10,INTPSW		MST11880
		1189	*			MST11890
1508	0755	1190	XI16A	XAR	R5,R5	MST11900
150A	4865 1898	1191	XI1	LH	R6,DEVSADR(R5)	MST11910
150E	4210 155A	1192		BM	XIERR	GET DEV ADRS FROM TABLE
1512	0562	1193		CLAR	R6,R2	TAELE OVERFLW.
1514	2333	1194		BES	XI2	COMPARE INTERRUPTING DEVICE ADDRESS
1516	2652	1195		AIS	R5,2	MST11930
1518	2207	1196		BS	XI1	MST11940
151A	4865 18A6	1197	XI2	LH	R6,DEVINT(R5)	MST11950
151E	4330 155A	1198		BZ	XIERR	GET INTERRUPT HANDLER ADDRESS
1522	4060 1558	1199		STH	R6,XIEXIT	INTERRUPT NOT EXPECTED
		1200	*			MST11980
1526		1201		IFZ	ADC-2	MST11990
152E	4860 1636	1202		LH	R6,MOD32	MST12000
152A	2339	1203		BZS	XI3	32-BIT MACHINE ?
		1204		ENDC		BRANCH IF NO.
152C	9051	1205		SRLS	R5,1	MST12030
152E	90A4	1206		SRLS	R10,4	MST12040
1530	C4A0 000F	1207		NHI	R10,15	MST12050
1534	D4A5 18B2	1208		CLB	R10,INTLVL(R5)	MST12060
1538	4230 156A	1209		ENE	LVLERR	CHECK PROPER INTERRUPT LEVEL
		1210	*			MST12070
153C	4860 1646	1211	XI3	LH	R6,0LOC	MST12080
1540	C560 10BE	1212		CLHI	R6,TIMER+4	GET PSW AT TIME OF INTERRUPT
1544	2187	1213		BLS	XI4	MST12110
1546	C560 10D2	1214		CLHI	R6,TIMXT	WAS INTERRUPT IN TIMER ROUTINE ?
154A	2384	1215		BNLS	XI4	MST12130
154C	D100 3E00	1216		LM	RO,RSAVE	BRANCH IF NO.
1550	2303	1217		BS	XI5	RESTORE FROM 'TIMER' ENTRY
1552	D100 3E80	1218	XI4	LM	RO,INTSAV	MST12150
1556	4300 1556	1219	XI5	B	*	RESTORE FROM XI16/XI32 ENTRY
	0000 1558	1220	XIEXIT	EQU	*-2	AND GO TO INTERRUPT HANDLER
		1221	*			MST12180
		1222	*			MST12190
		1223	*			MST12200
155A	C860 4634	1224	XIERR	LHI	R6,C'F4'	EXTERNAL INTERRUPT ERROR ROUTINE
155E	4060 16AC	1225		STH	R6,ERRNO	ERROR # F4
1562	41F0 0F90	1226		BAL	LINK,ERRALL	'ERROR XXF4', 'DEV DDC STA SS'
		1227	*			'PSW PPPP LCC LLLL'
1564	4300 0AF0	1228		B	OPTIN1	TC ENTER COMMAND MODE
		1229	*			MST12240
		1230	*			MST12250
		1231	*			MST12260
156A	C860 4636	1232	LVLERR	LHI	R6,C'F6'	'PSW PPPP LCC LLLL'
156E	4060 16AC	1233		STH	R6,ERRNO	TC ENTER COMMAND MODE
1572	D3AA 168A	1234		LB	R10,HEXTAB(R10)	MST12280
1576	D2A0 170E	1235		STB	R10,ERRLVL	MST12290
157A	41F0 0F90	1236		BAL	LINK,ERRALL	* DEVICE INTERRUPTED IN WRONG INTERRUPT LEVEL
						MST12300
						MST12310
						MST12320
						MST12330
						MST12340
						MST12350
						MST12360

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		1237	*			'PSW PPPP LCC LLLL'	MST12370
157E	C850 16F8	1238		LHI	R5,INTLVLM		MST12380
1582	4050 166C	1239		STH	R5,ISITERR	SET FLAG TO OVERRIDE NOMSG OPTION	MST12390
1586	41F0 1126	1240		BAL	LINK,PRINT	'INTERRUPTED IN LEVEL N'	MST12400
158A	4300 0AF0	1241		B	OPTIN1	ENTER COMMAND MODE.	MST12410
		1242	*	-----			MST12420
		1243	*	SPURIOUS INTERRUPT HANDLERS			MST12430
158E		1244		IFZ	ADC-2		MST12440
		1245	*	FLOATING-PT ARITH FAULT INT TRAP (16 BIT PROCESSOR)			MST12450
		1246	*				MST12460
158E	48E0 0028	1247	FP	LH	R14,X'28'	OLD PSW (16-BIT PROCESSOR)	MST12470
1592	48F0 002A	1248		LH	R15,X'2A'	CLD LOC	MST12480
		1249		ENDC			MST12490
		1250	*				MST12500
		1251	*	RELOCATION/PROTECTION INT TRAP			MST12510
		1252	*				MST12520
1596	C820 4635	1253	RP	LHI	R2,C'F5'		MST12530
159A	4020 16AC	1254		STH	R2,ERRNO	SET ERROR # F5	MST12540
159E	230C	1255		BS	COMM		MST12550
		1256	*				MST12560
		1257	*	ARITHMETIC FAULT INT (32-BIT PROCESSOR) TRAP			MST12570
15A0		1258		IFZ	ADC-2		MST12580
		1259	*	FIXED-PT DIVIDE FAULT INT (16-BIT PROCESSOR) TRAP			MST12590
		1260		ENDC			MST12600
		1261	*				MST12610
15A0	C820 4631	1262	AF	LHI	R2,C'F1'		MST12620
15A4	4020 16AC	1263		STH	R2,ERRNO	SET ERROR # F1	MST12630
15A8		1264		IFZ	ADC-2		MST12640
15A8	4820 1636	1265		LH	R2,MOD32		MST12650
15AC	2135	1266		BNZS	COMM		MST12660
15AE	48E0 0048	1267		LH	R14,X'48'	OLD PSW (16-BIT PROCESSOR)	MST12670
15B2	48F0 004A	1268		LH	R15,X'4A'	CLD LOC (16-BIT PROCESSOR)	MST12680
		1269		ENDC			MST12690
15B6	40E0 1642	1270	COMM	STH	R14,OPSW		MST12700
15BA	40F0 1646	1271		STH	R15,OLOC		MST12710
15BE	4800 0A22	1272	COMM1	LH	R0,PSW2		MST12720
15C2	9520	1273		EPSR	R2,R0	NO INT. , REG SET 15	MST12730
15C4	41F0 0F1E	1274		BAL	LINK,ERR	PRINT 'ERROR XXFN'	MST12740
15C8	40F0 166C	1275		STH	LINK,ISITERR	FORCE PRINT	MST12750
15CC	41E0 1052	1276		BAL	RET,ERRPL1	PRINT 'PSW PPPP LCC LLLL'	MST12760
15D0	4300 0AF0	1277		B	OPTIN1	ENTER COMMAND MODE	MST12770
		1278	*				MST12780
		1279	*	ILLEGAL INSTRUCTION INTERRUPT TRAP			MST12790
		1280	*				MST12800
15D4	C820 4632	1281	II	LHI	R2,C'F2'		MST12810
15D8	4020 16AC	1282		STH	R2,ERRNO	SET ERROR # F2	MST12820
15DC		1283		IFZ	ADC-2		MST12830
15DC	4820 1636	1284		LH	R2,MOD32		MST12840
15E0	2135	1285		BNZS	II32		MST12850
15E2	48E0 0030	1286		LH	R14,X'30'	OLD PSW	MST12860
15E6	48F0 0032	1287		LH	R15,X'32'	CLD LOC	MST12870
		1288		ENDC			MST12880
15EA	4300 1586	1289	II32	B	COMM		MST12890

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		1290	*						MST12900
		1291	*	MACHINE MALFUNCTION INTERRUPT TRAP					MST12910
		1292	*						MST12920
15EE	95AA	1293	MM	EPSR R10,R10		CAPTURE MMINT PSW			MST12930
15F0	C820 4633	1294		LHI R2,C*F3*					MST12940
15F4	4020 16AC	1295		STH R2,ERRNO		SET ERROR # F3			MST12950
15F8	48E0 0022	1296		LH R14,X*22*		CLD PSW ( 32-EIT PROCESSOR)			MST12960
15FC	48F0 0026	1297		LH R15,X*26*		CLD LOC			MST12970
1600		1298		IFZ ADC-2					MST12980
1600	4820 1636	1299		LH R2,MOD32					MST12990
1604	2135	1300		BNZS MM32					MST13000
1606	48E0 0038	1301		LH R14,X*38*		CLD PSW (16 BIT PROCESSOR)			MST13010
160A	48F0 003A	1302		LH R15,X*3A*		CLD LOC			MST13020
		1303		ENDC					MST13030
160E	C4E0 FFF0	1304	MM32	NHI R14,X*FFF0*					MST13040
1612	C4A0 000F	1305		NHI R10,X*000F*					MST13050
1616	06EA	1306		CAR R14,R10					MST13060
1618	40E0 1642	1307		STH R14,OPSW					MST13070
161C	40F0 1646	1308		STH R15,OLOC					MST13080
1620		1309		IFZ ADC-2					MST13090
1620	C810 7FFF	1310		LHI R1,X*7FFF*					MST13100
1624	2711	1311	MM16	SIS R1,1					MST13110
1626	2021	1312		BPS MM16					MST13120
		1313		ENDC					MST13130
1628	C800 080F	1314		LHI R0,X*080F*					MST13140
162C	9104	1315		SLHLS R0,4		RO = X*80F0*			MST13150
162E	9520	1316		EPSR R2,R0		HALT PROCESSOR			MST13160
		1317	*						MST13170
		1318	*	WHEN EXE/RUN IS DEPRESSED, ERROR MSG IS PRINTED.					MST13180
		1319	*						MST13190
1630	4300 15BE	1320		B COMM1					MST13200
		1321	*	*****					MST13210
		1322	*	ETPE CONSTANTS & TABLES					MST13220
		1323	*						MST13230
1634	0000	1324	FIRST	DCX 0					MST13240
1636	0000	1325	MCD32	DCX 0		FLAG FOR 32-BIT M/C(NON-ZERO)			MST13250
1638	0000	1326	INTPSW	DCX 0		(FCR 32-BIT M/C ONLY)			MST13260
1640		1327		ALIGN 8					MST13270
		1328		-----					MST13280
1640	0000	1329	OPSW32	DCX 0		CLD PSW STORAGE AREA			MST13290
1642	0000	1330	OPSW	DCX 0					MST13300
1644	0000	1331		DCX 0					MST13310
1646	0000	1332	OLOC	DCX 0					MST13320
		1333		-----					MST13330
1648	0000	1334	INTDEV	DCX 0		INTERRUPTING DEV ADR			MST13340
	0000 1648	1335	ERRDEV	EQU INTDEV		ERROR DEVICE #			MST13350
164A	00	1336	INTSTA	DB 0		INTERRUPTING DEV STATUS			MST13360
	0000 164A	1337	ERRSTA	EQU INTSTA		ERRNECUS STATUS			MST13370
164B	00	1338	SINK	DB 0		EIT BUCKET			MST13380
164C	80	1339	NORM	DB X*80*					MST13390
164D	40	1340	INCR	DB X*40*					MST13400
164E	0000	1341	PASFLG	DCX 0		SET WHEN CONSOLE ON PASLA/PALM			MST13410
1650	0000	1342	CONADR	DCX 0		CONSOLE/KEYBOARD DEVICE ADDRESS			MST13420

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1652	0000		1343	CONRD	DCX	0		MST13430
	0000	1653	1344	CONWRT	EQU	CONRD+1		MST13440
1654	C000		1345	CON2ND	DCX	0	2ND CMD, ENABLE RD CMD	MST13450
	0000	1655	1346	CONENRD	EQU	CON2ND+1		MST13460
1656	B9AB		1347	CRTRD	DCX	B9AB	CRT READ/WRITE COMMANDS	MST13470
	0000	1657	1348	CRTWRT	EQU	CRTRD+1		MST13480
1658	A9AB		1349	CARRD	DCX	A9AB	CARCUSEL 300 READ/WRITE COMMANDS	MST13490
	0000	1659	1350	CARWRT	EQU	CARRD+1		MST13500
165A	3B		1351	CRTRQ2S	DB	X*3B*		MST13510
165B	23		1352	CARRQ2S	DB	X*23*		MST13520
165C	00		1353	CONRQ2S	DB	0		MST13530
165E	F879		1354	CRT2ND	DCX	F879	CRT FORMAT COMMAND	MST13540
	0000	165F	1355	CRTENRD	EQU	CRT2ND+1	ENABLE RD CMD	MST13550
1660	F069		1356	CAR2ND	DCX	F069	CARCUSEL FORMAT COMMAND	MST13560
	0000	1661	1357	CARENRD	EQU	CAR2ND+1	ENABLE RD CMD	MST13570
1662	80		1358	LPWRT	DB	X*80*		MST13580
1664	A4D8		1359	CLIFRD	DCX	A4D8		MST13590
	0000	1665	1360	CLIFWRT	EQU	CLIFRD+1		MST13600
1666	0064		1361	CLIF2ND	DCX	0064	CURRENT LOOP INTERFACE	MST13610
	0000	1667	1362	CLIFNRD	EQU	CLIF2ND+1	ENABLE RD CMD	MST13620
			1363	*				MST13630
1668	14AE		1364	KBINT	DC	Z(RETOPSW)	KEYBOARD INT RETURN ADR	MST13640
166A	0000		1365	BRKVECT	DC	Z(0)	BREAK KEY VECTOR	MST13650
166C	0000		1366	ISITERR	DCX	0		MST13660
166E	0000		1367	NOERR	DCX	0		MST13670
1670	0000		1368	SELTST	DCX	0	HIGHEST SELECTED TEST #	MST13680
1672	0000		1369	WASCU	DCX	0	1 IF KEYBOARD DEVICE WAS OFF	MST13690
1674	0000		1370	WASDU1	DCX	0	NON-ZERO IF TOTAL, TOTERR TO PRINT	MST13700
1676	0000		1371	TOTAL	DCX	0	# OF TIMES THE SELECTED TESTS RUN	MST13710
1678	0000		1372	TOTERR	DCX	0	TOTAL ERRORS DETECTED WHILE DU	MST13720
167A	0000		1373	BTESTNO	DCX	0	CURRENT TEST # IN BINARY	MST13730
167C	0000		1374	COUNT	DCX	0		MST13740
167E	0000		1375	NEXTST	DCX	0	NEXT TEST #	MST13750
			1376	*				MST13760
1680	0001		1377	DECTAB	DC	1,10,100,1000,10000		MST13770
1682	000A							
1684	0064							
1686	03E8							
1688	2710							
168A	3031	3233 3435 3637	1378	HEXTAB	DB	C*0123456789ABCDEF*		MST13780
1692	3839	4142 4344 4546						
			1379	*-----*				MST13790
			1380	* ETPE MESSAGES				MST13800
			1381	*				MST13810
169A	5445	5354 2020 2A2A	1382	TSTMSE	DC	C*TEST ***,X*0D00*		MST13820
16A2	0D00							
	0000	16A0	1383	MTESTNO	EQU	--4		MST13830
16A4	4552	524F 5220 2A2A	1384	ERRMSE	DC	C*ERROR *****,X*0D00*		MST13840
16AC	2A2A							
16AE	0D00							
	0000	16AA	1385	ETESTNO	EQU	--6	STORED BY ETPE	MST13850
	0000	16AC	1386	ERRNO	EQU	--4	STCR ERRNO AS CHAR CONSTANT	MST13860
16B0	544F	5441 4C20 2020	1387	TCTMSE	DC	C*TOTAL TCTERR*,X*0C00*		MST13870



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16B8	544F 5445 5252									
16BE	0D00									
16C0	4E4F 2045 5252 4F52	1388	NOERMSG	DC	C'NO ERROR',X'0D00'				MST13880	
16C2	0D00									
16CA	4445 5620 2A2A 2A20	1389	DEVMSG	DC	C'DEV *** STA **',X'0C00' **				MST13890	
16D2	5354 4120 2A2A									
16D8	0D00									
	0000 16CE	1390	ASCIDEV	EQU	*-12				MST13900	
	0000 16D2	1391	STAMSG	EQU	*-8				MST13910	
	0000 16D6	1392	ASCISTA	EQU	*-4				MST13920	
16DA	4445 5620 2A2A 2A20	1393	DEVMSG2	DC	C'DEV ****',X'0D00'				MST13930	
16E2	0D00									
	0000 16DE	1394	ASCIDEV2	EQU	*-6				MST13940	
16E4	5053 5720 2A2A 2A2A	1395	PSWMSG	DC	C'PSW **** LCC ****',X'0D00'				MST13950	
16EC	2020 4C4F 4320 2A2A									
16F4	2A2A									
16F6	0D00									
	0000 16E8	1396	ASCIPSW	EQU	*-16				MST13960	
	0000 16EE	1397	LOCMSG	EQU	*-10				MST13970	
	0000 16F2	1398	ASCILOC	EQU	*-6				MST13980	
16F8	494E 5445 5252 5550	1399	INTLVLM	DC	C'INTERRUPTED IN LEVEL **',X'0D00'				MST13990	
1700	5445 4420 494E 204C									
1702	4556 454C 2020 2A20									
1710	0D00									
	0000 170E	1400	ERRLVL	EQU	*-4				MST14000	
1712	4445 5620 2A2A 2A20	1401	OUSYS	DC	C'DEV *** FALSE SYNC',X'0D00' **				MST14010	
171A	4641 4C53 4520 5359									
1722	4E43									
1724	0D00									
1726	2A20 4142 4F52 5445	1402	ABTMSG	DC	C'* ABCRTEC **',X'0D00' **				MST14020	
172E	4420 2A20									
1732	0D00									
1734	454E 4420 4F46 2C54	1403	ECTMSG	DC	C'END OF TEST',X'0D00'				MST14030	
173C	4553 5420									
1740	0D00									
1742	3F0D	1404	QMSG	DC	X'3F0D'				MST14040	
1744	2A0D	1405	AMSG	DC	X'2A0D'				MST14050	

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

			1407	*-----*				MST14070
			1408	* OPTION/COMMAND TABLE				MST14080
			1409	*				MST14090
	0000	1746	1410	OPT	EQU	*		MST14100
1746	5445	5354 2020	1411	TEST	DC	C*TEST ',X'FFEO',X'04CO',X'0000'		MST14110
174C	FFEO							
174E	04CO							
1750	0000							
1752	4C4F	4359 4C20	1412	LOCYL	DC	C*LOCYL ',X'FFFF',Z(RFNTCK),X'0000'		MST14120
1758	FFFF							
175A	1026							
175C	0000							
175E	4849	4359 4C20	1413	HICYL	DC	C'HICYL ',X'FFFF',X'0000',X'0000'		MST14130
1764	FFFF							
1766	0000							
1768	0000							
176A	5345	4354 4F52	1414	SECTOR	DC	C*SECTOR',X'0000',Z(RFNTCK),X'0000'		MST14140
1770	0000							
1772	1026							
1774	0000							
1776	5041	4354 5950	1415	PACTYP	DC	C*PACTYP',X'CE00',X'0000',X'0000' DEFAULT 67 MB CE PACK		MST14150
177C	CE00							
177E	0000							
1780	0000							
1782	4259	434B 4144	1416	BYCKAD	DC	C*BYCKAD',X'0000',Z(ZERCNE),X'0000'		MST14160
1788	0000							
178A	0CAE							
178C	0000							
178E	5345	4C43 4820	1417	SELCH	DC	C*SELCH ',X'00F0',Z(ADR),X'0000'		MST14170
1794	00F0							
1796	0CB6							
1798	0000							
179A	4449	5343 4F4E	1418	DISCON	DC	C*DISCON',X'00FB',Z(ACR),X'0000'		MST14180
17A0	00FB							
17A2	0CB6							
17A4	0000							
17A6	4452	4956 4520	1419	DRIVE	DC	C*DRIVE ',X'FFFF',X'0000',X'0000' DRIVES 0-3		MST14190
17AC	FFFF							
17AE	0000							
17B0	0000							
17B2	5846	494C 4520	1420	XFILE	DC	C*XFILE ',X'FFFF',X'0000',X'0000'		MST14200
17B8	FFFF							
17BA	0000							
17BC	0000							
17BE	5245	5452 5520	1421	RETRY	DC	C*RETRY ',X'0001',X'0000',X'0000' ALLOWED RETRIES		MST14210
17C4	0001							
17C6	0000							
17C8	0000							
17CA	5449	4D56 414C	1422	TIMVAL	DC	C*TIMVAL',X'0000',X'0000',X'0000'		MST14220
17D0	0000							
17D2	0000							
17D4	0000							
17DE	4441	5441 2020	1423	DATA	DC	C*DATA ',X'B8B8',X'0000',X'0000' DATA BYTES WRITTEN		MST14230

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

17DC	8888							
17DE	0000							
17EG	0000							
17E2	5343 4F50 4520	1424	SCOPE	DC	C*SCOPE ',X*0000',X*0000',X*0000'		MST14240	
17E8	0000							
17EA	0000							
17EC	0000							
17EE	4F46 4653 4554	1425	OFFSET	DC	C*OFFSET',X*0034',X*0000',X*0000'		MST14250	
17F4	0034							
17F6	0000							
17FE	0000							
17FA	4255 4653 495A	1426	BUFSIZ	DC	C*BUFSIZ',X*0000',Z(ZERONE),X*0000'		MST14260	
1800	0000							
1802	0CAE							
1804	0000							
1806	5345 434E 554D	1427	SECNUM	DC	C*SECNUM',X*0003',X*0000',X*0000'		MST14270	
180C	0003							
180E	0000							
1810	0000							
1812	5345 454B 2020	1428	SEEK	DC	C*SEEK ',X*0000',Z(ZERONE),X*0000'		MST14280	
1818	0000							
181A	0CAE							
181C	0000							
181E	4C4F 4F50 2020	1429	LCOP	DC	C*LOOP ',X*0000',X*0000',X*0000'		MST14290	
1824	0000							
182E	0000							
1828	0000							
182A	434F 4E54 494E	1430	CONTIN	DC	C*CONTIN',X*0000',Z(ZERONE),X*0000'		MST14300	
1830	0000							
1832	0CAE							
1834	0000							
183E	4E4F 4D53 4720	1431	NOMSG	DC	C*NOMSG ',X*0000',Z(LEVEL),X*0000' VARIABLE SUPPRESSI**		MST14310	
183C	0000							
183E	0CBE							
1840	0000							
1842	494E 544C 4556	1432	INTLEV	DC	C*INTLEV',X*0000',Z(LEVEL),X*0000'		MST14320	
1848	0000							
184A	0CBE							
184C	0000							
184E	4E4F 4155 544F	1433	NOAUTO	DC	C*NOAUTO',X*0000',Z(NCAUTX),X*0000'		MST14330	
1854	0000							
185E	1D4E							
1858	0000							
	0000 185A	1434	OPTEND2	EQU	*	END OF PRINTING OPTIONS	MST14340	
185A	4845 4144 5320	1435	HEADS	DC	C*HEADS ',X*0000',Z(NCHEADR),X*0000'		MST14350	
186C	0000							
1862	1C72							
1864	0000							
186E	494E 425E 4620	1436	INBUF	DC	C*INBUF ',X*0000',Z(RBUFIN),X*0000'		MST14360	
186C	0000							
186E	1C56							
1870	0000							
1872	4F55 5442 5546	1437	OUTBUF	DC	C*OUTBUF',X*0000',Z(WBUFIN),X*0000'		MST14370	



## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

18E4	2BC6						
18E6	2C0A						
18E8	2CA0						
18EA	2D48						
18EC	2DF0	1464	DC	TEST18,TEST19,TEST1A,TEST1E,TEST1C			MST14640
18EE	2E44						
18F0	2F42						
18F2	3002						
18F4	308E						
18FE	C01C	1465	MAXTST	DCX	001C		MST14650
		1466	*				MST14660
	0000 0002	1467	TABSIZ	EQU	2	TABLE SIZES:	MST14670
18F8	0005	1468	HEADTAB	DCX	5,13		MST14680
18FA	0013						
18FC	0337	1469	CYLTAB	DCX	337,337		MST14690
18FE	0337						
		1470	* COMMAND BYTES				MST14700
		1471	*				MST14710
1900		1472		ALIGN	2		MST14720
1900	00	1473	WCMD	DB	X'00'	CURRENT WRITE COMMAND	MST14730
1901	00	1474	RCMD	DB	X'00'	CURRENT READ COMMAND	MST14740
1902	10	1475	CYLCMD	DB	X'10'	SET CYLINDER	MST14750
1903	20	1476	HEDCMD	DB	X'20'	SET HEAD	MST14760
1904	00	1477	CFFCMD	DB	X'00'	OFFSET COMMAND USED, SCOPE LOOPS	MST14770
1905	03	1478	RCHECK	DB	X'03'	READ CJECK	MST14780
1906	80	1479	RELEASE	DB	X'80'	DRIVE RELEASE COMMAND	MST14790
1907	70	1480	CLEAR	DB	X'70'	DRIVE CLEAR FAULT	MST14800
1908	C8	1481	RESET	DB	X'C8'	CONTROLLER RESET	MST14810
1909	C2	1482	SEEK	DB	X'C2'	SEEK	MST14820
190A	C1	1483	RESTCC	DB	X'C1'	RESTORE	MST14830
190B	42	1484	ISKCMD	DB	X'42'	INTERRUPT SEEK COMMAND	MST14840
190C	41	1485	IRESTCC	DB	X'41'	INTERRLPT RESTORE COMMAND	MST14850
190D	08	1486	STOP	DB	X'08'	SELCH STGP	MST14860
190E	48	1487	ESTOP	DB	X'48'	SELCH STGP, EXTENDED MODE	MST14870
190F	00	1488	GAP1	DB	X'00'		MST14880
1910	0F	1489	SYNC	DB	X'0F'	SYNC BYTE	MST14890
1911	00	1490	SLCHCMD	DB	X'00'	SELCH COMMAND USED	MST14900
		1491	*				MST14910
1912	30	1492	CMD.30	DB	X'30'	CFFSETS NOMINAL	MST14920
1913	31	1493	CMD.31	DB	X'31'	STROBE LATE	MST14930
1914	32	1494	CMD.32	DB	X'32'	STROBE EARLY	MST14940
1915	34	1495	CMD.34	DB	X'34'	SERVO MINUS	MST14950
1916	35	1496	CMD.35	DB	X'35'	SERVO MINUS, STROBE LATE	MST14960
1917	36	1497	CMD.36	DB	X'36'	SERVO MINUS, STROBE EARLY	MST14970
1918	38	1498	CMD.38	DB	X'38'	SERVO PLUS	MST14980
1919	39	1499	CMD.39	DB	X'39'	SERVO PLUS, STROBE LATE	MST14990
191A	3A	1500	CMD.3A	DB	X'3A'	SERVO PLUS, STROBE EARLY	MST15000
191E	00	1501		DB	*	END OF COMMAND BYTES	MST15010
191C	4130	1502	IDDC	DC	X'4130'	USED IN TEST 7	MST15020
		1503	*				MST15030
		1504	* STATUS BYTE EQUATES				MST15040
		1505	*				MST15050
		1506	* CONTROLLER				MST15060

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

		1507 *							MST15070
	0000	0080	1508	WRTprt	EQU	X*80*		SECTOR WRITE-PROTECTED	MST15080
	0000	0040	1509	FDFAIL	EQU	X*40*		SECTOR HEADER MATCH FAILURE	MST15090
	0000	0020	1510	DEFSEC	EQU	X*20*		SECTOR WAS MARKED DEFECTIVE	MST15100
	0000	0010	1511	CYLOW	EQU	X*10*		CYLINDER OVERFLOW OCCURRED	MST15110
	0000	0008	1512	BSY	EQU	X*08*		BUSY	MST15120
	0000	0004	1513	EX	EQU	X*04*		EXAMINE	MST15130
	0000	0002	1514	IDLE	EQU	X*02*		CONTROLLER IDLE	MST15140
	0000	0001	1515	DATERR	EQU	X*01*		DATA TRANSFER ERROR	MST15150
			1516 *						MST15160
			1517 *	DRIVE	ADDITIONAL				MST15170
			1518 *						MST15180
	0000	0020	1519	ALTCHAN	EQU	X*20*		RESERVED TO ALTERNATE CHANNEL	MST15190
	0000	0010	1520	UNSAFE	EQU	X*10*		DRIVE UNSAFE	MST15200
	0000	0008	1521	NOTRDY	EQU	X*08*		DRIVE NOT READY	MST15210
	0000	0002	1522	SEEKINC	EQU	X*02*		SEEK INCOMPLETE	MST15220
	0000	0001	1523	OFFLINE	EQU	X*01*		DRIVE OFF-LINE	MST15230
			1524 *						MST15240
	0000	0040	1525	MAXSEC	EQU	64		(NORMAL) MAX SECTS + 1	MST15250
	0000	0100	1526	LRECL	EQU	256		NORMAL MODE RECORD LENGTH	MST15260
	0000	0114	1527	PRECL	EQU	276		FORMAT MODE REC LENGTH/SECTOR	MST15270
	0000	000E	1528	GAPSIZE	EQU	14		ALL-ZERO GAP SIZE	MST15280
			1529 *						MST15290
191E	0000		1530	MAXCYL	DCX	0		MAX CYL ADRS + 1	MST15300
1920	0000		1531	MAXHEAD	DCX	0		MAX HEAD ADRS + 1	MST15310
1922	0000		1532	RDER	DCX	0		READ ERROR FLAG	MST15320
1924	0000		1533	FLAGS	DCX	0		TEST MODULE INTERNAL FLAGS	MST15330
1926	0000		1534	RFMTFLG	DCX	0		SET IF LOCYL FORMAT PGT. DESTROYED	MST15340
1928	0000		1535	ERRFLG1	DCX	0		SET WHEN ERROR DETECTED BY SVC	MST15350
192A	0000		1536	LRCC	DCX	0		CKSUM USED IN SCOPE LOOPS	MST15360
192C	0000		1537	RND1	DCX	0		RANDOM NUMBER	MST15370
192E	0000		1538	RND2	DCX	0		RANDOM NUMBER	MST15380
1930	0000		1539	STATE	DCX	0		CURRENT DRIVE ADDRESS	MST15390
1932	0000		1540	RRCTR	DCX	0		ERROR COUNTER (DECREMENTS)	MST15400
1934	0000		1541	RWOCMD	DCX	0		USED BY 'READ', 'WRITE'	MST15410
1936	0000		1542	OPCODE	DCX	0		CURRENT OPERATION'S 'CODE' (CC)	MST15420
1938	0000		1543	ERPSCNT	DCX	0		EXPECTED ROT POS SENSE VALUE	MST15430
193A	0000		1544	EDATA	DCX	0		EXPECTED DATA ON READ	MST15440
193C	0000		1545	RDATA	DCX	0		ACTUAL DATA READ	MST15450
193E	0000		1546	HEADSA	DCX	0,0		HEADS DELETED, TESTS 8,9,A	MST15460
1940	0000								
1942	0000		1547	SVCNUM	DCX	0		SVC NUMBER FROM CALLER	MST15470
1944	0000		1548	SEQPTR	DCX	0		ERROR PRINT CONTROL (INTERNAL)	MST15480
1946	0000		1549	CURSECT	DCX	0		CURRENT SECTOR (LOGICAL)	MST15490
1948	0000		1550	CURSECT2	DCX	0		CURRENT SECTOR (PHYSICAL)	MST15500
194A	0000		1551	HEAD	DCX	0		CURRENT HEAD NUMBER	MST15510
194C	0000		1552	CURCYL	DCX	0		CURRENT CYLINDER NUMBER	MST15520
194E	0000		1553	RPSCNT	DCX	0		RPS COUNT READ FROM DRIVE	MST15530
1950	0000		1554	COUNTER	DCX	0		INTERNAL LOOPS COUNTER	MST15540
1952	0000		1555	FUTADRS	DCX	0		ADRS OF PRIMARY DRIVE	MST15550
1954	0000		1556	SECFILAD	DCX	0		ADRS OF SECONDARY DRIVE	MST15560
1958			1557	ALIGN	8				MST15570
1958	0000	0000	1558	SVCPSW	DCY	0,0		RETURN PSW FOR SVC.DRV (32-BIT)	MST15580

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195C	0000	0000							
196C	0000		1559	BLKADRS	DAC	0	SVC PARAM BLK ADRS		MST15590
1962	0000		1560	MEMTOP	DAC	0	DETECTED TOP-OF-MEMORY		MST15600
1964	0000		1561	SIZE	DAC	0	XFER SIZE		MST15610
1966	00FF		1562	IDSIZE	DAC	LRECL-1	USED IN TEST 7		MST15620
1968	0000		1563	EXSELAD	DAC	0	SELCH END ADRS READ		MST15630
	0000	1968	1564	BCOUNT	EQU	EXSELAD	BYTE COUNT AT ERROR.		MST15640
196A	4350		1565	RDFADR	DAC	RDF	READ BUFFER ADDRESS		MST15650
196C	3F00		1566	WTFADR	DAC	WTF	WRITE BUFFER ADDRESS		MST15660
196E	0000		1567	SA	DAC	0	TRANSFER START		MST15670
197C	0000		1568	FA	DAC	0	TRANSFER END		MST15680
1972	0000		1569	SW1SAV	DAC	0	USED IN TESTS 8,9,A		MST15690
1974	0000		1570	RSRET	DAC	0	SAVE		MST15700
1976	0000		1571	RMSAVE	DAC	0	SAVE		MST15710
1978	0000		1572	FLGRTN	DAC	0	SAVE		MST15720
197A	0000		1573	SKRTN	DAC	0	SAVE		MST15730
197C	0000		1574	INTSKR	DAC	0	SAVE		MST15740
197E	0000		1575	RERN	DAC	0	RERUN ADDRESS		MST15750
1980	0000		1576	RXRFL	DAC	0	ADDRESS OF TEST SVC IN LOOP TESTS		MST15760
1982	0000		1577	ERRFLG	DAC	0	ADDRESS OF TEST SVC USED		MST15770
1984	0000		1578	TEMPA	DAC	0	SAVE		MST15780
1986	0000		1579	TEMPB	DAC	0	SAVE		MST15790
1988	0000		1580	TEMPC	DAC	0	SAVE		MST15800
			1581	*					MST15810
	0000	198A	1582	STATTAB	EQU	*	DEVICE STATUSES CN GIVEN ERROR		MST15820
198A	00		1583		DB	0	SELECTOR CHANNEL		MST15830
198B	00		1584		DB	0	DISC SYSTEM CONTROLLER		MST15840
198C	00		1585		DB	0	DRIVE 0		MST15850
198D	00		1586		DB	0	DRIVE 1		MST15860
198E	00		1587		DB	0	DRIVE 2		MST15870
198F	00		1588		DB	0	DRIVE 3		MST15880
			1589	*					MST15890
	0000	1990	1590	SVCVECTS	EQU	*	SVC NEW PSW LOCATIONS		MST15900
1990	38D8		1591		DC	Z(SVC0.OP)			MST15910
1992	38E6		1592		DC	Z(SVC1.OP)			MST15920
1994	38F2		1593		DC	Z(SVC2.OP)			MST15930
1996	38FE		1594		DC	Z(SVC3.OP)			MST15940
1998	390A		1595		DC	Z(SVC4.OP)			MST15950
199A	3916		1596		DC	Z(SVC5.OP)			MST15960
199C	391C		1597		CC	Z(SVC6.OP)			MST15970
199E	3926		1598		CC	Z(SVC7.OP)			MST15980
19A0	3930		1599		DC	Z(SVC8.OP)			MST15990
19A2	393A		1600		DC	Z(SVC9.OP)			MST16000
	0000	0003	1602	DCAD	EQU	3			MST16020
	0000	0004	1603	SLAD	EQU	4			MST16030
	0000	0005	1604	FUT	EQU	5			MST16040
	0000	0006	1605	WK0	EQU	6			MST16050
	0000	0007	1606	WK1	EQU	7			MST16060
	0000	0008	1607	WK2	EQU	8			MST16070
	0000	0009	1608	WK3	EQU	9			MST16080

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0000	000A	1609	STAT	EQU	10		MST16090
0000	000B	1610	TRACK	EQU	11		MST16100
0000	000C	1611	OPKEY	EQU	12		MST16110
0000	000D	1612	SECT	EQU	13		MST16120
0000	000E	1613	RETN2	EQU	14		MST16130
0000	000F	1614	RETN	EQU	15		MST16140
		1616	*	MESSAGES			MST16160
		1617	*				MST16170
19A4		1618	IFNZ	ADC-2			MST16180
		1620	ELSE				
19A4	4D53 4D20 4449 5343	1621	TITLE	DB	C'MSM DISC TEST 06-200F01R01 (16 BIT)'		MST16210
19AC	2054 4553 5420 3036						
19B4	2D32 3030 4630 3152						
19BC	3031 2028 3136 2042						
19C4	4954 29						
		1622	ENDC				MST16220
19C7	0D	1623	DB	X'0D'			MST16240
19C8	454E 5445 5220 4445	1624	MSG01	DB	C'ENTER DELETED HEACS',X'0D'		MST16250
19D0	4C45 5445 4420 4845						
19D8	4144 530D						
19DC	494E 5641 4C49 4420	1625	MSG02	DB	C'INVALID OPTION',X'0D'		MST16260
19E4	2020 2020 2020 2020						
19EC	204F 5054 494F 4E0D						
19F4	494C 4C45 4741 4C20	1626	MSG03	DB	C'ILLEGAL CYLADRS - CE PACK',X'0D'		MST16270
19FC	4359 4C41 4452 5320						
1A04	2D2D 4345 2050 4143						
1A0C	4B0D						
1A0E	5245 2D46 4F52 4D41	1627	MSG04	DB	C'RE-FORMAT LOCYL',X'0D'		MST16280
1A1E	5420 4C4F 4359 4C0D						
1A1E	4445 4620 5345 4320	1628	MSG05	DB	C'DEF SEC FLAGGED *** ** **',X'0D'		MST16290
1A2E	464C 4147 4745 4420						
1A2E	2A2A 2A20 2A2A 202A						
1A36	2A0D						
1A38	464C 4147 2052 454A	1629	MSG06	DB	C'FLAG REJECTED <---X',X'0D'		MST16300
1A40	4543 5445 4420 3C2D						
1A48	2D2D 580D						
1A4C	5441 4B45 2044 5249	1630	MSG07	DB	C'TAKE DRIVE OFF-LINE',X'0D'		MST16310
1A54	5645 2D4F 4646 2D4C						
1A5C	494E 450D						
	0000 1A50	1631	MSG08	EQU	MSG07+4		MST16320
1A60	5055 5420 4452 4956	1632	MSG09	DB	C'PUT DRIVE ON-LINE',X'0D'		MST16330
1A68	4520 4F4E 2D4C 494E						
1A70	450D						
1A72	5345 5420 5752 4954	1633	MSG10	DB	C'SET WRITE-PROTECT OFF',X'0D'		MST16340
1A7A	452D 5052 4F54 4543						
1A82	5420 4F46 460D						
	0000 1A75	1634	MSG11	EQU	MSG10+3		MST16350
1A88	5345 5420 5752 4954	1635	MSG12	DB	C'SET WRITE-PROTECT ON',X'0D'		MST16360
1A90	452D 5052 4F54 4543						
1A98	5420 4F4E 0D						



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	0000 1A8B		1636	MSG13	EQU	MSG12+3		MST16370
1A9C	534F 4C49 4420 4552		1637	MSG14	DB	C'SOLID ERROR: ',X'0D'		MST16380
1AAE	524F 523A 0D							
1AAA	4259 5445 5320 2020	1638	MSG15	DB	C'BYTES	READ **** ',X'0D'		MST16390
1AB2	2020 2020 2052 4541							
1ABA	4420 2A2A 2A2A 0D							
1AC1	5345 4C43 4820 4641	1639	MSG16	DB	C'SELCH FA	' ',X'0D'		MST16400
1AC9	2020 2020 2020 200D							
1AD2			1640			ALIGN 2		MST16405
1AD2	5348 4F55 4C44 2042	1641	MSG17	DB	C'SHOULD BE	' ',X'0D'		MST16410
1ADA	4520 2020 2020 2020							
1AE2	200D							
1AE4	4359 4C20 2A2A 2A20	1642	MSG18	DB	C'CYL *** HEAD ** SECT *** ',X'0D'			MST16420
1AEC	4845 4144 202A 2A20							
1AF4	5345 4354 202A 2A0D							
1AFC	414C 5445 524E 4154	1643	MSG19	DB	C'ALTERNATE CHANNEL BUSY ',X'0D'			MST16430
1B04	4520 4348 414E 4E45							
1B0C	4C20 4255 5359 0D							
1B13	2046 4F52 4D41 5420	1644	MSG20	DB	C' FORMAT SWITCH OFF ',X'0D'			MST16440
1B1E	5357 4954 4348 204F							
1B23	4646 0D							
1B26	5052 4F54 4543 5445	1645	MSG21	DB	C'PROTECTED WRITE VIOLATION ',X'0D'			MST16450
1B2E	4420 5752 4954 4520							
1B36	5649 4F4C 4154 494F							
1B3E	4E0D							
1B40	4841 5244 2052 4541	1646	MSG22	DB	C'HARD READ ERROR ',X'0D'			MST16460
1B4E	4420 4552 524F 520D							
1B5C	534F 4654 2052 4541	1647	MSG23	DB	C'SOFT READ ERROR ',X'0D'			MST16470
1B5E	4420 4552 524F 520D							
1B6C			1648			ALIGN 2		MST16480
1B6C	5445 5354 2020 5858	1649	MSG24	DB	C'TEST XX ABCRTEC ',X'0D'			MST16490
1B6E	2020 4142 4F52 5445							
1B7C	440D							
1B72	4D45 4D4F 5259 204C	1650	MSG25	DB	C'MEMORY LIMIT EXCEEDED ',X'0D'			MST16500
1B7A	494D 4954 2045 5843							
1B82	4545 4445 440D							
1B8E	5345 4C45 4354 204E	1651	MSG26	DB	C'SELECT NEW SECTOR OPTION ',X'0D'			MST16510
1B90	4557 2053 4543 544F							
1B9E	5220 4F50 5449 4F4E							
1BA0	0D							
1BA1	5354 4154 5553 2020	1652	MSG27	DB	C'STATUS	(6 DEVICES)		MST16520
1BA9	2020 2020 2020 2020							
1BB1	2020 2020 2020 2020							
1BB9	2020 0D							
1BBC	494E 4255 4620 2020	1653	MSG28	DB	C'INBUF	' ',X'0D'		MST16530
1BC4	2020 2020 200D							
1BCA	4F55 5442 5546 2020	1654	MSG29	DB	C'OUTBUF	' ',X'0D'		MST16540
1BD2	2020 2020 200D							
1BD8	5250 5320 202A 2A0C	1655	MSG30	DB	C'RPS *** ',X'0D'			MST16550
1BE0			1656			ALIGN 2		MST16560
1BE0	4552 524F 5220 5454	1657	MSG31	DB	C'ERROR TTCNN ',X'0D'			MST16570
1BE8	4343 4E4E 0D							
1BED	4154 5445 4C50 5449	1658	MSG32	DB	C'ATTEMPTING RE-FCRMT ',X'0D'			MST16580

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

1BF5	4E47	2052	452D	464F						
1BFD	524D	4154	0D							
1C02	4241	434B	4752	4F55	1655	MSG33	DB	C'BACKGROUND FAILURE',X'0D'		MST16550
1C0A	4E44	2046	4149	4C55						
1C12	5245	0D								
1C15	5245	464F	524D	4154	1660	MSG34	DB	C'REFORMAT ABORTED',X'0D'		MST16600
1C1D	2041	424F	5254	4544						
1C25	0D									
1C2E	414C	5445	524E	4154	1661	MSG35	DB	C'ALTERNATE SECTOR ASSIGNED',X'0D'		MST16610
1C2E	4520	5345	4354	4F52						
1C3E	2041	5353	4947	4E45						
1C3E	440D									
1C40	5052	4F43	4545	4420	1662	MSG36	DB	C'PROCEED WITH CAUTION',X'0D'		MST16620
1C48	5749	5448	2043	4155						
1C50	5449	4F4E	0D							
1C55	00				1663		DB	*		MST16630

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

		1666	*OPTION ENTRY HANDLERS			MST16660
		1667	*			MST16670
1C56	C810 196A	1668	RBUFIN LDAI R1,RDFADR	READ BUFFER POINTER		MST16680
1C5A	2303	1669	BS BUFIN.1			MST16690
1C5C	C810 196C	1670	WBUFIN LDAI R1,WTFADR	WRITE BUFFER POINTER		MST16700
1C60	C460 FFFE	1671	BUFIN.1 NHI R6,X'FFFE'	FORCE ALIGN 2		MST16710
1C64	C560 3F00	1672	CLAI R6,WTF	ABOVE PROGRAM ?		MST16720
1C68	028C	1673	BLR R12	INPUT ERROR		MST16730
1C6A	4061 0000	1674	STA R6,0(R1)	SAVE OPTION VALUE		MST16740
1C6E	4300 0AEC	1675	B OPTIN			MST16750
		1676	*			MST16760
1C72	2470	1677	NOHEADR LIS R7,0			MST16770
1C74	2480	1678	LIS R8,0			MST16780
1C76	0866	1679	LDAR R6,R6	HEADS 0 ?		MST16790
1C78	4330 1CCC	1680	BZ NOHEAD1	BRANCH: DELETE NONE.		MST16800
1C7C	41F0 1D26	1681	BAL R15,RFMTCK	CHECK IF RE-FCRMT REQ'D.		MST16810
1C80	41F0 0CAE	1682	BAL R15,ZERONE	MUST BE 0 OR 1		MST16820
1C84	C850 19C8	1683	LDAI R5,MSG01			MST16830
1C88	4050 166C	1684	STH R5,ISITERR			MST16840
1C8C	41F0 11C6	1685	BAL LINK,CRLF			MST16850
1C90	41F0 1126	1686	BAL R15,PRINT	'ENTER DELETED HEADS'		MST16860
1C94	C840 003E	1687	LHI R4,C'>'			MST16870
1C98	41F0 11D4	1688	BAL R15,CUTCHR	'>' FOR PROMPT		MST16880
1C9C	2541	1689	LCS R4,1			MST16890
1C9E	41F0 11D4	1690	BAL R15,OUTCHR	FOLLOWED BY 'DELETE' FOR PASLA		MST16900
		1691	*			MST16910
1CA2	4850 1920	1692	LH R5,MAXHEAD			MST16920
1CA6	41E0 1076	1693	NOH.1 BAL R14,OPTVAL			MST16930
1CAA	0565	1694	CLAR R6,R5			MST16940
1CAC	038C	1695	BNLR R12	INVALID HEAD #		MST16950
1CAE	C560 0010	1696	CLHI R6,16			MST16960
1CB2	2385	1697	BNLS NOH.2			MST16970
1CB4	41E0 10AC	1698	BAL R14,UNARY			MST16980
1CB8	0673	1699	CAR R7,R3	SET CURRENT BIT		MST16990
1CBA	2306	1700	BS NOH.3			MST17000
1CBC	C860 0010	1701	NOH.2 SHI R6,16			MST17010
1CC0	41E0 10AC	1702	BAL R14,UNARY			MST17020
1CC4	0683	1703	CAR R8,R3	SET CURRENT BIT		MST17030
1CC6	274D	1704	NOH.3 SIS R4,13			MST17040
1CC8	4230 1CA6	1705	BNZ NOH.1			MST17050
1CCC	4070 193E	1706	NOHEAD1 STH R7,HEADSA			MST17060
1CD0	4080 1940	1707	STH R8,HEADSA+2			MST17070
1CD4	4300 0AEC	1708	B OPTIN	TC COMMAND MODE		MST17080
		1709	*			MST17090
1CD8	41F0 11C6	1710	OPTIONAD BAL R15,CRLF			MST17100
1CDC	2404	1711	LIS R0,ADC+2	DIGIT COUNT		MST17110
1CDE	4810 196A	1712	LDA R1,RDFADR			MST17120
1CE2	C820 1BC3	1713	LDAI R2,MSG28+7			MST17130
1CE6	41F0 10FE	1714	BAL R15,HEXASC			MST17140
1CEA	40F0 166C	1715	STH R15,ISITERR	FORCE PRINT		MST17150



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1D90	41F0	1DD0	1767	ERROR6	BAL	R15,SETMSG	INVALID OFFSET OPTION	MST17670
1D94	17EE		1768		DC	Z(OFFSET)		MST17680
1D96	41F0	1DD0	1769	ERROR7	BAL	R15,SETMSG	INVALID PACTYP OPTION	MST17690
1D9A	1776		1770		DC	Z(PACTYP)		MST17700
1D9C	41F0	1DD0	1771	ERROR9	BAL	R15,SETMSG	INVALID SCOPE OPTION	MST17710
1DA0	17E2		1772		DC	Z(SCOPE)		MST17720
1DA2	41F0	1DD0	1773	ERROR10	BAL	R15,SETMSG	INVALID TIMVAL OPTION	MST17730
1DA6	17CA		1774		DC	Z(TIMVAL)		MST17740
1DA8	C850	19F4	1775	ERROR11	LDAI	R5,MSG03	INVALID CYLADRS - CE PACK	MST17750
1DAC	4300	1DE8	1776		B	PRINTIT		MST17760
1DB0	C850	1B72	1777	ERROR12	LDAI	R5,MSG25	AVAILABLE MEMORY EXCEEDED	MST17770
1DB4	4300	1DE8	1778		B	PRINTIT		MST17780
1DBE	41F0	1DD0	1779	ERROR13	BAL	R15,SETMSG	INVALID XFILE OPTION	MST17790
1DBC	1782		1780		DC	Z(XFILE)		MST17800
1DBE	41F0	1DD0	1781	ERROR14	BAL	R15,SETMSG	INVALID INBUF OPTION	MST17810
1DC2	1866		1782		DC	Z(INBUF)		MST17820
1DC4	41F0	1DD0	1783	ERROR15	BAL	R15,SETMSG	INVALID OUTBUF OPTION	MST17830
1DC8	1872		1784		DC	Z(OUTBUF)		MST17840
1DCA	41F0	1DD0	1785	ERROR16	BAL	R15,SETMSG	INVALID HEADS OPTION	MST17850
1DCE	185A		1786		DC	Z(HEADS)		MST17860
			1787	*				MST17870
1DD0	485F	0000	1788	SETMSG	LH	R5,0(R15)	GET ARGUMENT POINTER	MST17880
1DD4	2486		1789		LIS	WK2,6		MST17890
1DD6	D375	0005	1790	SETMSG1	LB	WK1,5(R5)		MST17900
1DDA	D278	19E5	1791		STB	WK1,MSG02+9(WK2)		MST17910
1DDE	2751		1792		SIS	R5,1		MST17920
1DEC	2781		1793		SIS	WK2,1		MST17930
1DE2	2026		1794		BPS	SETMSG1		MST17940
1DE4	C850	19DC	1795		LDAI	R5,MSG02		MST17950
1DE8	41F0	1334	1796	PRINTIT	BAL	LINK,SETKB		MST17960
1DEC	40F0	166C	1797		STH	LINK,ISITERR	FORCE PRINT	MST17970
1DF0	41F0	1126	1798		BAL	R15,PRINT		MST17980
1DF4	4300	0AF0	1799		B	OPTIN1	TO EXEC	MST17990
			1801	*INITIALIZATION				MST18010
1DF8	C860	8000	1802	INIT	LHI	R6,X*8000*		MST18020
1DFC	4660	174C	1803		CH	R6,TEST+6		MST18030
1E00	4060	174C	1804		STH	R6,TEST+6	SET TEST0 BIT	MST18040
			1805	*				MST18050
1E04	C800	1D72	1806		LDAI	R0,ERROR1		MST18060
1E08	4870	180C	1807		LH	WK1,SECNUM+6		MST18070
1E0C	2671		1808		AIS	WK1,1		MST18080
1E0E	0330		1809		BZR	R0	INVALID SECNUM OPTION	MST18090
1E10	9071		1810		SRLS	WK1,1	INPUT EVEN-PCWER-OF-2 (LESS 1)	MST18100
1E12	2281		1811		BFBS	8,1	WAIT FOR CARRY	MST18110
1E14	C230		1812		BNZR	R0		MST18120
			1813	*				MST18130
1E16	41F0	356E	1814		BAL	R15,XFERSIZP	GET LARGEST TRANSFER SIZE	MST18140
1E1A	4810	196C	1815		LDA	R1,WTFADR	WRITE BUFFER ADDRESS	MST18150
1E1E	4820	196A	1816		LDA	R2,RDFADR		MST18160
1E22	0512		1817		CLAR	R1,R2	IS WTF BELCW RDF ?	MST18170



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1EC6	9074	1871	SRLS	R7,4	PRECISION WHICH WILL BE USED:	MST18710
1EC8	4330 1DA2	1872	BZ	ERROR10	UNDERFLOW.	MST18720
		1873	*			MST18730
1ECC	C360 17F5	1874	LB	R6,OFFSET+7	LOAD OFFSET COMMAND	MST18740
1ED0	0876	1875	LDAR	R7,R6		MST18750
1ED2	2339	1876	BZS	INI.0		MST18760
1ED4	2418	1877	LIS	R1,8		MST18770
1ED6	D471 1912	1878	INI.X	CLB	R7,CHD.30(R1)	MST18780
1EDA	2335	1879	BES	INI.0	BRANCH: VALID OFFSET COMMAND.	MST18790
1EDC	2711	1880	SIS	R1,1		MST18800
1EDE	2214	1881	BNMS	INI.X		MST18810
1EE0	4300 1D90	1882	B	ERROR6	INVALID OFFSET OPTION.	MST18820
		1883	*			MST18830
1EE4	C360 1770	1884	INI.0	LB	R6,SECTOR+6	MST18840
1EE8	4560 1920	1885	CLH	R6,MAXHEAD	HEAD PORTION	MST18850
1EEC	4380 1D8A	1886	BNL	ERROR5		MST18860
1EF0	C810 193E	1887	LDAI	R1,HEADSA	DELETED HEAD BITS -	MST18870
1EF4	C560 0010	1888	CLHI	R6,16		MST18880
1EF8	2184	1889	BLS	INI.A		MST18890
1EFA	C860 0010	1890	SHI	R6,16		MST18900
1EFE	2612	1891	AIS	R1,2		MST18910
1F00	41E0 10AC	1892	INI.A	BAL	R14,UNARY	MST18920
1F04	4431 0000	1893	NH	R3,0(R1)	SET MASK POSITION	MST18930
1F08	4230 1DCA	1894	BNZ	ERROR16	SECTOR, HEADS OPTION MUST AGREE:	MST18940
1F0C	D360 1771	1895	LB	R6,SECTOR+7	INVALID HEADS OPTION	MST18950
1F10	C560 0041	1896	CLHI	R6,MAXSEC+1	SECTOR PORTION	MST18960
1F14	4380 1D8A	1897	BNL	ERROR5	0-X*40° VALID IN SOME CASES	MST18970
		1898	*			MST18980
1F18	4860 17E8	1899	LH	R6,SCOPE+6		MST18990
1F1C	9062	1900	SRLS	R6,2	0-3 VALID IN SOME CASES	MST19000
1F1E	4230 1D9C	1901	BNZ	ERROR9		MST19010
		1902	*			MST19020
1F22	4860 1794	1903	LH	R6,SELCH+6	SET UP SYSTEM DEVICES TABLE	MST19030
1F26	4060 1898	1904	STH	R6,DEVSADR		MST19040
1F2A	4860 17A0	1905	LH	R6,DISCON+6		MST19050
1F2E	4060 189A	1906	STH	R6,DEVSADR+2		MST19060
1F32	2470	1907	LIS	R7,0		MST19070
1F34	2661	1908	INI.1	AIS	R6,1	MST19080
1F36	4067 189C	1909	STH	R6,DEVSADR+4(R7)	DRIVES 0-3	MST19090
1F3A	2672	1910	AIS	R7,2		MST19100
1F3C	C570 0008	1911	CLHI	R7,8		MST19110
1F40	2086	1912	BLS	INI.1		MST19120
		1913	*			MST19130
1F42	2415	1914	LIS	R1,5		MST19140
1F44	D360 1849	1915	LB	R6,INTLEV+7		MST19150
1F48	D261 1882	1916	INI.2	STB	R6,INTLVL(R1)	MST19160
1F4C	2711	1917	SIS	R1,1		MST19170
1F4E	2213	1918	BNMS	INI.2		MST19180
		1919	*			MST19190
1F50	2400	1920	LIS	R0,0		MST19200
1F52	4000 0098	1921	STH	R0,X*98°	SET UP SVC NEW PSM, VECTORS.	MST19210
1F56	C800 3000	1922	LHI	R0,X*3000°		MST19220
1F5A	4000 009A	1923	STH	R0,X*9A°		MST19230

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1F5E	C810 0012	1924		LHI	R1,18		MST19240
1F62	4801 1990	1925	INI.3	LH	R0,SVCVECTS(R1)		MST19250
1F66	4001 009C	1926		STH	R0,X*9C*(R1)		MST19260
1F6A	2712	1927		SIS	R1,2		MST19270
1F6C	2215	1928		BNMS	INI.3		MST19280
		1929	*				MST19290
1F6E	2411	1930		LIS	R1,1	INIT RANDCM NUMBER GENERATOR	MST19300
1F70	4010 192C	1931		STH	R1,RND1		MST19310
1F74	0A11	1932		AAR	R1,R1		MST19320
1F76	4010 192E	1933		STH	R1,RND2		MST19330
		1934	*				MST19340
1F7A	C810 1FA6	1935	GETMTC	LHI	R1,FOUNDTOP	SET MM INT VECTOR	MST19350
1F7E	4010 003E	1936		STH	R1,X*3E*	FOR USE IN SEARCH.	MST19360
1F82	C810 3FFE	1937		LHI	R1,X*4000*-ADC	MINIMUM REQ'D MEMORY	MST19370
1F86	25F5	1938		LCS	R15,5	TEST PATTERN = F---FFFB	MST19380
1F88	48B1 0000	1939	TOP2	LDA	R11,0(R1)	SAVE CURRENT CONTENTS	MST19390
1F8C	40F1 0000	1940		STA	R15,0(R1)	INSERT TEST PATTERN	MST19400
1F90	4080 0000	1941		STA	R11,0	TO CLEAR MDR	MST19410
1F94	48E1 0000	1942		LDA	R14,0(R1)	RELOAD TEST PATTERN (?)	MST19420
1F98	05EF	1943		CLAR	R14,R15	MEMORY THERE ?	MST19430
1F9A	2136	1944		BNES	FOUNDTOP	BRANCH: NO.	MST19440
1F9C	4081 0000	1945		STA	R11,0(R1)	RESTORE ORIG. DATA	MST19450
1FA0	CA10 0400	1946		AHI	R1,X*400*	ADVANCE 1KB	MST19460
1FA4	228E	1947		BNCS	TOP2	CONTINUE	MST19470
		1948	* NOTE- ASSUMES MAX MEMORY ON 16-BIT MACHINE = 64KB.				MST19480
1FAE	C800 15EE	1949	FOUNDTOP	LHI	R0,MM		MST19490
1FAA	4000 003E	1950		STH	R0,X*3E*	RESTORE MMINT VECTOR	MST19500
1FAE	4830 0A22	1951		LH	R3,PSW2	RE-ENABLE PMINT	MST19510
1FB2	9523	1952		EPSR	R2,R3		MST19520
1FB4		1953		IFZ	ADC-2		MST19530
1FB4	CB10 0400	1954		SHI	R1,X*400*	CORRECT EXCESS ADDITION	MST19540
		1955		ELSE			MST19550
		1957		ENDC			MST19570
1FB8	4010 1962	1958		STA	R1,MENTOP	EFFECTIVE TOP-OF-MEMCRY	MST19580
1FBC	C810 15EE	1959		LHI	R1,MM		MST19590
1FC0	4010 003E	1960		STH	R1,X*3E*	RESTORE MM INT VECTOR.	MST19600
1FC4	4300 0D2C	1961		B	INITRET	RETURN	MST19610



## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

		1963	*	*****		MST19630
		1964	*			MST19640
		1965	*	TO INITIALIZE DEDICATED DEVICE ADDRESS REGISTERS.		MST19650
		1966	*	TO PUT DEVICES IN INITIAL STATES, TEST MODULE OPTIONS.		MST19660
		1967	*	CALLING SEQUENCE BAL RETN,MODINIT		MST19670
		1968	*	DCX MODULEFLAGS		MST19680
		1969	*			MST19690
		1970	*	MODULE FLAGS HAVE THE FOLLOWING MEANINGS:		MST19700
		1971	*	BIT 15 - REQUIRES TRACK EVALUATION		MST19710
		1972	*	BIT 14 - NO ABORT (SCOPE LOOPS)		MST19720
		1973	*	BIT 13 - 65 SECTORS/TRACK ALLOWED		MST19730
		1974	*	BIT 12 - SECONDARY DRIVE TO BE USED		MST19740
		1975	*	BIT 11 - READ-ONLY/TEST DATA SCOPE OPTIONS DISALLOWED		MST19750
		1976	*	BIT 10 - NO HEADS MAY BE DELETED		MST19760
		1977	*	BIT 09 - SECNUM > X'3F' ALLOWED.		MST19770
		1978	*	BIT 08 - REQUIRES 'TSECT' INITIALIZATION		MST19780
		1979	*	BIT 00 - REFORMAT IN PROGRESS		MST19790
		1980	*			MST19800
		1981	*	MODINIT LH R0,0(RETN) LOAD MODULE FLAGS		MST19810
		1982	*	LH R1,BTESTNO		MST19820
		1983	*	BZ MOD.3 BRANCH: TEST 0 NEED NOT CHECK FLAGS		MST19830
		1984	*	THI R0,X'0010'	SCOPE 1 & 3 ILLEGAL ?	MST19840
		1985	*	BZS MOD.1 BRANCH: ACCEPTABLE.		MST19850
		1986	*	LIS R1,1		MST19860
		1987	*	NH R1,SCOPE+6		MST19870
		1988	*	BNZ ERROR9 INVALID SCOPE OPTION		MST19880
		1989	*	MOD.1 THI R0,X'0020'	ARE HEADS ALLOWED TO BE DELETED ?	MST19890
		1990	*	BNZ MOD.2 BRANCH: NO.		MST19900
		1991	*	LH R1,SECNUM+6		MST19910
		1992	*	AIS R1,1 SET TO EVEN-POWER-CF-2		MST19920
		1993	*	LHI R2,X'FF80'	CORRESPONDING MASK -	MST19930
		1994	*	THI R0,X'40'	GREATER THAN 1 TRACK XFER ALLOWED ?	MST19940
		1995	*	BZS MOD.1A BRANCH: NO.		MST19950
		1996	*	LHI R2,0 MAX LIMIT MASK -		MST19960
		1997	*	MOD.1A THI R1,0(R2)		MST19970
		1998	*	BNZ ERROR1 INVALID SECNUM OPTION		MST19980
		1999	*	CLHI R1,MAXSEC+1 MORE THAN 1 TRACK ?		MST19990
		2000	*	BLS MOD.3 BRANCH: NO.		MST20000
		2001	*	MOD.2 LH R1,HEADSA		MST20010
		2002	*	OH R1,HEADSA+2 ANY HEADS DELETED ?		MST20020
		2003	*	BNZ ERROR16 INVALID 'HEADS' OPTION		MST20030
		2004	*	MOD.3 STH R0,FLAGS		MST20040
		2005	*	AIS RETN,2 ADVANCE PAST MODULE FLAGS		MST20050
		2006	*	STA RETN,TEMPB WILL GO TO 'RERN'		MST20060
		2007	*	LH R0,RETRY+6		MST20070
		2008	*	STH R0,RRCTR INITIALIZE TO MAX RETRIES		MST20080
		2009	*			MST20090
		2010	*	LIS R0,0		MST20100
		2011	*	LIS R1,10		MST20110
		2012	*	MOD.4 STH R0,DEVINT(R1) REMOVE INTPT VECTORS		MST20120
		2013	*	SIS R1,2		MST20130
		2014	*	BNMS MOD.4		MST20140
		2015	*			MST20150
1FC8	480F 0000					
1FCC	4810 167A					
1FD0	4330 201A					
1FD4	C300 0010					
1FD8	2336					
1FDA	2411					
1FDC	4410 17E8					
1FE0	4230 1D9C					
1FE4	C300 0020					
1FE8	4230 200E					
1FEC	4810 180C					
1FF0	2611					
1FF2	C820 FF80					
1FF6	C300 0040					
1FFA	2333					
1FFC	C820 0000					
2000	C312 0000					
2004	4230 1D72					
2008	C510 0041					
200C	2187					
200E	4810 193E					
2012	4610 1940					
2016	4230 1DCA					
201A	4000 1924					
201E	26F2					
2020	40F0 1986					
2024	4800 17C4					
2028	4000 1932					
202C	2400					
202E	241A					
2030	4001 18A6					
2034	2712					
203E	2213					

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

2038	D200 1904	2016	STB	RO,OFFCMD	NO OFFSETS	MST20160
203C	4000 1936	2017	STH	RO,OPCODE	=TESTING INITIAL STATUS	MST20170
2040	4000 166C	2018	STH	RO,ISITERR		MST20180
2044	4000 1982	2019	STA	RO,ERRFLG		MST20190
2048	4000 1980	2020	STA	RO,RXRFL		MST20200
		2021	*			MST20210
204C	4840 1794	2022	LH	SLAD,SELCH+6		MST20220
2050	4830 17A0	2023	LH	DCAD,DISCON+6		MST20230
2054	4850 1952	2024	LH	FUT,FUTADRS		MST20240
2058	4050 1930	2025	STH	FUT,STATE	SET 'STATE' = MAIN DRIVE	MST20250
205C	DE40 1900	2026	OC	SLAD,STOP		MST20260
2060	DE30 1908	2027	OC	DCAD,RESET		MST20270
		2028	*			MST20280
2064	41F0 2068	2029	BAL	R15,MOD.4A		MST20290
2068	40F0 197E	2030	MOD.4A	STA R15,RERN	FCR MCDINIT ERRORS -	MST20300
206C	24D0	2031	LIS	SECT,0		MST20310
206E	4000 1946	2032	STH	SECT,CURSECT		MST20320
2072	2480	2033	LIS	TRACK,0		MST20330
2074	4080 194C	2034	STH	TRACK,CURCYL		MST20340
2078	4080 194A	2035	STH	TRACK,HEAD	HEAD 0	MST20350
207C	41F0 3412	2036	BAL	R15,SETHEAD	SET HEAD	MST20360
2080	DE50 1907	2037	OC	FUT,CLEAR	CLEAR FAULT	MST20370
2084	41E0 3456	2038	BAL	R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST20380
2088	000F	2039	CCX	000F		MST20390
208A	5D5A	2040	SSR	FUT,STAT		MST20400
208C	2323	2041	BFFS	SEEKINC,MOD.5		MST20410
208E	41F0 3662	2042	BAL	R15,RESTORE		MST20420
2092	4880 1758	2043	MOD.5	LH TRACK,LOCYL+6		MST20430
2096	4800 1924	2044	LH	RO,FLAGS	RELOAD MODULE FLAGS:	MST20440
209A	C300 0081	2045	THI	RO,X'0081'	TEST TSECT, EVALUATE BITS	MST20450
209E	2333	2046	EZS	MOD.6	BRANCH: NO SEEK REQUIRED.	MST20460
20A0	4190 3612	2047	BAL	WK3,TSECT	GET CYLINDER, HEAD, SECTOR	MST20470
20A4	4800 1924	2048	MOD.6	LH RO,FLAGS		MST20480
20A8	910F	2049	SLHLS	RO,15	EXTRACT EVALUATION BIT	MST20490
20AA	2338	2050	BZS	MOD.7		MST20500
20AC	4800 1854	2051	TESTAUTO	LH RO,NOAUTO+6	ARE PRE-EVAL & POST-FMT INHIBITED ?	MST20510
20B0	2135	2052	BNZS	MCD.7	BRANCH: YES.	MST20520
20B2	41F0 3794	2053	BAL	R15,TENSECT	EVALUATE TRACK	MST20530
20B6	D3D0 1771	2054	LB	SECT,SECTOR+7		MST20540
20BA	48F0 1986	2055	MOD.7	LDA R15,TEMPB		MST20550
20BE	40F0 197E	2056	STA	R15,RERN	RERUN ADDRESS	MST20560
20C2	030F	2057	BR	R15	RETURN TO CALLER.	MST20570

## SYSTEM TEST SEQUENCES - TEST 00

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2059 * *****
2060 *
2061 *           T E S T   0
2062 *
2063 * PURPOSE OF TEST:
2064 * TEST 0 CHECKS THE STATUS OF THE SELECTOR CHANNEL, CONTROLLER, AND
2065 * DISC DRIVE(S) TO BE USED. TEST 0 IS RUN BEFORE ALL OTHER
2066 * SELECTED TESTS, AND CANNOT BE BYPASSED.
2067 *
2068 * ASSUMPTIONS:
2069 * THE DISC DRIVE MUST BE ON-LINE AND NOT WRITE-PROTECTED; THE DRIVE
2070 * MUST NOT BE RESERVED TO THE ALTERNATE CHANNEL.
2071 * IT IS ASSUMED THAT THE PROCESSOR, SELCH, MEMORY, AND CONSOLE I/O
2072 * TESTS HAVE BEEN RUN SUCCESSFULLY, PRIOR TO SELECTING THIS TEST.
2073 *
2074 * DESIGN SPECIFICATIONS:
2075 * TO RUN TEST 0 WITH NO ERRORS,
2076 *       1) THE SELCH MUST NOT BE BUSY FOLLOWING A 'STOP' COMMAND.
2077 *       2) CONTROLLER 'BUSY' AND 'IDLE' STATUS BITS, ONLY, MUST BE SET.
2078 *       3) ALL DISC DRIVE STATUS BITS MUST BE RESET.
2079 *
2080 * HOW TO RUN THE TEST:
2081 * ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE OPTIONS.
2082 * SELECT THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.
2083 *
2084 * OPTIONS:
2085 * LOOP, CONTIN, SELCH, DISCON, DRIVE
2086 *
2087 * ERRORS:
2088 * 000000 - 00FFFF

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MST20590
MST20600
MST20610
MST20620
MST20630
MST20640
MST20650
MST20660
MST20670
MST20680
MST20690
MST20700
MST20710
MST20720
MST20730
MST20740
MST20750
MST20760
MST20770
MST20780
MST20790
MST20800
MST20810
MST20820
MST20830
MST20840
MST20850
MST20860
MST20870
MST20880

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20C4 41F0 1FC8      2090 TEST0  BAL  RETN,MODINIT      MST20900
20C8 0000          2091          DCX  0                NO SPECIAL FLAGS  MST20910
20CA 4850 1952      2092          LH   FUT,FUTACRS      MST20920
20CE 4050 1930      2093          STH  FUT,STATE        MST20930
20D2 E110 3D72      2094          SVC  1,PBLK01        TEST SELCH NOT BUSY  MST20940
20D6 E120 3D76      2095          SVC  2,PBLK02        TEST CTRLR STATUS = X'0A' OR X'0B'  MST20950
20DA E130 3D7A      2096          SVC  3,PBLK03        TEST DRIVE STATUS NOT = X'20'  MST20960
20DE E130 3D7E      2097          SVC  3,PBLK04        TEST DRIVE STATUS = X'00'  MST20970
20E2 2408          2098          LIS  R0,X'0008'     BIT FOR TESTOC      MST20980
20E4 4400 174C      2099          NH   R0,TEST+6     WILL TEST 0C BE RUN ?  MST20990
20E8 233B          2100          EZS  TST0.1        BRANCH: NO.         MST21000
20EA 4850 1954      2101          LH   FUT,SECFILAD  MST21010
20EE 4050 1930      2102          STH  FUT,STATE        MST21020
20F2 E120 3D76      2103          SVC  2,PBLK02        TEST CTRLR STATUS = X'0A' OR X'0B'  MST21030
20F6 E130 3D7A      2104          SVC  3,PBLK03        TEST XFILE STATUS NOT X'20'  MST21040
20FA E130 3D7E      2105          SVC  3,PBLK04        TEST XFILE STATUS X'00'  MST21050
20FE 4300 0E50      2106          TST0.1 B  KEEP7     RUN ONCE ONLY.     MST21060

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## SYSTEM TEST SEQUENCES - TEST 01

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2108 * *****
2109 *
2110 *           T E S T   1
2111 *
2112 * PURPOSE OF TEST:
2113 * TEST 1 PERFORMS A SIMPLE CHECK OF THE SEEK AND RESTORE FUNCTIONS.
2114 * ALSO CHECKS SERVO OFFSET PLUS/MINUS.
2115 *
2116 * ASSUMPTIONS:
2117 * THE DISC DRIVE MUST BE ON-LINE, AND NOT RESERVED TO THE ALTERNATE
2118 * CHANNEL. THE DISC PACK MUST BE FORMATTED IF BYCKAD = 0.
2119 *
2120 * DESIGN SPECIFICATIONS:
2121 * THE TEST SEQUENCE FOLLOWS:
2122 *     1) THE HEADS ARE RESTORED TO CYLINDER 0.
2123 *     2) THE MOST SIGNIFICANT VALID CYLINDER ADDRESS BIT
2124 *        IS SET, AND A SEEK IS MADE TO THAT CYLINDER.
2125 *        THE CYLINDER ADDRESS IS THEN DIVIDED BY 2 (SETTING
2126 *        THE NEXT LEAST-SIGNIFICANT BIT), AND THE PROCESS IS
2127 *        REPEATED, UNTIL CYLINDER 1 IS REACHED.
2128 *        (A RESTORE IS PERFORMED BEFORE EACH SEEK.)
2129 *     3) THE HEADS ARE THEN RESTORED TO CYLINDER 0, AND
2130 *        A SEEK IS MADE TO THE MAXIMUM CYLINDER ADDRESS.
2131 *     4) THE HEADS ARE RESTORED TO CYLINDER 0, AND A SEEK
2132 *        IS MADE TO THAT CYLINDER.
2133 *     5) A SEEK IS MADE TO AN INVALID CYLINDER ADDRESS,
2134 *        EXPECTING SEEK-INCOMPLETE STATUS.
2135 *     6) SERVO OFFSET PLUS/MINUS ARE COMMENCED.
2136 *
2137 *     A READ-CHECK IS PERFORMED FOLLOWING EACH SEEK OR
2138 *     RESTORE, IN STEPS 1 THROUGH 4, UNLESS 'BYCKAD' = 1.
2139 *     THE SECTOR SPECIFIED BY THE 'SECTOR' OPTION IS USED.
2140 *
2141 * HOW TO RUN THE TEST:
2142 * ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE OPTIONS,
2143 * SELECT THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.
2144 *
2145 * OPTIONS:
2146 * LOOP, CONTIN, DISCON, DRIVE, BYCKAD, PACTYP, SECTOR, OFFSET
2147 *
2148 * ERRORS:
2149 * 010000 - 01FFFF
2150 *
2102 41F0 1FC8 2151 TEST1  BAL  RETN,MODINIT
2106 0080      2152      DCX  0080          TSECT
2108 C8B0 0200 2153      LHI  TRACK,X'200'    MOST SIGNIF. BIT OF CYL ADRS
210C 40B0 1984 2154 TST1.1  STH  TRACK,TEMPA
2110 41F0 3662 2155      BAL  R15,RESTORE      RESTORE TO CYLINDER 0
2114 41F0 3698 2156      BAL  RETN,CKADSR     READ CHECK
2118 48B0 1984 2157      LH   TRACK,TEMPA
211C 41F0 3384 2158      BAL  RETN,ILLADD     CHECK FOR INVALID CYLINDERS
2120 212A      2159      DAC  TST1.2          BYPASS DESTINATION
2122 41F0 35F0 2160      BAL  RETN,SKSR       SEEK SELECTED CYLINDER
MST21080
MST21090
MST21100
MST21110
MST21120
MST21130
MST21140
MST21150
MST21160
MST21170
MST21180
MST21190
MST21200
MST21210
MST21220
MST21230
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MST21470
MST21480
MST21490
MST21500
MST21510
MST21520
MST21530
MST21540
MST21550
MST21560
MST21570
MST21580
MST21590
MST21600

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## SYSTEM TEST SEQUENCES - TEST 01

2126	41F0 3698	2161	BAL	RETN,CKADSR	CHECK ADDRESS	MST21610	
212A	90B1	2162	TST1.2	SRLS TRACK,1	NEXT BINARY SUBMULTIPLE	MST21620	
212C	4230 210C	2163	BNZ	TST1.1	CONTINUE	MST21630	
		2164	*			MST21640	
2130	41F0 3662	2165	BAL	R15,RESTORE	RESTORE	MST21650	
2134	41F0 3698	2166	BAL	RETN,CKADSR		MST21660	
2138	4880 191E	2167	LH	TRACK,MAXCYL	TO SEEK HIGHEST CYLINDER	MST21670	
213C	27B1	2168	SIS	TRACK,1		MST21680	
213E	41F0 35F0	2169	BAL	RETN,SKSR		MST21690	
2142	41F0 3698	2170	BAL	RETN,CKADSR		MST21700	
2146	41F0 3662	2171	BAL	R15,RESTORE		MST21710	
214A	41F0 35F0	2172	BAL	RETN,SKSR	SEEK CYLINDER 0	MST21720	
214E	41F0 3698	2173	BAL	RETN,CKADSR	CHECK ADDRESS	MST21730	
		2174	*			MST21740	
2152	4880 191E	2175	LH	TRACK,MAXCYL		MST21750	
2156	41F0 33FC	2176	BAL	R15,SETCYL		MST21760	
215A	DE50 1909	2177	OC	FUT,SEEKC		MST21770	
215E	C8C0 0021	2178	LHI	OPKEY,X'21'		MST21780	
2162	40C0 1936	2179	STH	OPKEY,OPCODE	=SEEKING ILLEGAL CYLADRS	MST21790	
2166	E130 3D82	2180	SVC	3,PBLK05	TEST SEEKING SET BY INVALID CYLADRS	MST21800	
216A	41F0 3662	2181	BAL	R15,RESTORE		MST21810	
216E	E130 3D86	2182	TST1.4	SVC	3,PBLK06	MST21820	
		2183	*			MST21830	
2172	D300 1918	2184	LB	RO,CMD.38	SERVO OFFSET PLUS	MST21840	
2176	41F0 2198	2185	BAL	R15,OFSS		MST21850	
217A	DE50 1912	2186	OC	FUT,CMD.30	REQUIRED BY CRIVE INTERNALS	MST21860	
217E	C300 1915	2187	LB	RO,CMD.34	SERVO OFFSET MINUS	MST21870	
2182	41F0 2198	2188	BAL	R15,OFSS		MST21880	
2186	C300 1912	2189	LB	RO,CMD.30		MST21890	
218A	D200 1904	2190	STB	RO,OFFCMD		MST21900	
218E	9E50	2191	OCR	FUT,RO	OFFSETS NOMINAL.	MST21910	
2190	41F0 35F0	2192	BAL	RETN,SKSR	RE-SEEK CYLINDER	MST21920	
2194	4300 0E32	2193	B	TSTEND	EXIT	MST21930	
2198	9E50	2195	OFSS	OCR	FUT,RO	SEND OFFSET COMMAND	MST21950
219A	D200 1904	2196	STB	RO,OFFCMD		MST21960	
219E	C8C0 0040	2197	LHI	OPKEY,X'40'		MST21970	
21A2	40C0 1936	2198	STH	OPKEY,OPCODE	=TESTING OFFSETS	MST21980	
21A6	E130 3D8A	2199	SVC	3,PBLK07	EXPECT DRIVE NOT READY	MST21990	
21AA	41E0 3496	2200	BAL	R14,DWAIT	WAIT FOR DRIVE READY	MST22000	
21AE	0014	2201	CCX	0014		MST22010	
21B0	E130 3D7A	2202	SVC	3,PBLK03	TEST DRIVE STATUS = X'00'	MST22020	
21B4	E120 3DC2	2203	SVC	2,PBLK21	TEST CTRLR STATUS = X'0A'	MST22030	
21B8	030F	2204	BR	R15	RETURN	MST22040	

## SYSTEM TEST SEQUENCES - TEST 02

		2206	*	*****				MST22060
		2207	*					MST22070
		2208	*					MST22080
		2209	*					MST22090
		2210	*	PURPOSE OF TEST:				MST22100
		2211	*	TEST 2 PERFORMS AN EXHAUSTIVE CHECK OF THE HEAD-POSITIONING SERVO.				MST22110
		2212	*					MST22120
		2213	*	ASSUMPTIONS:				MST22130
		2214	*	THE DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE				MST22140
		2215	*	CHANNEL. THE DISC PACK MUST BE FORMATTED IF BYCKAD = 0.				MST22150
		2216	*					MST22160
		2217	*	DESIGN SPECIFICATIONS:				MST22170
		2218	*	FOLLOWING A RESTORE TO CYLINDER 0, A SENSE-STATUS SEEK IS MADE				MST22180
		2219	*	TO THE MAXIMUM VALID CYLINDER ADDRESS. SEEKS ARE THEN MADE TO				MST22190
		2220	*	CYLINDERS 1 AND (MAX-1). THE PROCESS REPEATS UNTIL ALL SEEKS ARE				MST22200
		2221	*	NEAR THE CENTER OF THE RANGE, THEN CONTINUES AS THE RANGE EXPANDS.				MST22210
		2222	*	THE TEST TERMINATES WHEN MAXIMUM RANGE HAS BEEN REACHED.				MST22220
		2223	*					MST22230
		2224	*	A READ-CHECK IS PERFORMED ON THE HEAD AND SECTOR SPECIFIED				MST22240
		2225	*	BY THE 'SECTOR' OPTION, FOR ALL CYLINDERS, IF 'BYCKAD' = 0.				MST22250
		2226	*					MST22260
		2227	*	HOW TO RUN THE TEST:				MST22270
		2228	*	ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE OPTIONS,				MST22280
		2229	*	SELECT THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.				MST22290
		2230	*					MST22300
		2231	*	OPTIONS:				MST22310
		2232	*	LOOP, CONTIN, DISCON, DRIVE, BYCKAD, PACTYP, SECTOR				MST22320
		2233	*					MST22330
		2234	*	ERRORS:				MST22340
		2235	*	020000 - 02FFFF				MST22350
		2236	*					MST22360
		2237	TEST2	BAL	RETN,MODINIT			MST22370
21BA	41F0	1FC8		DCX	0080	TSECT		MST22380
21BE	0080			BAL	R15,RESTORE	RESTORE TO CYL 0		MST22390
21C0	41F0	3662		LIS	WK0,0	IF 0: SEEK (WK2); ELSE SEEK (WK1).		MST22400
21C4	2460			LCS	WK1,1	ASCENDING CYLINDERS		MST22410
21C6	2571			LH	WK2,MAXCYL	DESCENDING CYLINDERS		MST22420
21C8	4880	191E		OSCT1	SIS	WK2,1		MST22430
21CC	2781			BM	ISTEND			MST22440
21CE	4210	0E32		LDAR	TRACK,WK2			MST22450
21D2	0888			BAL	RETN,ILLADD	CHECK CE PACK INVALID ADDRESS		MST22460
21D4	41F0	3384		DAC	OSCT3	BYPASS DESTINATION		MST22470
21D8	21E2			BAL	RETN,SKSR	SEEK CYLINDER, IF NOT VOID		MST22480
21DA	41F0	35F0		BAL	RETN,CKDSR	DO READ CHECK		MST22490
21DE	41F0	3698		OSCT3	XHI	WK0,-1		MST22500
21E2	C760	FFFF		BNM	OSCT1	CHANGE SENSE OF SEEK		MST22510
21E6	4310	21CC		AIS	WK1,1	BRANCH: SEEK DESCENDING		MST22520
21EA	2671			LDAR	TRACK,WK1			MST22530
21EC	08B7			BS	OSCT2	SEEK ASCENDING.		MST22540
21EE	220D							

## SYSTEM TEST SEQUENCES - TEST 03

	2256	*	*****			MST22560
	2257	*				MST22570
	2258	*	TEST 3			MST22580
	2259	*				MST22590
	2260	*	PURPOSE OF TEST:			MST22600
	2261	*	TEST 3 PERFORMS SEEKS TO RANDOM CYLINDERS BETWEEN LOCYL AND HICYL.			MST22610
	2262	*	DESIGNED TO DISCOVER ERRORS NOT DETECTED BY TESTS 1 AND 2.			MST22620
	2263	*				MST22630
	2264	*	ASSUMPTIONS:			MST22640
	2265	*	THE DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE			MST22650
	2266	*	CHANNEL. THE DISC PACK MUST BE FORMATTED IF BYCKAD = 0.			MST22660
	2267	*				MST22670
	2268	*	DESIGN SPECIFICATIONS:			MST22680
	2269	*	ONE THOUSAND SEEKS ARE MADE TO RANDOM CYLINDER ADDRESSES			MST22690
	2270	*	SUPPLIED BY A FIBONACCI GENERATOR.			MST22700
	2271	*	SEEK ADDRESSES NOT ALLOWED TO EXCEED THE HICYL OPTION SPECIFIED.			MST22710
	2272	*	NOR TO BE LESS THAN SPECIFIED LOCYL OPTION.			MST22720
	2273	*	A READ-CHECK IS PERFORMED ON THE HEAD AND SECTOR SPECIFIED BY			MST22730
	2274	*	THE 'SECTOR' OPTION AFTER EACH SEEK, UNLESS THE 'BYCKAD'			MST22740
	2275	*	OPTION = 0.			MST22750
	2276	*				MST22760
	2277	*	HOW TO RUN THE TEST:			MST22770
	2278	*	ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE OPTIONS,			MST22780
	2279	*	AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.			MST22790
	2280	*				MST22800
	2281	*	OPTIONS:			MST22810
	2282	*	LOOP, CONTIN, DISCON, DRIVE, BYCKAD, PACTYP, LOCYL, HICYL,			MST22820
	2283	*	SECTOR			MST22830
	2284	*				MST22840
	2285	*	ERRORS:			MST22850
	2286	*	030000 - 03FFFF			MST22860
	2287	*				MST22870
21F0	41F0 1FC8	2288	TEST3 BAL RETN,MODINIT			MST22880
21F4	0080	2289	DCX 0080	TSECT		MST22890
21FE	C800 03E8	2290	LHI R0,1000	SET FOR 1000		MST22900
21FA	4000 1950	2291	STH R0,COUNTER			MST22910
21FE	41F0 36FE	2292	TST3.1 BAL RETN,RAND	RANDOM SEEKS		MST22920
2202	C460 0FFF	2293	NHI WK0,X'OFFF'			MST22930
220E	9062	2294	SRLS WK0,2			MST22940
2208	4960 1764	2295	CH WK0,HICYL+6	NOT TO EXCEED MAX		MST22950
220C	2027	2296	BPS TST3.1			MST22960
220E	4560 1758	2297	CLH WK0,LOCYL+6			MST22970
2212	208A	2298	BLS TST3.1			MST22980
2214	0886	2299	LDAR TRACK,WK0	TO REG TRACK		MST22990
221E	41F0 33B4	2300	BAL RETN,ILLADD	VOID AREAS		MST23000
221A	21FE	2301	CAC TST3.1	EYPASS DESTINATION		MST23010
221C	41F0 35F0	2302	BAL RETN,SKSR	SEEK		MST23020
2220	41F0 3698	2303	BAL RETN,CKADSR	READ CHECK		MST23030
2224	41F0 377E	2304	EAL R15,CNTDOWN	CONTINUE, OR EXIT		MST23040
2228	21FE	2305	DAC TST3.1	CONTINUATION VECTOR		MST23050

## SYSTEM TEST SEQUENCES - TEST 04

		2307	*	*****			MST23070
		2308	*				MST23080
		2309	*	TEST 4			MST23090
		2310	*				MST23100
		2311	*	PURPOSE OF TEST:			MST23110
		2312	*	TEST 4 PERFORMS A SIMPLE CHECK OF THE SEEK COMPLETE INTERRUPT LOGIC.			MST23120
		2313	*				MST23130
		2314	*	ASSUMPTIONS:			MST23140
		2315	*	THE DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE			MST23150
		2316	*	CHANNEL.			MST23160
		2317	*				MST23170
		2318	*	DESIGN SPECIFICATIONS:			MST23180
		2319	*	THE HEADS ARE RESTORED TO CYLINDER 0. AN INTERRUPT VECTOR IS			MST23190
		2320	*	SET UP, AND AN INTERRUPT SEEK IS MADE TO CYLINDER 0. AN INTERRUPT			MST23200
		2321	*	SEEK TO THE MAXIMUM VALID CYLINDER ADDRESS IS THEN PERFORMED.			MST23210
		2322	*	A SEEK IS THEN ATTEMPTED TO AN INVALID CYLINDER ADDRESS, EXPECTING			MST23220
		2323	*	AN INTERRUPT WITH SEEK INCOMPLETE STATUS.			MST23230
		2324	*	THE RESTORE INTERRUPT IS THEN TESTED, FOLLOWED BY SERVO OFFSET			MST23240
		2325	*	INTERRUPT TESTING. THE TEST THEN TERMINATES.			MST23250
		2326	*	NOTE - NO READ CHECKS ARE PERFORMED ON ANY CYLINDER.			MST23260
		2327	*				MST23270
		2328	*	HOW TO RUN THE TEST:			MST23280
		2329	*	ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE OPTICNS,			MST23290
		2330	*	AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.			MST23300
		2331	*				MST23310
		2332	*	OPTIONS:			MST23320
		2333	*	LOOP, CONTIN, DISCON, DRIVE, PACTYP, OFFSET			MST23330
		2334	*				MST23340
		2335	*	ERRORS:			MST23350
		2336	*	040000 - 04FFFF			MST23360
		2337	*				MST23370
222A	41F0 1FC8	2338	TEST4	BAL	RETN,MODINIT		MST23380
222E	0000	2339		DCX	0000	NO SPECIAL FLAGS	MST23390
2230	41F0 3662	2340		BAL	R15,RESTORE		MST23400
2234	41E0 3892	2341		BAL	R14,INSERT	ESTAB. DRIVE INTPT. VECTOR:	MST23410
2238	1952	2342		DC	Z(FUTADRS),Z(SKINTA)		MST23420
223A	31D0						
223C	41E0 31A8	2343		BAL	RETN2,INTSK	SEEK CYLINDER 0	MST23430
2240	48B0 191E	2344		LH	TRACK,MAXCYL	NCW SEEK MAX CYL	MST23440
2244	2781	2345		SIS	TRACK,1		MST23450
2246	41E0 31A8	2346		BAL	RETN2,INTSK		MST23460
224A	41E0 31A8	2347		BAL	RETN2,INTSK	SEEK MAX AGAIN	MST23470
		2348	*				MST23480
224E	48B0 191E	2349		LH	TRACK,MAXCYL		MST23490
2252	41E0 31A8	2350		BAL	RETN2,INTSK		MST23500
2256	C8C0 0021	2351	TST4.1	LHI	OPKEY,X'21'	=SEEKING ILLEGAL CYLADRS	MST23510
225A	40C0 1936	2352		STH	OPKEY,OPCODE		MST23520
225E	E100 3D82	2353		SVC	0,PBLK05	SEEKING SET BY INVALID CYLADRS ?	MST23530
2262	E130 3D82	2354		SVC	3,PBLK05	TEST CURRENT STATUS, ALSO	MST23540
2266	DE50 190C	2355		OC	FUT,IRESTCC	INTERRUPT RESTORE	MST23550
226A	C8C0 0031	2356		LHI	OPKEY,X'31'	=RESTORE FOLLOWING SEEK INCOMPLETE	MST23560
226E	40C0 1936	2357		STH	OPKEY,OPCODE		MST23570
2272	41E0 31C2	2358		BAL	RETN2,INTSK3	WAIT FOR RESTORE INTERRUPT.	MST23580



## SYSTEM TEST SEQUENCES - TEST 04

2276	06D6	2359	DCX	06D6		MST23590
2278	2480	2360	LIS	TRACK,0		MST23600
227A	4080 194C	2361	STH	TRACK,CURCYL		MST23610
227E	E100 3D7E	2362	SVC	0,PBLK04	TEST SEEKING+BSY RESET (IATPT)	MST23620
2282	E130 3D7E	2363	SVC	3,PBLK04	TEST AGAIN (SSR)	MST23630
2286	C800 0100	2365	LHI	R0,256		MST23650
228A	4000 1950	2366	STH	R0,COUNTER		MST23660
		2367	*			MST23670
228E	C8C0 0040	2368	LHI	OPKEY,X*40*	=TESTING SERVO/STROBE OFFSETS	MST23680
2292	40C0 1936	2369	STH	OPKEY,OPCODE		MST23690
2296	D300 1914	2370	LB	R0,CMD.32	STROBE +	MST23700
229A	9E50	2371	OCR	FUT,R0		MST23710
229C	41F0 234E	2372	BAL	R15,TESTAT	TEST RESULTING STATUSES	MST23720
22A0	D300 1913	2373	LB	R0,CMD.31	STROBE -	MST23730
22A4	9E50	2374	OCR	FUT,R0		MST23740
22A6	41F0 234E	2375	BAL	R15,TESTAT		MST23750
22AA	D300 1916	2376	LB	R0,CMD.35	SERVO - STROBE -	MST23760
22AE	D200 1904	2377	STB	R0,OFFCMD		MST23770
22B2	9E50	2378	OCR	FUT,R0		MST23780
22B4	41E0 31C2	2379	BAL	R14,INTSK3	WAIT FOR INTERRUPT, TEST STATUS	MST23790
22B8	00FF	2380	DCX	00FF	TIMEOUT CONSTANT	MST23800
22BA	41F0 2352	2381	BAL	R15,TESTAT1	TEST STATUSES	MST23810
22BE	DE50 1912	2382	OC	FUT,CMD.30	OFFSETS NOMINAL	MST23820
22C2	D300 1919	2383	LB	R0,CMD.35	SERVO + STROBE -	MST23830
22C6	D200 1904	2384	STB	R0,OFFCMD		MST23840
22CA	9E50	2385	OCR	FUT,R0		MST23850
22CC	41E0 31C2	2386	BAL	R14,INTSK3		MST23860
22D0	00FF	2387	DCX	00FF		MST23870
22D2	41F0 2352	2388	BAL	R15,TESTAT1		MST23880
22D6	DE50 1912	2389	OC	FUT,CMD.30	OFFSETS NOMINAL	MST23890
22DA	D300 1915	2390	LB	R0,CMD.34	SERVO -	MST23900
22DE	D200 1904	2391	STB	R0,OFFCMD		MST23910
22E2	9E50	2392	OCR	FUT,R0		MST23920
22E4	41E0 31C2	2393	BAL	R14,INTSK3		MST23930
22E8	00FF	2394	DCX	00FF		MST23940
22EA	41F0 2352	2395	BAL	R15,TESTAT1		MST23950
22EE	DE50 1912	2396	OC	FUT,CMD.30	OFFSETS NOMINAL	MST23960
22F2	D300 1918	2397	LB	R0,CMD.38	SERVO +	MST23970
22F6	D200 1904	2398	STB	R0,OFFCMD		MST23980
22FA	9E50	2399	OCR	FUT,R0		MST23990
22FC	41E0 31C2	2400	BAL	R14,INTSK3		MST24000
2300	00FF	2401	DCX	00FF		MST24010
2302	41F0 2352	2402	BAL	R15,TESTAT1		MST24020
2306	DE50 1912	2403	OC	FUT,CMD.30	OFFSETS NOMINAL	MST24030
230A	D300 1917	2404	LB	R0,CMD.36	SERVO - STROBE +	MST24040
230E	D200 1904	2405	STB	R0,OFFCMD		MST24050
2312	9E50	2406	OCR	FUT,R0		MST24060
2314	41E0 31C2	2407	BAL	R14,INTSK3		MST24070
2318	00FF	2408	DCX	00FF		MST24080
231A	41F0 2352	2409	BAL	R15,TESTAT1		MST24090

## SYSTEM TEST SEQUENCES - TEST 04

231E	DE50	1912	2410	OC	FUT,CMD.30	OFFSETS NOMINAL	MST24100
2322	D300	191A	2411	LB	RO,CMD.3A	SERVO + STROBE +	MST24110
2326	D200	1904	2412	STB	RO,OFFCMD		MST24120
232A	9E50		2413	OCR	FUT,RO		MST24130
232C	41E0	31C2	2414	BAL	R14,INTSK3		MST24140
2330	00FF		2415	DCX	00FF		MST24150
2332	41F0	2352	2416	BAL	R15,TESTAT1		MST24160
2336	D300	1912	2417	LB	RO,CMD.30	OFFSETS NOMINAL	MST24170
233A	D200	1904	2418	STB	RO,OFFCMD		MST24180
233E	9E50		2419	OCR	FUT,RO		MST24190
2340	41E0	31A8	2420	BAL	R14,INTSK	RESEEK NOMINAL	MST24200
2344	41F0	2352	2421	BAL	R15,TESTAT1		MST24210
2348	41F0	377E	2422	BAL	R15,CNTDOWN	LOOP, OR EXIT.	MST24220
234C	228E		2423	DAC	TST4.2	CONTINUATION VECTOR	MST24230
234E	D200	1904	2425	TESTAT	STB	RO,OFFCMD	MST24250
2352	40F0	2364	2426	TESTAT1	STA	R15,SAVE	MST24260
2356	E130	3D7E	2427		SVC	3,PBLK04	MST24270
235A	E120	3DC2	2428		SVC	2,PBLK21	MST24280
235E	48F0	2364	2429		LDA	R15,SAVE	MST24290
2362	030F		2430		BR	R15	MST24300
2364	0000		2432	SAVE	DAC	0	MST24320

TEST DRIVE STATUS = X'00'  
TEST CTRLR STATUS = X'02' OR X'0A'

RETURN

## SYSTEM TEST SEQUENCES - TEST 05

2434	*	*****	MST24340
2435	*		MST24350
2436	*	TEST 5	MST24360
2437	*		MST24370
2438	*	PURPOSE OF TEST:	MST24380
2439	*	TEST 5 PERFORMS A SIMPLE CHECK OF FORMAT-MODE READ/WRITE FUNCTION,	MST24390
2440	*	AND SYNTHESIZES NORMAL-MODE READ/WRITE ERRORS.	MST24400
2441	*		MST24410
2442	*	ASSUMPTIONS:	MST24420
2443	*	THE DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE	MST24430
2444	*	CHANNEL. THE DISC PACK MUST BE PROPERLY FORMATTED ON THE CYLINDER	MST24440
2445	*	SPECIFIED BY THE LOCYL OPTION. THE DISC CONTROLLER MUST BE IN THE	MST24450
2446	*	FORMAT MODE. AN ATTEMPT IS MADE TO RESTORE PROPER FORMAT WHEN	MST24460
2447	*	TEST 5 TERMINATES.	MST24470
2448	*		MST24480
2449	*	DESIGN SPECIFICATIONS:	MST24490
2450	*	A SEEK IS MADE TO 'LOCYL', AND ALL 65 SECTORS OF THE TRACK SPECIFIED	MST24500
2451	*	BY THE HEAD BYTE OF THE 'SECTOR' OPTION ARE EVALUATED FOR DEFECTIVE	MST24510
2452	*	SECTOR FLAGS AND SECTOR ALTERNATION. THE TEST THEN PROCEEDS	MST24520
2453	*	AS FOLLOWS:	MST24530
2454	*		MST24540
2455	*	A. SECTOR 0 IS FORMATTED WITH DEF SEC SET.	MST24550
2456	*	B. SECTOR 2 IS FORMATTED WITH A FAULTY NORMAL	MST24560
2457	*	MODE PARITY FIELD	MST24570
2458	*	C. SECTOR 4 IS FORMATTED WITH A FAULTY	MST24580
2459	*	ADDRESS FIELD	MST24590
2460	*	D. SECTOR 6 IS FORMATTED PROPERLY	MST24600
2461	*	E. SECTOR 7 IS FORMATTED WITH A FAULTY HEAD	MST24610
2462	*	BIT	MST24620
2463	*	F. SECTOR 8 IS FORMATTED WITH THE WRITE	MST24630
2464	*	PROTECT BIT SET.	MST24640
2465	*	G. SECTOR 9 IS FORMATTED PROPERLY	MST24650
2466	*	H. SECTOR A IS FORMATTED WITH DEF SEC SET.	MST24660
2467	*	I. SECTOR B IS FORMATTED PROPERLY	MST24670
2468	*	J. SECTOR C IS FORMATTED WITH WRT PROT SET	MST24680
2469	*		MST24690
2470	*	THE FOLLOWING NORMAL MODE READS OR WRITES	MST24700
2471	*	ARE THEN PERFORMED:	MST24710
2472	*		MST24720
2473	*	A. SECTOR 0 IS READ, EXPECT DEF SEC STATUS.	MST24730
2474	*	B. SECTOR 2 IS READ, PARITY ERROR EXPECTED	MST24740
2475	*	C. SECTOR 4 IS READ, HEADER COMPARE FAILURE STATUS EXPECTED.	MST24750
2476	*	D. SECTORS 6 AND 7 ARE READ IN ONE DATA	MST24760
2477	*	TRANSFER, HEADER COMPARE FAILURE STATUS EXPECTED.	MST24770
2478	*	E. SECTOR 8 IS WRITTEN WITH PROTECTED WRITE,	MST24780
2479	*	WRITE PROTECT STATUS EXPECTED	MST24790
2480	*	F. SECTORS 9 & A ARE READ IN ONE TRANSFER	MST24800
2481	*	DEFECTIVE SECTOR STATUS IS EXPECTED.	MST24810
2482	*	G. SECTORS 9 & A ARE WRITTEN IN ONE TRANSFER	MST24820
2483	*	DEFECTIVE SECTOR STATUS IS EXPECTED.	MST24830
2484	*	H. SECTORS B & C ARE WRITTEN IN THE WRITE	MST24840
2485	*	PROTECT MODE, WRT PROTECT STATUS EXPECTED	MST24850
2486	*		MST24860

## SYSTEM TEST SEQUENCES - TEST 05

		2487	*	FINALLY, THE ADDRESS MARK FOR SECTOR X'F' IS ERASED, AND AN ATTEMPT	MST24870
		2488	*	IS MADE TO READ THE SECTOR. HEADER COMPARE FAIL IS EXPECTED.	MST24880
		2489	*	SECTOR X'0F'S HEADER IS WRITTEN TO PHYSICAL SECTOR X'3F', AND	MST24890
		2490	*	SECTOR X'F' IS READ IN NORMAL MODE, WITH NO ERROR EXPECTED.	MST24900
		2491	*		MST24910
		2492	*	PROPER FORMAT IS RESTORED ON SUCCESSFUL COMPLETION OF THE TEST.	MST24920
		2493	*		MST24930
		2494	*	HOW TO RUN THE TEST:	MST24940
		2495	*	PLACE THE CONTROLLER MODE SWITCH IN THE FORMAT (0) POSITION.	MST24950
		2496	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, AND	MST24960
		2497	*	LOCYL OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.	MST24970
		2498	*		MST24980
		2499	*	OPTIONS:	MST24990
		2500	*	SELCH, DISCON, DRIVE, BYCKAC, PACTYP, LOCYL, SECTOR (HEAD PORTION)	MST25000
		2501	*	INBUF, CUTBUF	MST25010
		2502	*		MST25020
		2503	*	ERRORS:	MST25030
		2504	*	050000 - 05FFFF	MST25040
		2505	*		MST25050
2366	41F0 1FC8	2506	TEST5	BAL RETN,MODINIT	MST25060
236A	0081	2507		DCX 0081	MST25070
		2508	*		MST25080
236C	C870 0605	2509		LHI WK1,X'0605'	MST25090
2370	4070 1900	2510		STH WK1,WCMD	MST25100
2374	4860 17DC	2511		LH WK0,CATA+6	MST25110
2378	41F0 3136	2512		BAL RETN,FMSUDF	MST25120
237C	41F0 34E6	2513		BAL R15,HEADER	MST25130
2380	2400	2514		LIS R0,0	MST25140
2382	4001 0112	2515		STH R0,PRECL-2(R1)	MST25150
		2516	*		MST25160
2386	C800 0080	2517		LHI R0,X'80'	MST25170
238A	D201 0000	2518		STB R0,0(R1)	MST25180
238E	2400	2519		LIS SECT,0	MST25190
2390	C860 0113	2520		LHI WK0,PRECL-1	MST25200
2394	4060 1964	2521		STA WK0,SIZE	MST25210
2398	41F0 32EC	2522		BAL RETN,WRIT	MST25220
		2523	*		MST25230
239C	24D2	2524		LIS SECT,2	MST25240
239E	41F0 34E6	2525		BAL R15,HEADER	MST25250
23A2	40D1 0112	2526		STH SECT,PRECL-2(R1)	MST25260
23A6	41F0 32EC	2527		BAL RETN,WRIT	MST25270
		2528	*		MST25280
23AA	4810 196C	2529		LDA R1,WTFADR	MST25290
23AE	D2D1 0000	2530		STB SECT,0(R1)	MST25300
23B2	24D4	2531		LIS SECT,4	MST25310
23B4	2400	2532		LIS R0,0	MST25320
23B6	4001 0112	2533		STH R0,PRECL-2(R1)	MST25330
23BA	41F0 32EC	2534		BAL RETN,WRIT	MST25340
		2535	*		MST25350
23BE	24D6	2536		LIS SECT,6	MST25360
23C0	41F0 34E6	2537		BAL R15,HEADER	MST25370
23C4	41F0 32EC	2538		BAL RETN,WRIT	MST25380
		2539	*		MST25390

## SYSTEM TEST SEQUENCES - TEST 05

23C8	24D7	2540	LIS	SECT,7		MST25400
23CA	4810 196C	2541	LDA	R1,WTFADR		MST25410
23CE	4800 1920	2542	LH	RO,MAXHEAD	EAC HEAD ADDRESS	MST25420
23D2	910A	2543	SLLS	RO,10		MST25430
23D4	060B	2544	OAR	RO,TRACK		MST25440
23D6	5400	2545	EXBR	RO,RO		MST25450
23D8	D201 0000	2546	STB	SECT,0(R1)		MST25460
23DC	D201 0001	2547	STB	RO,1(R1)		MST25470
23E0	02B1 0002	2548	STB	TRACK,2(R1)		MST25480
23E4	41F0 32EC	2549	BAL	RETN,WRT		MST25490
		2550	*			MST25500
23E8	24D8	2551	LIS	SECT,8	SECTOR 8	MST25510
23EA	41F0 34E6	2552	BAL	R15,HEADER	SET UP GOOD FORMAT HEADER	MST25520
23EE	C86D 0040	2553	LHI	WKO,X*40*(SECT)	WRT PROT BIT	MST25530
23F2	D261 0000	2554	STB	WKO,0(R1)		MST25540
23FE	41F0 32EC	2555	BAL	RETN,WRT		MST25550
		2556	*			MST25560
23FA	24D9	2557	LIS	SECT,9	SECTOR 9	MST25570
23FC	41F0 34E6	2558	BAL	R15,HEADER	SET GOOD HEADER	MST25580
2400	2460	2559	LIS	WKO,0	SET TO WRITE ALL ZEROS	MST25590
2402	41F0 3136	2560	BAL	RETN,FMSUDF	IN SECTOR 9	MST25600
2406	4810 196C	2561	LDA	R1,WTFADR		MST25610
240A	2400	2562	LIS	RO,0		MST25620
240C	4001 0112	2563	STH	RO,PRECL-2(R1)	SET GOOD CHECKSUM	MST25630
2410	41F0 32EC	2564	BAL	RETN,WRT		MST25640
		2565	*			MST25650
2414	24DB	2566	LIS	SECT,11	SECTOR B	MST25660
241E	41F0 34E6	2567	BAL	R15,HEADER	SET GOOD HEADER	MST25670
241A	41F0 32EC	2568	BAL	RETN,WRT	ALSO WRITE ALL ZEROS IN SECTOR B	MST25680
		2569	*			MST25690
241E	24DA	2570	LIS	SECT,10	SECTOR A	MST25700
2420	C86D 0080	2571	LHI	WKO,X*80*(SECT)	DEF SEC BIT	MST25710
2424	4810 196C	2572	LDA	R1,WTFADR		MST25720
2428	D261 0000	2573	STB	WKO,0(R1)		MST25730
242C	2561	2574	LCS	WKO,1	SET TO WRITE ALL ONES	MST25740
242E	41F0 3136	2575	BAL	RETN,FMSUDF	IN SECTOR A	MST25750
2432	4810 196C	2576	LDA	R1,WTFADR		MST25760
2436	2400	2577	LIS	RO,0		MST25770
2438	4001 0112	2578	STH	RO,PRECL-2(R1)	SET GOOD CHECKSUM	MST25780
243C	41F0 32EC	2579	BAL	RETN,WRT		MST25790
		2580	*			MST25800
2440	24DC	2581	LIS	SECT,12	SECTOR C	MST25810
2442	C86D 0040	2582	LHI	WKO,X*40*(SECT)	WRT PROT BIT	MST25820
244E	4810 196C	2583	LDA	R1,WTFADR		MST25830
244A	D261 0000	2584	STB	WKO,0(R1)		MST25840
244E	41F0 32EC	2585	BAL	RETN,WRT	ALSO WRITE ALL ONES IN SECTOR C	MST25850
		2586	*			MST25860
		2587	*			MST25870
		2588	*	NOW CHECK FUNCTION, USING SECTORS WRITTEN.		MST25880
2452	2501	2589	LCS	RO,1		MST25890
2454	4000 1982	2590	STA	RO,ERRFL6	UNCONDITIONAL RETURN	MST25900
2458	C86D 0201	2591	LHI	WKO,X*0201*		MST25910
245C	406D 190D	2592	STH	WKO,WCMD	WRITE & READ CTRLR CMDS	MST25920

## SYSTEM TEST SEQUENCES - TEST 05

2460	C860 00FF	2593	LHI	WKO,LRECL-1		MST25930
2464	4060 1964	2594	STA	WKO,SIZE		MST25940
2468	24D0	2595	LIS	SECT,0	SECTOR 0	MST25950
246A	C8C0 0093	2596	LHI	OPKEY,X'93'	=TESTING CTRLR ERROR STATUS	MST25960
246E	40C0 1936	2597	STH	OPKEY,OPCODE	(DEFECTIVE SECTOR)	MST25970
2472	41F0 32DA	2598	BAL	RETN,READX	READ, EXPECT ERROR	MST25980
2476	E120 3D8E	2599	SVC	2,PBLK08	TEST CTRLR STATUS = X'2E'	MST25990
247A	41F0 32FC	2600	EAL	RETN,WRITX		MST26000
247E	E120 3D8E	2601	SVC	2,PBLK08	ON WRITE, ALSC.	MST26010
		2602	*			MST26020
2482	24D2	2603	LIS	SECT,2	SECTOR 2	MST26030
2484	C8C0 0095	2604	LHI	OPKEY,X'95'	=TESTING CTRLR ERROR STATUS	MST26040
2488	40C0 1936	2605	STH	OPKEY,OPCODE	(DATA TRANSFER ERROR)	MST26050
248C	41F0 32DA	2606	BAL	RETN,READX	READ EXPECT ERROR	MST26060
2490	E120 3D92	2607	SVC	2,PBLK09	TEST CTRLR STATUS = X'03'	MST26070
		2608	*			MST26080
2494	24D4	2609	LIS	SECT,4	SECTOR 4	MST26090
2496	C8C0 0092	2610	LHI	OPKEY,X'92'	=TESTING CTRLR ERROR STATUS	MST26100
249A	40C0 1936	2611	STH	OPKEY,OPCODE	(HEADER ERROR)	MST26110
249E	41F0 32DA	2612	BAL	RETN,READX		MST26120
24A2	E120 3D96	2613	SVC	2,PBLK0A	TEST CTRLR STATUS = X'4E'	MST26130
24A6	41F0 32FC	2614	BAL	RETN,WRITX		MST26140
24AA	E120 3D96	2615	SVC	2,PBLK0A	ON WRITE, ALSC	MST26150
		2616	*			MST26160
24AE	24D6	2617	LIS	SECT,6	SECTOR 6 - 7	MST26170
24B0	C860 01FF	2618	LHI	WKO,2*LRECL-1	SET SIZE TO 512 BYTES	MST26180
24B4	4060 1964	2619	STA	WKO,SIZE	TWC SECTORS	MST26190
24B8	41F0 32DA	2620	BAL	RETN,READX		MST26200
24BC	E120 3D96	2621	SVC	2,PBLK0A	TEST CTRLR STATUS = X'4E'	MST26210
24C0	41F0 32FC	2622	BAL	RETN,WRITX		MST26220
24C4	E120 3D96	2623	SVC	2,PBLK0A	ON WRITE, ALSC	MST26230
		2624	*			MST26240
24C8	24D8	2625	LIS	SECT,8	SECTOR 8	MST26250
24CA	C8C0 0091	2626	LHI	OPKEY,X'91'	=TESTING CTRLR ERROR STATUS	MST26260
24CE	40C0 1936	2627	STH	OPKEY,OPCODE	(SECTOR WRITE-PROTECT VIOLATION)	MST26270
24D2	C860 1201	2628	LHI	WKO,X'1201'	WRITE PROTECT/NORMAL READ	MST26280
24DE	4060 1900	2629	STH	WKO,WCMD		MST26290
24DA	C860 00FF	2630	LHI	WKO,LRECL-1	SET SIZE TO	MST26300
24DE	4060 1964	2631	STA	WKO,SIZE	256 BYTES	MST26310
24E2	41F0 32FC	2632	BAL	RETN,WRITX		MST26320
24E6	E120 3D9A	2633	SVC	2,PBLK0B	TEST CTRLR STATUS = X'8E'	MST26330
24EA	C8C0 0070	2634	LHI	OPKEY,X'70'	=NO ERROR READ	MST26340
24EE	40C0 1936	2635	STH	OPKEY,OPCODE		MST26350
24F2	41F0 32DA	2636	BAL	RETN,READX	NO ERROR ON READ -	MST26360
24F6	E120 3DA6	2637	SVC	2,PBLK0E	TEST CTRLR STATUS = X'02'	MST26370
		2638	*			MST26380
24FA	24D9	2639	LIS	SECT,9	SECTOR 9 & A	MST26390
24FC	C860 01FF	2640	LHI	WKO,2*LRECL-1		MST26400
2500	4060 1964	2641	STA	WKO,SIZE		MST26410
2504	C8C0 0093	2642	LHI	OPKEY,X'93'	=TESTING CTRLR ERROR STATUS	MST26420
2508	40C0 1936	2643	STH	OPKEY,OPCODE	(DEFECTIVE SECTOR)	MST26430
250C	41F0 32DA	2644	BAL	RETN,READX		MST26440
2510	E120 3D8E	2645	SVC	2,PBLK08	TEST CTRLR STATUS = X'2E'	MST26450

## SYSTEM TEST SEQUENCES - TEST 05

2514	41F0 32FC	2646	BAL	RETN,WRITX	SECTOR 9 & A	MST26460
2518	E120 3D8E	2647	SVC	2,PBLK08	ON WRITE, ALSO.	MST26470
		2648	*			MST26480
251C	240B	2649	LIS	SECT,11	SECTOR B & C	MST26490
251E	C8C0 0091	2650	LHI	OPKEY,X'51'	=TESTING CTRLR ERROR STATUS	MST26500
2522	40C0 1936	2651	STH	OPKEY,OPCODE	(SECTOR WRITE-PROTECT VIOLATION)	MST26510
252E	41F0 32FC	2652	BAL	RETN,WRITX		MST26520
252A	E120 3D9A	2653	SVC	2,PBLK08	TEST CTRLR STATUS = X'8E'	MST26530
252E	41F0 32CA	2654	BAL	RETN,READ	NO ERROR ON READ	MST26540
		2655	*			MST26550
		2656	*	TEST AUTOMATIC ERROR RECOVERY LOGIC & ADDRESS MARK ERASE		MST26560
		2657	*			MST26570
2532	C800 0601	2658	LHI	RO,X'0601'	FORMAT WRITE/NORMAL READ COMMANDS	MST26580
253E	4000 1900	2659	STH	RO,WCMD		MST26590
253A	C800 0113	2660	LHI	RO,PRECL-1		MST26600
253E	4000 1964	2661	STA	RO,SIZE	SET UP FOR 1 PHYSICAL SECTOR	MST26610
2542	24DF	2662	LIS	SECT,X'F'		MST26620
2544	41F0 34E6	2663	BAL	R15,HEADER	SET SECTOR X'F' GOOD HEADER	MST26630
2548	2406	2664	LIS	RO,X'06'	FORMAT WRITE COMMAND	MST26640
254A	4000 1934	2665	STH	RO,RWOCMD		MST26650
254E	C800 0010	2666	LHI	RO,X'10'	SELCH WRITE COMMAND	MST26660
2552	D200 1911	2667	STB	RO,SLCHCMD		MST26670
255E	41F0 385A	2668	BAL	R15,SLCH	SET UP SELECTOR CHANNEL	MST26680
255A	41F0 3412	2669	BAL	R15,SETHEAD	SET HEAD TO CRIVE	MST26690
255E	C8C0 0064	2670	LHI	OPKEY,X'E4'	=ERASING ADDRESS MARK	MST26700
2562	40C0 1936	2671	STH	OPKEY,OPCODE		MST26710
256E	C800 30D2	2672	LDAI	RO,PBLK26	TO TEST CTRLR STATUS = X'02'	MST26720
256A	4000 1982	2673	STA	RO,ERRFLG		MST26730
256E	C8F0 257A	2674	LDAI	R15,TST5.1		MST26740
2572	40F0 1976	2675	STA	R15,RWSAVE	RETURN ADDRESS FOR READ/WRIT ROUTINE	MST26750
257E	41F0 3550	2676	BAL	R15,ERAMK.1	ERASE ADDRESS MARK FOR SECTOR X'F'	MST26760
		2677	*			MST26770
257A	C800 00FF	2678	LHI	RO,LRECL-1		MST26780
257E	4000 1964	2679	STA	RO,SIZE	SET UP FOR ONE LOGICAL SECTOR	MST26790
2582	2501	2680	LCS	RO,1		MST26800
2584	4000 1982	2681	STA	RO,ERRFLG	UNCONDITIONAL RETURN:	MST26810
2588	C8C0 0092	2682	LHI	OPKEY,X'92'	=TESTING CTRLR ERROR STATUS	MST26820
258C	40C0 1936	2683	STH	OPKEY,OPCODE	(HEADER FAIL)	MST26830
2590	41F0 32DA	2684	EAL	R15,READX.	READ NON-EXISTENT SECTOR F	MST26840
2594	E120 3D96	2685	SVC	2,PBLK0A	TEST CTRLR STATUS = X'4E'	MST26850
		2686	*			MST26860
2598	41F0 34E6	2687	BAL	R15,HEADER	SET UP GOOD SECTOR F HEADER,	MST26870
259C	C8D0 003F	2688	LHI	SECT,MAXSEC-1		MST26880
25A0	C8C0 0061	2689	LHI	OPKEY,X'E1'	=WRITE FORMAT	MST26890
25A4	40C0 1936	2690	STH	OPKEY,OPCODE		MST26900
25A8	C800 0113	2691	LHI	RO,PRECL-1	SET UP TO WRITE 1 PHYSICAL SECTOR	MST26910
25AC	4000 1964	2692	STA	RO,SIZE		MST26920
25B0	41F0 32FC	2693	BAL	R15,WRITX	ALTERNATE SECTOR F TO SECTOR X'3F'	MST26930
25B4	E120 3DC2	2694	SVC	2,PBLK21	TEST CTRLR STATUS = X'02'	MST26940
		2695	*			MST26950
25B8	C8C0 0070	2696	LHI	OPKEY,X'70'	=NORMAL READ	MST26960
25BC	40C0 1936	2697	STH	OPKEY,OPCODE		MST26970
25C0	C800 00FF	2698	LHI	RO,LRECL-1	SET UP TO READ 1 LOGICAL SECTOR	MST26980

SYSTEM TEST SEQUENCES - TEST 05

25C4	4000 1964	2699	STA	RD,SIZE
25C8	24DF	2700	LIS	SECT,X*F*
25CA	41F0 32DA	2701	BAL	R15,READX
25CE	E120 3DC2	2702	SVC	2,PBLK21
25D2	4300 3D20	2703	B	TESTAUT1

READ ALTERNATED SECTOR F  
TEST CTRLR STATUS = X'C2'  
RE-FORMAT TRACK, EXIT.

MST26990  
MST27000  
MST27010  
MST27020  
MST27030



SYSTEM TEST SEQUENCES - TEST 06

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2705 * *****
2706 *
2707 *           T E S T   6
2708 *
2709 * PURPOSE OF TEST:
2710 * TEST 6 PERFORMS A CHECK ON MULTI-SECTOR DATA TRANSFER, INCLUDING
2711 * HEAD SWITCHING AND CYLINDER OVERFLOW LOGIC.
2712 * TEST 6 IS THE ONLY TEST WHICH SPECIFICALLY TESTS MULTIPLE-SECTOR
2713 * HEAD ADVANCE/CYLINDER OVERFLOW LOGIC, AND HEAD SELECT ERROR.
2714 *
2715 * ASSUMPTIONS:
2716 * THE SELECTED DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
2717 * ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.
2718 * THE CYLINDER SPECIFIED BY THE LOCYL OPTION SHOULD NOT BE FORMATTED
2719 * WRITE-PROTECTED. 64 ADDRESS MARKS PER TRACK ARE ASSUMED.
2720 * SPURIOUS EXTRA ADDRESS MARKS (1) WILL CAUSE DATA COMPARE ERRORS;
2721 * OR (2) WILL NOT ALLOW CYLINDER OVERFLOW STATUS.
2722 * THE 'HEADS' OPTION *MUST* BE ZERO (0).
2723 *
2724 * DESIGN SPECIFICATIONS:
2725 * A DATA TRANSFER OF (ONE SECTOR + 6 BYTES) IS MADE TO THE HIGHEST
2726 * SECTOR ADDRESS OF HEAD 0, OF THE CYLINDER SPECIFIED BY LOCYL.
2727 * THE DATA IS READ BACK FROM HEADS 0 AND 1, AND TESTED. THE OPERATION
2728 * IS THEN REPEATED FOR THE NEXT HEAD ADDRESS. WHEN THE LAST
2729 * HEAD IS REACHED, CYLINDER OVERFLOW IS TESTED BY WRITING AND READING.
2730 * THE DATA READ IS TESTED. AN INVALID HEAD IS THEN SELECTED, WITH
2731 * HEADER COMPARE FAIL STATUS EXPECTED. THE TEST THEN TERMINATES.
2732 *
2733 * HOW TO RUN THE TEST:
2734 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE
2735 * OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.
2736 *
2737 * OPTIONS:
2738 * LOOP, CONTIN, SELCH, DISCON, CRIVE, PACTYP, RETRY,
2739 * HEADS, INBUF, OUTBUF
2740 *
2741 * ERRORS:
2742 * 060000 - 06FFFF
2743 *
2744 TEST6  BAL  RETN,MODINIT
2745          DCX  0020          NO HEADS CAN BE DELETED
2746          LH  TRACK,LOCYL+6
2747          LIS  RD,0
2748          STH  RD,HEAD      START WITH HEAD 0.
2749          BAL  R15,SKSR     SEEK LOCYL
2750          LHI  RD,X*0201'   NORMAL WRITE/READ
2751          STH  RD,WCND      SAVE COMMANDS
2752 TST6.0  LHI  SECT,MAXSEC-1
2753          LHI  RD,LRECL+5   SET SIZE = 262
2754          STA  RD,SIZE
2755          BAL  R15,SPIFILL  FILL BUFFER W/SPIRAL DATA
2756          BAL  RETN,WRIT    WRITE
2757          BAL  RETN,READ    READ

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MST27050
MST27060
MST27070
MST27080
MST27090
MST27100
MST27110
MST27120
MST27130
MST27140
MST27150
MST27160
MST27170
MST27180
MST27190
MST27200
MST27210
MST27220
MST27230
MST27240
MST27250
MST27260
MST27270
MST27280
MST27290
MST27300
MST27310
MST27320
MST27330
MST27340
MST27350
MST27360
MST27370
MST27380
MST27390
MST27400
MST27410
MST27420
MST27430
MST27440
MST27450
MST27460
MST27470
MST27480
MST27490
MST27500
MST27510
MST27520
MST27530
MST27540
MST27550
MST27560
MST27570

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25DE 41F0 1FC8
25DA C020
25DC 48B0 1758
25E0 2400
25E2 4000 194A
25E6 41F0 35F0
25EA C800 0201
25EE 4000 1900
25F2 C800 003F
25F6 C800 0105
25FA 4000 1964
25FE 41F0 31FA
2602 41F0 32EC
2606 41F0 32CA

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## SYSTEM TEST SEQUENCES - TEST 06

260A	41F0 3274	2758	BAL	RETN,TDATA		MST27580
260E	41F0 3728	2759	BAL	R15,NEWHEAD	GET NEXT HEAD	MST27590
2612	2614	2760	CAC	TST6.1	CONTINUATION VECTOR	MST27600
2614	24D0	2761	LIS	SECT,0		MST27610
2616	2405	2762	LIS	RO,5		MST27620
2618	4000 1964	2763	STA	RO,SIZE		MST27630
261C	41F0 32CA	2764	BAL	RETN,READ	READ ON HEAD 1	MST27640
2620	41F0 3264	2765	BAL	RETN,TDATA	TEST DATA READ ON HEAD 1	MST27650
2624	0100	2766	DCX	0100	BYTE OFFSET	MST27660
262E	4800 194A	2767	LH	RO,HEAD		MST27670
262A	2602	2768	AIS	RO,2		MST27680
262C	4500 1920	2769	CLH	RO,MAXHEAD	WILL GIVE CYL OVERFLOW ?	MST27690
2630	4280 25F2	2770	BL	TST6.0	BRANCH: NO.	MST27700
		2771	*			MST27710
2634	C800 0105	2772	LHI	RO,LRECL+5	SET SIZE BACK TO	MST27720
2638	4000 1964	2773	STA	RO,SIZE	TC 262 BYTES	MST27730
263C	C800 003F	2774	LHI	SECT,MAXSEC-1	LAST SECTOR IN CYLINDER	MST27740
2640	4800 1920	2775	LH	RO,MAXHEAD		MST27750
2644	2701	2776	SIS	RO,1		MST27760
264E	4000 194A	2777	STH	RO,HEAD	RE-INITIALIZE TO MAX VALID	MST27770
264A	2501	2778	LCS	RO,1		MST27780
264C	4000 1982	2779	STA	RO,ERRFLG	UNCONDITIONAL RETURN	MST27790
2650	C8C0 0094	2780	LHI	OPKEY,X'94'	=TESTING CTRLR ERROR STATUS	MST27800
2654	40C0 1936	2781	STH	OPKEY,OPCODE	(CYLINDER OVERFLOW)	MST27810
2658	41F0 32FC	2782	BAL	RETN,WRITX	WRITE, EXPECT ERROR	MST27820
265C	E120 3D9E	2783	SVC	2,PBLKOC	TEST CTRLR STATUS = X'1E'	MST27830
2660	41F0 32DA	2784	BAL	RETN,READX	READ,EXPECT ERROR	MST27840
2664	E120 3D9E	2785	SVC	2,PBLKOC	CN READ, ALSC.	MST27850
2668	2506	2786	LCS	RO,6	SET SIZE BACK TO LRECL-1	MST27860
266A	6100 1964	2787	AAM	RO,SIZE	WRITTEN (WE HOPE)	MST27870
266E	41F0 32CA	2788	BAL	RETN,READ		MST27880
2672	41F0 3274	2789	BAL	RETN,TDATA	AND TEST DATA	MST27890
		2790	*			MST27900
267E	4800 1920	2791	LH	RO,MAXHEAD		MST27910
267A	4000 194A	2792	STH	RO,HEAD	INVALID HEAD ADDRESS	MST27920
267E	24D0	2793	LIS	SECT,0		MST27930
2680	2501	2794	LCS	RO,1		MST27940
2682	4000 1982	2795	STA	RO,ERRFLG	UNCONDITIONAL RETURN -	MST27950
2686	C8C0 0092	2796	LHI	OPKEY,X'92'	=TESTING CTRLR ERROR STATUS	MST27960
268A	40C0 1936	2797	STH	OPKEY,OPCODE	(HEADER ERROR)	MST27970
268E	41F0 32FC	2798	BAL	RETN,WRITX	EXPECT HEADER ERROR.	MST27980
2692	E120 3D9E	2799	SVC	2,PBLKOA	TEST CTRLR STATUS = X'4E'	MST27990
269E	41F0 32DA	2800	BAL	RETN,READX	CN READ,ALSO.	MST28000
269A	E120 3D9E	2801	SVC	2,PBLKOA		MST28010
269E	4300 0E32	2802	B	TSTEND		MST28020

SYSTEM TEST SEQUENCES - TEST 07

		2804	* *****			MST28040
		2805	* TEST 7			MST28050
		2806	* TEST 7			MST28060
		2807	* TEST 7			MST28070
		2808	* PURPOSE OF TEST:			MST28080
		2809	* TEST 7 CHECKS DATA TRANSFER INTERRUPT LOGIC, AND SELECTOR CHANNEL			MST28090
		2810	* DISC CONTROLLER INTERRUPT SEQUENCING.			MST28100
		2811	* THIS TEST MAY BE USED TO TEST LARGE TRANSFERS (UP TO A FULL CYLINDER),			MST28110
		2812	* IF ADEQUATE MEMORY IS AVAILABLE. THIS IS DONE BY MANUALLY CHANGING			MST28120
		2813	* LOCATION 'IDSIZE' TO THE REQUIRED TRANSFER LENGTH. IF A WRITE TO THE			MST28130
		2814	* DISC IS DESIRED, THE COMMANDS AT LOCATION 'IDDC' MUST BE CHANGED TO			MST28140
		2815	* X*4210*. TESTS 7 AND 15 ARE THE ONLY TESTS ALLOWING GREATER THAN			MST28150
		2816	* ONE TRACK IN ANY SINGLE TRANSFER.			MST28160
		2817	* ASSUMPTIONS:			MST28170
		2818	* THE SELECTED DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE			MST28180
		2819	* ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.			MST28190
		2820	* DESIGN SPECIFICATIONS:			MST28200
		2821	* THE SELECTED DRIVE IS INTERRUPT-SEEKED TO LOCYL. 256 DATA BYTES ARE			MST28210
		2822	* READ UNDER INTERRUPT CONTROL, FROM THE HEAD AND SECTOR SPECIFIED			MST28220
		2823	* BY THE 'SECTOR' OPTION. THE SELCH IS EXPECTED TO INTERRUPT FIRST,			MST28230
		2824	* FOLLOWED BY THE CONTROLLER.			MST28240
		2825	* HOW TO RUN THE TEST:			MST28250
		2826	* ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE			MST28260
		2827	* OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.			MST28270
		2828	* OPTIONS:			MST28280
		2829	* LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, SECTOR, RETRY, INBUF			MST28290
		2830	* ERRORS:			MST28300
		2831	* 070000 - 07FFFF			MST28310
		2832	* TEST 7			MST28320
26A2	41F0 1FC8	2833	BAL	RETN,MODINIT		MST28330
26A6	0000	2834	DCX	0000	NO SPECIAL FLAGS	MST28340
26A8	41E0 3892	2835	BAL	R14,INSERT	INSERT DRIVE INTPT. VECTOR:	MST28350
26AC	1952	2836	DC	Z(FUTACRS),Z(SKINTA)		MST28360
26AE	31D0	2837	* TEST 7			MST28370
26B0	C8C0 0020	2838	LHI	OPKEY,X*20*		MST28380
26B4	40C0 1936	2839	STH	OPKEY,OPCODE	=SEEK OPERATION	MST28390
26B8	48B0 1758	2840	LH	TRACK,LOCYL*6		MST28400
26BC	41E0 31A8	2841	BAL	RETN2,INTSK	SEEK	MST28410
		2842	* TEST 7			MST28420
26C0	41E0 3892	2843	BAL	R14,INSERT	DELETE DRIVE	MST28430
26C4	1952	2844	DC	Z(FUTACRS),Z(0)		MST28440
26C6	0000	2845	* TEST 7			MST28450
26C8	4190 3620	2846	BAL	WK3,TSECTA	GET STARTING HEAD, SECTOR	MST28460
26CC	4800 1966	2847	LDA	RO,IDSIZE	GET TRANSFER SIZE	MST28470
26D0	C600 0001	2848	OHI	RO,1	FORCE GCD	MST28480
26D4	4000 1964	2849	STA	RO,SIZE		MST28490
26D8	C800 3DA6	2850	LDAl	RO,PBLKOE		MST28500
26DC	4000 1982	2851	STA	RO,ERRFLG	FOR ERROR ROUTINE	MST28510
		2852	* TEST 7			MST28520
		2853	* TEST 7			MST28530
		2854	* TEST 7			MST28540

## SYSTEM TEST SEQUENCES - TEST 07

		2855	*				MST28550
26E0	D300 191D	2856		LB	R0, IDDC+1	SELCH COMMAND	MST28560
26E4	D200 1911	2857		STB	R0, SLCHCMD		MST28570
26E8	41F0 385A	2858		BAL	RETN, SLCH	WRITE ADDRESSES TO SELCH	MST28580
26EC	41F0 3502	2859		BAL	R15, CHDR	WRITE HEADER TO CTRLR	MST28590
26F0	41F0 3412	2860		BAL	R15, SETHEAD		MST28600
26F4	C8C0 0070	2861		LHI	OPKEY, X'70'		MST28610
26F8	40C0 1936	2862		STH	OPKEY, OPCODE	=NO ERROR READ	MST28620
26FC	DE30 191C	2863		OC	DCAD, IDDC	CCNT CMD (X'41')	MST28630
2700	DE40 191D	2864		OC	SLAD, IDDC+1	SELCH CMD (X'30')	MST28640
2704	41E0 3892	2865		BAL	R14, INSERT	INSERT SELCH INTPT VECTOR:	MST28650
2708	1794	2866		DC	Z(SELCH+6), Z(IDTSW)		MST28660
270A	2718						
270C	41F0 2710	2867		BAL	R15, INDT	(SET UP R15 FOR ERROR MSG)	MST28670
2710	C800 0100	2868	INDT	LHI	R0, 256	TIMEOUT CONSTANT	MST28680
2714	41E0 31E8	2869		BAL	R14, ITMLP	WAIT FOR INTERRUPT	MST28690
		2871	*	INTERRUPT HANDLERS			MST28710
2718	C8C0 0070	2873	IDTSW	LHI	OPKEY, X'70'	=READ	MST28730
271C	40C0 1936	2874		STH	OPKEY, OPCODE		MST28740
2720	E100 3DA2	2875		SVC	0, PBLK0D	TEST SELCH NOT BUSY (INTPT)	MST28750
2724	E110 3DA2	2876		SVC	1, PBLK0D	(SENSE STATUS)	MST28760
2728	41E0 3892	2877		BAL	R14, INSERT	DELETE SELCH	MST28770
272C	1794	2878		DC	Z(SELCH+6), Z(0)		MST28780
272E	0000						
2730	41E0 3818	2879		BAL	RETN2, SLCHK		MST28790
2734	41E0 3892	2880		BAL	R14, INSERT	INSERT CTRLR INTPT VECTOR:	MST28800
2738	17A0	2881		DC	Z(DISCON+6), Z(IDTSW2)		MST28810
273A	2740						
273C	41F0 2710	2882		BAL	R15, INDT	GO ENABLE INTERRUPTS	MST28820
2740	C8C0 0070	2884	IDTSW2	LHI	OPKEY, X'70'	=READ	MST28840
2744	40C0 1936	2885		STH	OPKEY, OPCODE		MST28850
2748	E100 3DA6	2886		SVC	0, PBLK0E	TEST CTRLR STATUS = X'02' (INTPT)	MST28860
274C	E120 3DA6	2887		SVC	2, PBLK0E	TEST AGAIN (SENSE STATUS)	MST28870
2750	4300 0E32	2888		B	TSTEND		MST28880

## SYSTEM TEST SEQUENCES - TESTS 08, 09, 0A

2890	*	*****	MST28900
2891	*		MST28910
2892	*	TEST 8	MST28920
2893	*		MST28930
2894	*	PURPOSE OF TEST:	MST28940
2895	*	TEST 8 CHECKS NORMAL-MODE READ/WRITE OPERATIONS WITH ALL POSSIBLE	MST28950
2896	*	BIT PATTERNS (SPIRAL DATA).	MST28960
2897	*		MST28970
2898	*	ASSUMPTIONS:	MST28980
2899	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE	MST28990
2900	*	ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.	MST29000
2901	*	64 ADDRESS MARKS PER TRACK ARE ASSUMED.	MST29010
2902	*		MST29020
2903	*	DESIGN SPECIFICATIONS:	MST29030
2904	*	THE DATA BUFFER IS FILLED WITH SPIRAL DATA. THE DATA IS WRITTEN	MST29040
2905	*	THE LOWEST VALID HEAD ADDRESS NOT DELETED BY THE 'HEADS' OPTION,	MST29050
2906	*	OF THE CYLINDER SPECIFIED BY LOCYL. THE DATA IS THEN READ EACH	MST29060
2907	*	AND TESTED. THE PROCESS IS REPEATED FOR ALL HEADS NOT DELETED,	MST29070
2908	*	FOR ALL CYLINDERS THROUGH HICYL.	MST29080
2909	*		MST29090
2910	*	HOW TO RUN THE TEST:	MST29100
2911	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, HEADS,	MST29110
2912	*	LOCYL, AND HICYL OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION	MST29120
2913	*	IS NECESSARY.	MST29130
2914	*		MST29140
2915	*	OPTIONS:	MST29150
2916	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, HEADS, LOCYL, HICYL, PACTYP,	MST29160
2917	*	RETRY, SECNUM, OUTBUF, INBUF	MST29170
2918	*		MST29180
2919	*	ERRORS:	MST29190
2920	*	080000 - 08FFFF	MST29200
2921	*		MST29210
2754	C800	27A2	MST29220
2758	2306		MST29230
2922	TEST8	LDAI R0, SPIRAL	
2923		BS SWRST	
2925	*	*****	MST29250
2926	*		MST29260
2927	*	TEST 9	MST29270
2928	*		MST29280
2929	*	PURPOSE OF TEST:	MST29290
2930	*	TEST 9 CHECKS NORMAL-MODE READ/WRITE OPERATIONS WITH A USER-SPECIFIED	MST29300
2931	*	WORST-CASE DATA PATTERN.	MST29310
2932	*		MST29320
2933	*	ASSUMPTIONS:	MST29330
2934	*	THE SELECTED DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE	MST29340
2935	*	ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.	MST29350
2936	*	64 ADDRESS MARKS PER TRACK ARE ASSUMED.	MST29360
2937	*		MST29370
2938	*	DESIGN SPECIFICATIONS:	MST29380
2939	*	THE DATA BUFFER IS FILLED WITH WORST-CASE DATA, SPECIFIED BY THE	MST29390
2940	*	'DATA' OPTION. THIS DATA IS WRITTEN TO THE LOWEST VALID HEAD ADDRESS	MST29400

## SYSTEM TEST SEQUENCES - TESTS 08, 09, 0A

	2941	* NOT DELETED BY THE 'HEADS' OPTION, OF THE CYLINDER SPECIFIED BY	MST29410
	2942	* LOCYL. THE DATA IS THEN READ BACK AND TESTED. THE PROCESS IS REPEATED	MST29420
	2943	* FOR ALL HEADS NOT DELETED, FOR ALL CYLINDERS THROUGH HICYL.	MST29430
	2944	*	MST29440
	2945	* HOW TO RUN THE TEST:	MST29450
	2946	* ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, HEADS,	MST29460
	2947	* LOCYL, AND HICYL OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION	MST29470
	2948	* IS NECESSARY.	MST29480
	2949	*	MST29490
	2950	* OPTIONS:	MST29500
	2951	* LOOP, CONTIN, SELCH, DISCON, DRIVE, HEADS, LOCYL, HICYL, PACTYP,	MST29510
	2952	* RETRY, SECNUM, DATA, OUTBUF, INBUF	MST29520
	2953	*	MST29530
	2954	* ERRORS:	MST29540
	2955	* 090000 - 09FFFF	MST29550
	2956	*	MST29560
275A	C800	27A8	
275E	2303		
	2957	TEST9 LDAI RO,WORCAS	MST29570
	2958	BS SWRTST	MST29580
	2960	* *****	MST29600
	2961	*	MST29610
	2962	* T E S T A	MST29620
	2963	* PURPOSE OF TEST:	MST29630
	2964	* TEST A CHECKS NORMAL-MODE READ/WRITE OPERATIONS WITH A PSELCO-RANDOM	MST29640
	2965	* DATA PATTERN.	MST29650
	2966	*	MST29660
	2967	* ASSUMPTIONS:	MST29670
	2968	* THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE	MST29680
	2969	* ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.	MST29690
	2970	* 64 ADDRESS MARKS PER TRACK ARE ASSUMED.	MST29700
	2971	*	MST29710
	2972	* DESIGN SPECIFICATIONS:	MST29720
	2973	* THE DATA BUFFER IS FILLED WITH PSEUDO-RANDOM DATA, GENERATED BY	MST29730
	2974	* A FIBONACCI SEQUENCE. THIS DATA IS WRITTEN TO THE LOWEST VALID HEAD	MST29740
	2975	* ADDRESS NOT DELETED BY THE 'HEADS' OPTION, OF THE CYLINDER SPECIFIED	MST29750
	2976	* BY LOCYL. THE DATA IS THEN READ BACK AND TESTED. THE PROCESS IS	MST29760
	2977	* REPEATED FOR ALL HEADS NOT DELETED, FOR ALL CYLINDERS THROUGH HICYL.	MST29770
	2978	*	MST29780
	2979	* HOW TO RUN THE TEST:	MST29790
	2980	* ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, HEADS,	MST29800
	2981	* LOCYL, AND HICYL OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION	MST29810
	2982	* IS NECESSARY.	MST29820
	2983	*	MST29830
	2984	* OPTIONS:	MST29840
	2985	* LOOP, CONTIN, SELCH, DISCON, DRIVE, HEADS, LOCYL, HICYL, PACTYP,	MST29850
	2986	* RETRY, SECNUM, OUTBUF, INBUF	MST29860
	2987	*	MST29870
	2988	* ERRORS:	MST29880
	2989	* 0A0E00 - 0AFFFF	MST29890
	2990	*	MST29900
2760	C800	27AE	
	2991	TESTA LDAI RO,RANDA1	MST29910

## SYSTEM TEST SEQUENCES - TESTS 08, 09, 0A

			2992	-----COMMON PROCESS STARTS HERE			MST29920	
2764	4000	1972	2993	SWRTST	STA	RO,SW1SAV	SET SWITCH 1	MST29930
2768	41F0	1FC8	2994		BAL	RETN,MODINIT		MST29940
276C	0002		2995		DCX	0002	WILL NOT ABORT ON ERRORS	MST29950
276E	41F0	3574	2996		BAL	R15,XFERSIZL	SET UP 'SIZE'	MST29960
2772	C800	0201	2997		LHI	RO,X'0201'	ACRML REAC/WRITE	MST29970
2776	4000	1900	2998		STH	RO,WCMD	M	MST29980
277A	4880	1758	2999		LH	TRACK,LOCYL*6	GET LOW TRACK	MST29990
277E	C800	27D2	3000	SWRSEK	LDAI	RO,RCLDON		MST30000
2782	4000	197E	3001		STA	RO,RERN	RERUN ADRS FOR SEEK ERRORS	MST30010
2786	41F0	3384	3002		BAL	RETN,ILLADD		MST30020
278A	27D2		3003		DAC	RCLDON	BYPASS DESTINATION	MST30030
278C	41F0	35F0	3004		BAL	RETN,SKSR	SEEK CYLINDER	MST30040
2790	41F0	3730	3005		BAL	R15,FIRSTHD	GET 1ST NON-CELETED HEAD	MST30050
2794	279A		3006		CAC	HADV1	CONTINUATION VECTOR	MST30060
2796	4300	1DCA	3007		B	ERROR16	INVALID 'HEADS' OPTION	MST30070
279A	2400		3008	HADV1	LIS	SECT,0		MST30080
279C	4800	1972	3009	SWRSW1	LDA	RO,SW1SAV	LOAD TRANSFER ADDRESS,	MST30090
27A0	0300		3010		BR	RO	TRANSFER.	MST30100
27A2	41F0	31F8	3012	SPIRAL	BAL	R15,SPIFILL	FILL BUFFER WITH SPIRAL DATA.	MST30120
27A6	2306		3013		BS	RANDA3		MST30130
27A8	41F0	3212	3015	WORCAS	BAL	R15,WCASFILL	FILL BUFFER WITH WORST-CASE DATA	MST30150
27AC	2303		3016		BS	RANDA3		MST30160
27AE	41F0	322A	3018	RANDA1	BAL	R15,RANDFILL	FILL BUFFER WITH RANDOM DATA	MST30180
27B2	C800	27C6	3020	RANDA3	LDAI	RO,RANDA4		MST30200
27B6	4000	197E	3021		STA	RO,RERN	RERUN ADRS FOR WRITE/READ ERRORS	MST30210
27BA	41F0	32EC	3022		BAL	RETN,WRIT		MST30220
27BE	41F0	32CA	3023		BAL	RETN,READ	READ	MST30230
27C2	41F0	3274	3024		BAL	RETN,TDATA	TEST DATA	MST30240
27C6	41F0	3712	3025	RANDA4	BAL	R15,NEWSEC	GET NEXT SECTOR NUMBER	MST30250
27CA	279C		3026		DAC	SWRSW1	CONTINUATION BRANCH	MST30260
27CC	41F0	3728	3027		BAL	R15,NEWHEAD	GET NEXT HEAD NUMBER	MST30270
27D0	279A		3028		DAC	HADV1	CONTINUATION	MST30280
27D2	41F0	3770	3029	RCLDON	BAL	R15,NEWCYL	GET NEXT CYLINDER	MST30290
27D6	277E		3030		DAC	SWRSEK	CONTINUATION	MST30300
27D8	4300	0E32	3031		B	TSTEND	EXIT	MST30310

## SYSTEM TEST SEQUENCES - TEST 08

		3033	*	*****		MST30330
		3034	*			MST30340
		3035	*	T E S T B		MST30350
		3036	*			MST30360
		3037	*	PURPOSE OF TEST:		MST30370
		3038	*	TEST E CHECKS THOSE STATUS BITS WHICH CANNOT BE TESTED WITHOUT		MST30380
		3039	*	MANUAL INTERVENTION.		MST30390
		3040	*			MST30400
		3041	*	ASSUMPTIONS:		MST30410
		3042	*	THE SELECTED DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE		MST30420
		3043	*	ALTERNATE CHANNEL.		MST30430
		3044	*			MST30440
		3045	*	DESIGN SPECIFICATIONS:		MST30450
		3046	*	THIS TEST CHECKS DRIVE AND CONTROLLER STATUS FOLLOWING OPERATOR		MST30460
		3047	*	RESPONSE TO PRINTED MESSAGES. IF THE PROPER STATUS IS NOT RETURNED		MST30470
		3048	*	BEFORE DELAY TIME-OUT, AN ERROR IS LOGGED, AND THE		MST30480
		3049	*	TEST ADVANCES TO THE NEXT SEQUENCE.		MST30490
		3050	*			MST30500
		3051	*	HOW TO RUN THE TEST:		MST30510
		3052	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, AND		MST30520
		3053	*	TIMVAL OPTICNS, AND ENTER 'RUN'. FOLLOW DIRECTIONS DISPLAYED ON		MST30530
		3054	*	THE CONSOLE DEVICE. IF THE DISC DRIVE IS NOT EQUIPPED WITH		MST30540
		3055	*	A 'PROTECT' SWITCH, DEPRESS BREAK TO EXIT THE TEST.		MST30550
		3056	*			MST30560
		3057	*	OPTIONS:		MST30570
		3058	*	LOOP, CONTIN, DISCON, DRIVE, RETRY, TIMVAL		MST30580
		3059	*			MST30590
		3060	*	ERRORS:		MST30600
		3061	*	080000 - 08FFFF		MST30610
		3062	*			MST30620
		3063	TESTB	BAL	RETN,MODINIT	MST30630
27DC	41F0	1FC8				
27E0	0000		3064	DCX	0000	NO SPECIAL FLAGS.
27E2	41F0	1334	3065	BAL	LINK,SETKB	MST30650
27E6	E150	1A4C	3066	SVC	5,MSG07	'TAKE DRIVE OFF-LINE'
27EA	41F0	28AC	3067	BAL	R15,SETLST	MST30670
27EE	4050	1648	3068	STH	FUT,ERRDEV	FOR PRINTOUT
27F2	C8C0	00A6	3069	LHI	OPKEY,X'A6'	=TESTING DRIVE ERROR STATUS
27F6	40C0	1936	3070	STH	OPKEY,OPCODE	(CRIVE OFF-LINE)
27FA	C870	7FFF	3071	LHI	WK1,X'7FFF'	MST30710
27FE	41E0	34BE	3072	MAN1	EAL	RETN2,MILSEC
2802	41F0	128A	3073	BAL	RETN,TSTBRK	WAIT A MILLISECOND
2806	DE50	1907	3074	OC	FUT,CLEAR	MST30740
280A	DE30	1908	3075	OC	DCAD,RESET	MST30750
280E	9D5A		3076	SSR	FUT,STAT	DISC UNAVAILABLE
2810	2219		3077	BFBS	OFFLINE,MAN1	MST30770
2812	E130	3DAA	3078	SVC	3,PBLKOF	TEST DRIVE STATUS = X'09'
			3079	*		MST30790
281E	41F0	1334	3080	BAL	LINK,SETKB	MST30800
281A	E150	1A60	3081	SVC	5,MSG09	'PUT DRIVE ON-LINE'
281E	41F0	28AC	3082	BAL	R15,SETLST	MST30820
2822	24C0		3083	LIS	OPKEY,0	MST30830
2824	40C0	1936	3084	STH	OPKEY,OPCODE	=TESTING INITIAL STATUS
2828	C870	7FFF	3085	LHI	WK1,X'7FFF'	MST30850



## SYSTEM TEST SEQUENCES - TEST 08

282C	41E3 34BE	3086	MAN2	BAL	RETN2,MILSEC	WAIT A MILLISECOND	MST30860
2830	2671	3087		AIS	WK1,1	FULL DOWN/UP CYCLE REQ'D:	MST30870
2832	41E9 34BE	3088		BAL	RETN2,MILSEC	ADDITIONAL DELAY.	MST30880
2836	41F0 128A	3089		BAL	RETN,1STBRK		MST30890
283A	CE50 1907	3090		OC	FUT,CLEAR		MST30900
283E	DE30 1908	3091		OC	DCAD,RESET		MST30910
2842	9D5A	3092		SSR	FUT,STAT	DRIVE STATUS	MST30920
2844	201C	3093		BTBS	OFFLINE,MAN2		MST30930
2846	E130 3D7E	3094		SVC	3,PBLK04	TEST DRIVE STATUS = X'00'	MST30940
		3095	*				MST30950
284A	41F0 1334	3096		BAL	LINK,SETKB		MST30960
284E	E150 1A88	3097		SVC	5,MSG12	*SET WRITE-PROTECT ON*	MST30970
2852	41F0 28AC	3098		BAL	R15,SETLST		MST30980
2856	C8C0 00A1	3099		LHI	OPKEY,X'A1'	=TESTING DRIVE ERROR STATUS	MST30990
285A	40C0 1936	3100		STH	OPKEY,OPCODE	(DRIVE WRITE-PROTECTED)	MST31000
285E	C870 7FFF	3101		LHI	WK1,X'7FFF'		MST31010
2862	41E0 34BE	3102	MAN3	BAL	RETN2,MILSEC	WAIT A MILLISECOND	MST31020
2866	41F0 128A	3103		BAL	RETN,1STBRK		MST31030
286A	CE30 1908	3104		OC	DCAD,RESET		MST31040
286E	9D5A	3105		SSR	FUT,STAT		MST31050
2870	C3A0 0080	3106		THI	STAT,WRTprt		MST31060
2874	2239	3107		BZS	MAN3		MST31070
2876	E130 3DBA	3108		SVC	3,PBLK18	TEST DRIVE STATUS = X'84'	MST31080
		3109	*				MST31090
287A	41F0 1334	3110		BAL	LINK,SETKB		MST31100
287E	E150 1A72	3111		SVC	5,MSG10	*SET WRITE-PROTECT OFF*	MST31110
2882	41F0 28AC	3112		BAL	R15,SETLST		MST31120
2886	2400	3113		LIS	R0,0		MST31130
2888	40C0 1936	3114		STH	OPKEY,OPCODE	=TESTING INITIAL STATUS	MST31140
288C	C870 7FFF	3115		LHI	WK1,X'7FFF'		MST31150
2890	41E0 34BE	3116	MAN4	BAL	RETN2,MILSEC	WAIT A MILLISECOND	MST31160
2894	41F0 128A	3117		BAL	R15,1STBRK		MST31170
2898	CE30 1908	3118		OC	DCAD,RESET		MST31180
289C	9D5A	3119		SSR	FUT,STAT		MST31190
289E	C3A0 0080	3120		THI	STAT,WRTprt		MST31200
28A2	2039	3121		BNZS	MAN4		MST31210
28A4	E130 3D7E	3122		SVC	3,PBLK04	TEST DRIVE STATUS = X'00'	MST31220
28A8	4300 0E32	3123		B	1STEND	TC EXEC	MST31230
28AC	4800 0A10	3125	SETLST	LH	R0,I0		MST31250
28B0	4000 3DF0	3126		STH	R0,IOSAVE	RESTORE USER'S LIST DEVICE	MST31260
28B4	030F	3127		BR	R15	RETURN.	MST31270

## SYSTEM TEST SEQUENCES - TEST 0C

	3129	*	*****			MST31290	
	3130	*				MST31300	
	3131	*	TEST C			MST31310	
	3132	*				MST31320	
	3133	*	PURPOSE OF TEST:			MST31330	
	3134	*	TEST C CHECKS OVERLAPPING SEEK FUNCTIONS, QUEUEING OF SEEK			MST31340	
	3135	*	INTERRUPTS, AND MULTIPLE-SECTOR NORMAL-MODE DATA TRANSFERS BETWEEN			MST31350	
	3136	*	THE DRIVES SELECTED BY THE DRIVE AND XFILE OPTIONS.			MST31360	
	3137	*				MST31370	
	3138	*	ASSUMPTIONS:			MST31380	
	3139	*	TWO MSM DRIVES OF THE SAME TYPE MUST BE ATTACHED TO THE DISC			MST31390	
	3140	*	CONTROLLER. BOTH DRIVES MUST BE ON-LINE, AND NOT RESERVED TO THE			MST31400	
	3141	*	ALTERNATE CHANNEL. BOTH DISC PACKS MUST BE PROPERLY FORMATTED.			MST31410	
	3142	*	THE DRIVE AND XFILE OPTIONS MUST NOT BE EQUAL TO ONE ANOTHER.			MST31420	
	3143	*	64 ADDRESS MARKS PER SECTOR ARE ASSUMED.			MST31430	
	3144	*				MST31440	
	3145	*	DESIGN SPECIFICATIONS:			MST31450	
	3146	*	BOTH DRIVES ARE RESTORED, THEN XFILE IS INTERRUPT-SEEKED TO THE			MST31460	
	3147	*	MAXIMUM VALID CYLINDER ADDRESS, AND DRIVE IS INTERRUPT-SEEKED TO			MST31470	
	3148	*	CYLINDER 1. WHEN DRIVE INTERRUPTS, THE STATUS IS CHECKED, AND			MST31480	
	3149	*	THE PROGRAM WAITS FOR XFILE TO INTERRUPT. WHEN XFILE INTERRUPTS,			MST31490	
	3150	*	XFILE IS SEEKED TO LOCYL. THE WRITE BUFFER IS THEN FILLED			MST31500	
	3151	*	WITH RANDOM DATA, WHICH IS WRITTEN/READ/CHECKED ON LOCYL			MST31510	
	3152	*	OF DRIVE, THEN XFILE; THIS LAST SEQUENCE IS REPEATED X*100* TIMES.			MST31520	
	3153	*				MST31530	
	3154	*	HOW TO RUN THE TEST:			MST31540	
	3155	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, AND			MST31550	
	3156	*	XFILE OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.			MST31560	
	3157	*				MST31570	
	3158	*	OPTIONS:			MST31580	
	3159	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, XFILE, PACTYP, RETRY, SECNUM			MST31590	
	3160	*	SECTOR, LOCYL, INBUF, OUTBUF			MST31600	
	3161	*				MST31610	
	3162	*	ERRORS:			MST31620	
	3163	*	0C0000 - 0CFFFF			MST31630	
	3164	*				MST31640	
	28B6	41F0	1FC8	TESTC	BAL	RETN,MODINIT	MST31650
	28BA	0008			DCX	0008	MST31660
	28BC	4850	1952		LH	FUT,FUTACRS	MST31670
	28C0	4050	1930		STH	FUT,STATE	MST31680
	28C4	41F0	3662		BAL	R15,RESTORE	MST31690
	28C8	4850	1954		LH	FUT,SECFILAD	MST31700
	28CC	4050	1930		STH	FUT,STATE	MST31710
	28D0	41F0	3662		BAL	R15,RESTORE	MST31720
	28D4	48B0	191E		LH	TRACK,MAXCYL	MST31730
	28D8	27B1			SIS	TRACK,1	MST31740
	28DA	41F0	33FC		BAL	R15,SETCYL	MST31750
	28DE	41F0	3642		BAL	R15,DISPLAY	MST31760
	28E2	C8C0	0020		LHI	OPKEY,X*20*	MST31770
	28E6	40C0	1936		STH	OPKEY,OPCODE	MST31780
	28EA	DE50	1908		OC	FUT,ISKCMD	MST31790
	28EE	41E0	3456		BAL	R14,CWAIT	MST31800
	28F2	000F			DCX	000F	MST31810

SECONDARY DRIVE TO BE USED

RESTORE DRIVE

\*STATE\* = SECONDARY DRIVE  
RESTORE XFILE

=SEEK OPERATION

INTPT SEEK XFILE MAXCYL-1  
WAIT FOR CONTROLLER IDLE

## SYSTEM TEST SEQUENCES - TEST 0C

28F4	2481	3182	LIS	TRACK,1	GET CYL=1	MST31820
28F6	4850 1952	3183	LH	FUT,FUTADRS		MST31830
28FA	4050 1930	3184	STH	FUT,STATE	STATE = PRIMARY DRIVE	MST31840
28FE	41F0 33FC	3185	BAL	R15,SETCYL		MST31850
2902	CE50 190B	3186	OC	FUT,ISKCMD	INTPT SEEK DRIVE CYL #1.	MST31860
2906	41E0 3892	3187	BAL	R14,INSERT	INSERT DRIVE INTPT VECTOR:	MST31870
290A	1952	3188	DC	Z(FUTADRS),Z(MDINT1)		MST31880
290C	2912					
290E	41E0 31BC	3189	BAL	RETN2,INTSK2	WAIT FOR INTERRUPT	MST31890
		3191	* SEEK INTERRUPT HANDLER FOR PRIMARY FILE INTERRUPT			MST31910
2912	E100 3D7E	3192	MDINT1	SVC 0,PBLK04	TEST DRIVE STATUS = X'00' (INTPT)	MST31920
2916	E130 3D7E	3193		SVC 3,PBLK04	TEST AGAIN (SENSE STATUS)	MST31930
291A	C800 00B4	3194		LHI R0,180		MST31940
291E	41F0 10BA	3195		BAL R15,TIMER	KEEP XFILE INTERRUPT QUEUED	MST31950
2922	41E0 3892	3196		BAL R14,INSERT	INSERT XFILE INTPT VECTOR:	MST31960
2926	1954	3197		DC Z(SECFILAD),Z(MDINT2)		MST31970
2928	2936					
292A	4850 1954	3198	LH	FUT,SECFILAD		MST31980
292E	4050 1930	3199	STH	FUT,STATE	'STATE' = SECONDARY DRIVE	MST31990
2932	41E0 31BC	3200	BAL	RETN2,INTSK2	WAIT FOR INTERRUPT.	MST32000
		3202	* SEEK INTERRUPT HANDLER FOR SECONDARY FILE INTERRUPT			MST32020
2936	E100 3D7E	3203	MDINT2	SVC 0,PBLK04	TEST XFILE STATUS = X'00' (INTPT)	MST32030
293A	E130 3D7E	3204		SVC 3,PBLK04	TEST AGAIN (SENSE STATUS)	MST32040
293E	41E0 3892	3205		BAL R14,INSERT	DELETE XFILE INTPT VECTOR:	MST32050
2942	1954	3206		DC Z(SECFILAD),Z(0)		MST32060
2944	0000					
		3208	* MULTIDISC DATA TRANSFERS START HERE			MST32080
2946	C800 0201	3209		LHI R0,X'201'		MST32090
294A	4000 1900	3210		STH R0,WCHD		MST32100
294E	C800 0100	3211		LHI R0,X'100'	***MODIFY FOR LONGER DELAY*****	MST32110
2952	4000 1950	3212		STH R0,COUNTER		MST32120
2956	4850 1954	3213	MDATA	LH FUT,SECFILAD		MST32130
295A	4050 1930	3214		STH FUT,STATE	'STATE' = SECONDARY DRIVE	MST32140
295E	4190 3612	3215		BAL WK3,TSECT	GET LOCYL,HEAD	MST32150
2962	4850 1952	3216		LH FUT,FUTACRS	CRIVE ACRS	MST32160
2966	4050 1930	3217		STH FUT,STATE	'STATE' = PRIMARY CRIVE	MST32170
296A	4190 3612	3218		BAL WK3,TSECT	GET HEAD, SECTOR, CYLINDER	MST32180
296E	0800	3219		LDAR R0,SECT		MST32190
2970	4A00 180C	3220		AH R0,SECNUM+6		MST32200
2974	C800 0040	3221		SHI R0,MAXSEC		MST32210
2978	2328	3222		BNPS MDDAT.1		MST32220
297A	4810 194A	3223		LH R1,HEAD		MST32230
297E	2611	3224		AIS R1,1		MST32240
2980	4510 1920	3225		CLH R1,MAXHEAD	WILL CAUSE CYL OVERFLOW ?	MST32250

## SYSTEM TEST SEQUENCES - TEST 0C

2984	4380	108A	3226	BNL	ERRORS	BRANCH: YES. INV. SECTOR OPTION	MST32260
2988	41F0	3574	3227	MDDAT.1 BAL	R15,XFERSIZL	GET 'SIZE'	MST32270
298C	41F0	322A	3228	BAL	R15,RANDFILL	FILL BUFFER WITH RANDCM DATA	MST32280
2990	4810	196C	3229	LDA	R1,WTFADR		MST32290
2994	4051	0000	3230	STH	FUT,0(R1)	INSERT DRIVE IDENTIFIER	MST32300
2998	41F0	32EC	3231	BAL	RETN,WRIT	TO DRIVE	MST32310
299C	41F0	32CA	3232	BAL	RETN,READ	READ	MST32320
29A0	41F0	3274	3233	BAL	RETN,TDATA		MST32330
29A4	4850	1954	3234	LH	FUT,SECFILAC		MST32340
29A8	4050	1930	3235	STH	FUT,STATE	'STATE' = SECCNDARY DRIVE	MST32350
29AC	4810	196C	3236	LDA	R1,WTFADR		MST32360
29B0	4051	0000	3237	STH	FUT,0(R1)	INSERT DRIVE IDENTIFIER	MST32370
29B4	41F0	32EC	3238	BAL	RETN,WRIT	TO XFILE	MST32380
29B8	41F0	32CA	3239	BAL	RETN,READ		MST32390
29BC	41F0	3274	3240	BAL	RETN,TDATA		MST32400
29C0	41F0	377E	3241	BAL	R15,CNTDOWN	CONTINUE, OR EXIT.	MST32410
29C4	2956		3242	DAC	MDDATA	CONTINUATION VECTOR	MST32420

## SYSTEM TEST SEQUENCES - TEST 0D

```

3244 * *****
3245 *
3246 *           T E S T   D
3247 *
3248 * PURPOSE OF TEST:
3249 * TEST D CHECKS NORMAL-MODE READ/WRITE OPERATIONS WITH A WORST-CASE
3250 * DATA PATTERN SELECTED BY THE USER. ONE OR TWO SECTORS, SPECIFIED BY
3251 * THE SECTOR, LOCYL, AND BUFSIZ OPTIONS, ARE TESTED.
3252 *
3253 * ASSUMPTIONS:
3254 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3255 * ALTERNATE CHANNEL. THE DISC PACK USEC MUST BE PROPERLY FORMATTED.
3256 * 64 ADDRESS MARKS PER TRACK ARE ASSUMED.
3257 *
3258 * DESIGN SPECIFICATIONS:
3259 * THE DATA BUFFER IS FILLED WITH WORST-CASE DATA, SPECIFIED BY THE
3260 * 'DATA' OPTION. THE DATA IS WRITTEN TO THE SPECIFIED SECTOR(S),
3261 * READ BACK, AND/OR TESTED, ACCORDING TO THE SCOPE OPTION SELECTED.
3262 * THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY
3263 * IS DEPRESSED.
3264 *
3265 * HOW TO RUN THE TEST:
3266 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3267 * SECTOR, BUFSIZ, AND SCOPE OPTIONS, AND ENTER 'RUN'.
3268 * NO MANUAL INTERVENTION IS NECESSARY.
3269 *
3270 * OPTIONS:
3271 * LOOP, CCNTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
3272 * BUFSIZ, SCOPE, BYCKAD, INBUF, OUTBUF
3273 *
3274 * ERRORS:
3275 * 000000 - 0DFFFF
3276 *
29C6 41F0 1FC8 3277 TESTD BAL RETN,MODINIT
29CA 0082 3278 DCX 0082 NO ABORT; TSECT.
29CC C800 0201 3279 LHI R0,X'0201' NCRMAL MODE COMMANDS
29D0 4000 1900 3280 STH R0,WCMD
29D4 C800 00FF 3281 LHI R0,LRECL-1 SET SIZE TO 256
29D8 4880 1800 3282 LH WK2,BUFSIZ+6 CHECK SIZE OPTION
29DC 2333 3283 BZS TSTD.1
29DE C800 01FF 3284 LHI R0,2*LRECL-1 OPTION = 1
29E2 4000 1964 3285 TSTD.1 STA R0,SIZE STORE THE # OF BYTES
29E6 41F0 3212 3286 BAL R15,WCASFILL FILL BUFFER WITH WORST-CASE DATA
MST32440
MST32450
MST32460
MST32470
MST32480
MST32490
MST32500
MST32510
MST32520
MST32530
MST32540
MST32550
MST32560
MST32570
MST32580
MST32590
MST32600
MST32610
MST32620
MST32630
MST32640
MST32650
MST32660
MST32670
MST32680
MST32690
MST32700
MST32710
MST32720
MST32730
MST32740
MST32750
MST32760
MST32770
MST32780
MST32790
MST32800
MST32810
MST32820
MST32830
MST32840
MST32850
MST32860

3288 *-----ACTUAL SCOPE LOOP STARTS HERE
29EA C800 29FA 3289 SCOP LDAI R0,SCOP2
29EE 4000 197E 3290 STA R0,RERN
29F2 C800 05DC 3291 LHI R0,1500
29F6 4000 1950 3292 STH R0,COUNTER
29FA 4800 17E8 3293 SCOP2 LH R0,SCOPE+6 1 = READ; 2 = WRITE
3294 * 0 = WRITE/READ; 3 = WRITE/READ/TEST
MST32880
MST32890
MST32900
MST32910
MST32920
MST32930
MST32940

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## SYSTEM TEST SEQUENCES - TEST 0D

29FE	233E	3295	BZS	SCOP3		MST32950
2A00	2702	3296	SIS	RO,2	M	MST32960
2A02	211E	3297	BMS	SCOP4	BRANCH: SCOPE = 1	MST32970
2A04	2338	3298	EZS	SCOP6	BRANCH: SCOPE = 2	MST32980
2A06	41F0 32EC	3299	BAL	RETN,WRIT	SCOPE=3	MST32990
2A0A	41F0 32CA	3300	BAL	RETN,READ		MST33000
2A0E	41F0 3274	3301	BAL	RETN,TDATA		MST33010
2A12	2308	3302	BS	SCOP5		MST33020
2A14	41F0 32EC	3303	SCOP6	BAL	RETN,WRIT	MST33030
2A18	2305	3304	BS	SCOP5		MST33040
2A1A	41F0 32EC	3305	SCOP3	BAL	RETN,WRIT	MST33050
2A1E	41F0 32CA	3306	SCOP4	BAL	RETN,READ	MST33060
2A22	41F0 377E	3307	SCOP5	BAL	R15,CNTDOWN	MST33070
2A26	29FA	3308	DAC	SCOP2	WRITE	MST33080
					READ	
					CONTINUE, OR EXIT.	
					CONTINUATION VECTOR	

## SYSTEM TEST SEQUENCES - TEST 0E

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3310 * *****
3311 *
3312 *           T E S T   E
3313 *
3314 * PURPOSE OF TEST:
3315 * TEST E CHECKS FORMAT-MODE READ/WRITE OPERATIONS WITH A WORST-CASE
3316 * DATA PATTERN SELECTED BY THE USER. ONE OR TWO SECTORS, SPECIFIED BY
3317 * THE SECTOR, LOCYL, AND BUFSIZ OPTIONS, ARE TESTED.
3318 *
3319 * ASSUMPTIONS:
3320 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3321 * ALTERNATE CHANNEL. IF SCOPE = 1, THE DISC PACK USED MUST BE
3322 * PROPERLY FORMATTED. THE CONTROLLER MUST BE IN THE FORMAT MODE.
3323 *
3324 * DESIGN SPECIFICATIONS:
3325 * THE DATA BUFFER IS FILLED WITH CORRECT HEADER AND GAP INFORMATION,
3326 * AND WORST-CASE DATA, SPECIFIED BY THE 'DATA' OPTION. THE DEF SEC
3327 * AND WRT PROT BITS ARE RESET. THE DATA IS WRITTEN TO THE SPECIFIED
3328 * SECTOR(S), READ BACK, AND/OR TESTED, ACCORDING TO THE SCOPE OPTION
3329 * SELECTED.
3330 * THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY
3331 * IS DEPRESSED.
3332 *
3333 * HOW TO RUN THE TEST:
3334 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3335 * SECTOR, BUFSIZ, AND SCOPE OPTIONS, AND ENTER 'RUN'.
3336 * NO MANUAL INTERVENTION IS NECESSARY.
3337 *
3338 * OPTIONS:
3339 *
3340 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
3341 * BUFSIZ, SCOPE, INBUF, OUTBUF
3342 *
3343 * ERRORS:
3344 * 0E0000 - 0EFFFF
3345 *
2A28 41F0 1FC8 3346 TESTE  BAL  RETN,MODINIT
2A2C 0083 3347          DCX  0083          EVALUATE; NO ABORT; TSECT
2A2E C800 0113 3348          LHI  R0,PRECL-1      1 SECTOR SIZE
2A32 4810 1800 3349          LH   R1,BUFSIZ+6
2A36 2333 3350          BZS  TSTE.1
2A3E C800 0227 3351          LHI  R0,2*PRECL-1    2 SECTOR SIZE
2A3C 4000 1964 3352 TSTE.1  STA  R0,SIZE          SET TRANSFER SIZE
2A40 2611 3353          AIS  R1,1
2A42 4860 17DC 3354          LH   WK0,DATA+6      GET DATA PATTERN
2A46 41F0 3138 3355          BAL  RETN,FMSUCFA    SET UP SECTOR BUFFER(S)
2A4A 41F0 34E6 3356          BAL  R15,HEADER      SET UP GOOD FORMAT HEADER
2A4E 4800 192A 3357          LH   R0,LRCC          M
2A52 4001 0112 3358          STH  R0,PRECL-2(R1)
2A56 4001 0226 3359          STH  R0,2*PRECL-2(R1)
2A5A D360 177C 3360          LB   WK0,SECTOR+6      GET STARTING HEAD
2A5E C80D 0001 3361          LHI  R0,1(SECT)        SET UP SECOND SECTOR
2A62 C500 0041 3362          CLHI R0,MAXSEC+1    (MAY USE SECTOR X*40*)
MST33100
MST33110
MST33120
MST33130
MST33140
MST33150
MST33160
MST33170
MST33180
MST33190
MST33200
MST33210
MST33220
MST33230
MST33240
MST33250
MST33260
MST33270
MST33280
MST33290
MST33300
MST33310
MST33320
MST33330
MST33340
MST33350
MST33360
MST33370
MST33380
MST33390
MST33400
MST33410
MST33420
MST33430
MST33440
MST33450
MST33460
MST33470
MST33480
MST33490
MST33500
MST33510
MST33520
MST33530
MST33540
MST33550
MST33560
MST33570
MST33580
MST33590
MST33600
MST33610
MST33620

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## SYSTEM TEST SEQUENCES - TEST 0E

2A66	2183	3363	BLS	TSTE.2	.	MST33630
2A68	2400	3364	LIS	RO,0	.	MST33640
2A6A	2661	3365	AIS	WK0,1	.	MST33650
2A6C	0876	3366	LDAR	WK1,WK0	.	MST33660
2A6E	917A	3367	SLHLS	WK1,10	.	MST33670
2A70	067B	3368	CAR	WK1,TRACK	.	MST33680
2A72	9078	3369	SRHLS	WK1,8	.	MST33690
2A74	C201 0114	3370	STB	RO,PRECL(R1)	.	MST33700
2A78	D271 0115	3371	STB	WK1,PRECL+1(R1)	.	MST33710
2A7C	D2B1 0116	3372	STB	TRACK,PRECL+2(R1)	.	MST33720
		3373	*			MST33730
2A80	C800 0605	3374	LHI	RO,X*0605'	FORMAT WRITE/READ CMDS	MST33740
2A84	4000 1900	3375	STH	RO,WCHD		MST33750
2A88	4300 29EA	3376	B	SCOP		MST33760



SYSTEM TEST SEQUENCES - TEST OF

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3378 * *****
3379 *
3380 *           T E S T   F
3381 *
3382 * PURPOSE OF TEST:
3383 * TEST F FORMATS A SINGLE SECTOR WITH THE DEF SEC BIT SET IN THE
3384 * SECTOR HEADER, THEN CHECKS NORMAL-MODE READ/WRITE OPERATIONS ON THE
3385 * SAME SECTOR.
3386 *
3387 * ASSUMPTIONS:
3388 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3389 * ALTERNATE CHANNEL. SCOPE = 1 OR SCOPE = 3 ARE INVALID OPTIONS.
3390 * THE CONTROLLER MUST BE IN THE FORMAT MODE.
3391 *
3392 * DESIGN SPECIFICATIONS:
3393 * THE DATA BUFFER IS FILLED WITH CORRECT HEADER AND GAP INFORMATION,
3394 * AND WORST-CASE DATA SPECIFIED BY THE 'DATA' OPTION. THE DEF SEC BIT
3395 * IS SET, AND THE WRT PROT BIT IS RESET. THE DATA IS WRITTEN TO THE
3396 * SPECIFIED SECTOR IN THE FORMAT MODE, THEN ATTEMPTS ARE MADE TO WRITE
3397 * AND/OR READ THE SECTOR IN NORMAL MODE, ACCORDING TO THE SCOPE OPTION
3398 * ENTERED. DEF SEC STATUS IS EXPECTED FOR ALL NORMAL-MODE DATA
3399 * TRANSFER ATTEMPTS.
3400 * THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY
3401 * IS DEPRESSED.
3402 *
3403 * HOW TO RUN THE TEST:
3404 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3405 * SECTOR, AND SCOPE OPTIONS, AND ENTER 'RUN'.
3406 * NO MANUAL INTERVENTION IS REQUIRED.
3407 *
3408 * OPTIONS:
3409 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
3410 * SCOPE, INBUF, OUTBUF
3411 *
3412 * ERRORS:
3413 * 0F0000 - 0FFFFF
3414 *
2A8C 41F0 1FC8 3415 TESTF  BAL  RETN,MODINIT
2A90 0093 3416  DCX  0093
3417 *
3418  LDAI  R0,PBLK08
2A92 C800 3D8E 3419  STA  R0,RXERFL
2A9E 4000 1980 3420  LH  WK0,DATA+6
2A9A 4860 17DC 3421  BAL  RETN,FMSUDF
2A9E 41F0 3136 3422  BAL  R15,HEADER
2AA2 41F0 34E6 3423  LH  R0,LRCC
2AAE 4800 192A 3424  STH  R0,PRECL-2(R1)
2AAA 4001 0112 3425  LHI  WK1,X*80*(SECT)
2AAE C87D 0080 3426  STB  WK1,0(R1)
2AB2 D271 0000
3428 *----- COMMON PROCESS STARTS HERE
3429 *
MST33780
MST33790
MST33800
MST33810
MST33820
MST33830
MST33840
MST33850
MST33860
MST33870
MST33880
MST33890
MST33900
MST33910
MST33920
MST33930
MST33940
MST33950
MST33960
MST33970
MST33980
MST33990
MST34000
MST34010
MST34020
MST34030
MST34040
MST34050
MST34060
MST34070
MST34080
MST34090
MST34100
MST34110
MST34120
MST34130
MST34140
MST34150
MST34160
MST34170
MST34180
MST34190
MST34200
MST34210
MST34220
MST34230
MST34240
MST34250
MST34260
MST34280
MST34290

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## SYSTEM TEST SEQUENCES - TEST OF

2AB6	C800	2B12	3430	SCOPX	LDAI	RO,SCOP5X		MST34300
2ABA	4000	197E	3431		STA	RO,RERN	RERUN ADRS	MST34310
2ABE	C800	05DC	3432		LHI	RO,1500	LOOP COUNT	MST34320
2AC2	4000	1950	3433		STH	RO,COUNTER		MST34330
2AC6	C800	0601	3434	SCOPXA	LHI	RO,X*0601*	FORMAT WRITE/NORMAL READ	MST34340
2ACA	4000	1900	3435		STH	RO,WCMD		MST34350
2ACE	C800	0113	3436		LHI	RO,PRECL-1	TRANSFER LENGTH	MST34360
2AD2	4000	1964	3437		STA	RO,SIZE		MST34370
2AD6	41F0	32EC	3438		BAL	RETN,WRIT	WRITE FAULTY SECTOR	MST34380
			3439	*				MST34390
2ADA	C8C0	0090	3440		LHI	OPKEY,X*90*		MST34400
2ADE	40C0	1936	3441		STH	OPKEY,OPCODE	=TESTING CTRLR ERROR STATUS	MST34410
2AE2	C800	0201	3442		LHI	RO,X*0201*	NCRMAL READ/WRITE	MST34420
2AE6	4000	1900	3443		STH	RO,WCMD		MST34430
2AEA	C800	00FF	3444		LHI	RO,LRECL-1	TRANSFER SIZE	MST34440
2AEE	4000	1964	3445		STA	RO,SIZE		MST34450
2AF2	4800	1980	3446		LDA	RO,RXERFL		MST34460
2AF6	4000	1982	3447		STA	RO,ERRFLG	ERROR CHECK PBLKXX ADRS	MST34470
2AFA	4800	167A	3448		LH	RO,BTESTNO		MST34480
2AFE	C500	0010	3449		CLHI	RO,X*10*	TEST 10 ?	MST34490
2B02	2336		3450		BES	SCOP3X	YES- BYPASS WRITE	MST34500
2B04	41F0	32FC	3451		BAL	RETN,WRITX	ATTEMPT NORMAL WRITE	MST34510
2B08	4800	17E8	3452		LH	RO,SCOPE+6		MST34520
2B0C	2133		3453		BNZS	SCOP5X		MST34530
2B0E	41F0	32DA	3454	SCOP3X	BAL	RETN,READX	ATTEMPT NCRMAL READ	MST34540
2B12	41F0	377E	3455	SCOP5X	BAL	R15,CNTDOWN	CONTINUE, CR EXIT	MST34550
2B16	2AC6		3456		DAC	SCOPXA	CONTINUATION VECTOR	MST34560

## SYSTEM TEST SEQUENCES - TEST 10

		3458	*	*****		MST34580
		3459	*			MST34590
		3460	*	TEST 10		MST34600
		3461	*			MST34610
		3462	*	PURPOSE OF TEST:		MST34620
		3463	*	TEST 10 FORMATS A SINGLE SECTOR WITH AN INCORRECT NORMAL-MODE LRCC		MST34630
		3464	*	CHECKWORD, THEN CHECKS NORMAL-MODE READ OPERATIONS ON THE		MST34640
		3465	*	SAME SECTOR.		MST34650
		3466	*			MST34660
		3467	*	ASSUMPTIONS:		MST34670
		3468	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE		MST34680
		3469	*	CHANNEL. SCOPE = 1 OR SCOPE = 3 ARE INVALID OPTIONS. THE CONTROLLER		MST34690
		3470	*	MUST BE IN THE FORMAT MODE.		MST34700
		3471	*			MST34710
		3472	*	DESIGN SPECIFICATIONS:		MST34720
		3473	*	THE DATA BUFFER IS FILLED WITH CORRECT HEADER AND GAP INFORMATION,		MST34730
		3474	*	AND WORST-CASE DATA SPECIFIED BY THE 'DATA' OPTION. THE NORMAL-MODE		MST34740
		3475	*	LRCC CHECKWORD IS FORCED INCORRECT. THE DATA IS WRITTEN TO THE		MST34750
		3476	*	SPECIFIED SECTOR IN THE FORMAT MODE, THEN ATTEMPTS ARE MADE TO WRITE		MST34760
		3477	*	AND/OR READ THE SECTOR IN NORMAL MODE, ACCORDING TO THE SCOPE		MST34770
		3478	*	OPTION ENTERED. DATA TRANSFER ERROR IS EXPECTED FOR ALL NORMAL-MODE		MST34780
		3479	*	READ ATTEMPTS.		MST34790
		3480	*	THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BRK KEY IS		MST34800
		3481	*	DEPRESSED.		MST34810
		3482	*			MST34820
		3483	*	HOW TO RUN THE TEST:		MST34830
		3484	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,		MST34840
		3485	*	SECTOR, AND SCOPE OPTIONS, AND ENTER 'RUN'.		MST34850
		3486	*	NO MANUAL INTERVENTION IS REQUIRED.		MST34860
		3487	*			MST34870
		3488	*	OPTIONS:		MST34880
		3489	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTCR,		MST34890
		3490	*	SCOPE, INBUF, OUTBUF		MST34900
		3491	*			MST34910
		3492	*	ERRORS:		MST34920
		3493	*	100000 - 10FFFF		MST34930
		3494	*			MST34940
2B18	41F0 1FC8	3495	TEST10	BAL	RETN,MODINIT	MST34950
2B1C	0093	3496		DCX	0093	MST34960
		3497	*		NO ABORT; EVALUATE; SCOPE 1,3 INVALID; TSECT. TC TEST CTRLR STATUS = X'03'	MST34970
2B1E	C800 3D92	3498		LDAI	RO,PBLK09	MST34980
2B22	4000 1980	3499		STA	RO,RXERFL	MST34990
2B26	4860 17DC	3500		LH	WK0,DATA+6	MST35000
2B2A	41F0 3136	3501		BAL	RETN,FMSUCF	MST35010
2B2E	41F0 34E6	3502		BAL	R15,HEADER	MST35020
2B32	4800 192A	3503		LH	RO,LRCC	MST35030
2B36	C700 F0F0	3504		XHI	RO,X'F0F0'	MST35040
2B3A	4001 0112	3505		STH	RO,PRECL-2(R1)	MST35050
2B3E	4300 2AB6	3506		B	SCOPX	MST35060
					ESTABLISH GOOD HEADER FIELD	
					FORCE BAD LRCC	

## SYSTEM TEST SEQUENCES - TEST 11

		3508	*	*****		MST35080
		3509	*			MST35090
		3510	*	TEST 11		MST35100
		3511	*			MST35110
		3512	*	PURPOSE OF TEST:		MST35120
		3513	*	TEST 11 FORMATS A SINGLE SECTOR WITH AN INCORRECT CYLINDER ADDRESS		MST35130
		3514	*	IN THE SECTOR HEADER, THEN CHECKS NORMAL-MODE READ/WRITE OPERATIONS		MST35140
		3515	*	ON THE SAME SECTOR.		MST35150
		3516	*			MST35160
		3517	*	ASSUMPTIONS:		MST35170
		3518	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE		MST35180
		3519	*	ALTERNATE CHANNEL. SCOPE = 1 OR SCOPE = 3 ARE INVALID OPTIONS.		MST35190
		3520	*	THE CONTROLLER MUST BE IN THE FORMAT MODE.		MST35200
		3521	*			MST35210
		3522	*	DESIGN SPECIFICATIONS:		MST35220
		3523	*	THE DATA BUFFER IS FILLED WITH CORRECT HEADER AND GAP INFORMATION,		MST35230
		3524	*	AND WORST-CASE DATA SPECIFIED BY THE 'DATA' OPTION. THE CYLINDER		MST35240
		3525	*	ADDRESS DATA IS FORCED INCORRECT, AND THE DATA IS WRITTEN TO THE		MST35250
		3526	*	SPECIFIED SECTOR IN THE FORMAT MODE. ATTEMPTS ARE THEN MADE TO		MST35260
		3527	*	WRITE AND/OR READ THE SECTOR IN NORMAL MODE, ACCORDING TO THE SCOPE		MST35270
		3528	*	OPTION ENTERED. HEADER COMPARE FAILURE IS EXPECTED FOR ALL NORMAL-		MST35280
		3529	*	MODE DATA TRANSFER ATTEMPTS.		MST35290
		3530	*	THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY		MST35300
		3531	*	IS DEPRESSED.		MST35310
		3532	*			MST35320
		3533	*	HOW TO RUN THE TEST:		MST35330
		3534	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,		MST35340
		3535	*	SECTOR, AND SCOPE OPTIONS, AND ENTER 'RUN'.		MST35350
		3536	*	NO MANUAL INTERVENTION IS REQUIRED.		MST35360
		3537	*			MST35370
		3538	*	OPTIONS:		MST35380
		3539	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,		MST35390
		3540	*	SCOPE, INBUF, OUTBUF		MST35400
		3541	*			MST35410
		3542	*	ERRORS:		MST35420
		3543	*	110000 - 11FFFF		MST35430
		3544	*			MST35440
2842	41F0 1FC8	3545	TEST11	BAL	RETN,MODINIT	MST35450
2846	0093	3546		DCX	0093	MST35460
		3547	*			MST35470
2848	C800 3D96	3548		LDAI	RO,PBLK0A	MST35480
284C	4000 1980	3549		STA	RO,RXERFL	MST35490
2850	4860 17DC	3550		LH	WKO,DATA+6	MST35500
2854	41F0 3136	3551		BAL	RETN,FMSUDF	MST35510
2858	4880 191E	3552		LH	TRACK,MAXCYL	MST35520
285C	41F0 34E6	3553		BAL	R15,HEADER	MST35530
2860	4800 192A	3554		LH	RO,LRCC	MST35540
2864	4001 0112	3555		STH	RO,PRECL-2(R1)	MST35550
2868	4880 1758	3556		LH	TRACK,LOCYL+6	MST35560
286C	4300 2AB6	3557		B	SCOPX	MST35570

NO ABORT; EVALUATE;  
SCOPE 1,3 INVALID; TSECT.  
TO TEST CTRLR STATUS = X\*4E\*

SET BAD TRACK IN HEADER  
COMPUTED LRCC

SYSTEM TEST SEQUENCES - TEST 12

		3559	*	*****				MST35590
		3560	*					MST35600
		3561	*	TEST 12				MST35610
		3562	*					MST35620
		3563	*	PURPOSE OF TEST:				MST35630
		3564	*	TEST 12 FORMATS A SINGLE SECTOR WITH AN INCORRECT HEAD ADDRESS				MST35640
		3565	*	IN THE SECTOR HEADER, THEN CHECKS NORMAL-MODE READ/WRITE OPERATIONS				MST35650
		3566	*	ON THE SAME SECTOR. 64 ADDRESS MARKS PER TRACK ARE ASSUMED.				MST35660
		3567	*					MST35670
		3568	*	ASSUMPTIONS:				MST35680
		3569	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE				MST35690
		3570	*	ALTERNATE CHANNEL. SCOPE = 1 OR SCOPE = 3 ARE INVALID OPTIONS.				MST35700
		3571	*	THE CONTROLLER MUST BE IN THE FORMAT MODE.				MST35710
		3572	*					MST35720
		3573	*	DESIGN SPECIFICATIONS:				MST35730
		3574	*	THE DATA BUFFER IS FILLED WITH CORRECT HEADER AND GAP INFORMATION,				MST35740
		3575	*	AND WORST-CASE DATA SPECIFIED BY THE 'DATA' OPTION. THE HEAD ADDRESS				MST35750
		3576	*	DATA IS FORCED INCORRECT, AND THE DATA IS WRITTEN TO THE SPECIFIED				MST35760
		3577	*	SECTOR IN THE FORMAT MODE. ATTEMPTS ARE THEN MADE TO WRITE AND/OR				MST35770
		3578	*	READ THE SECTOR IN NORMAL MODE, ACCORDING TO THE SCOPE OPTION				MST35780
		3579	*	ENTERED. HEADER COMPARE FAILURE IS EXPECTED FOR ALL NORMAL-MODE				MST35790
		3580	*	DATA TRANSFER ATTEMPTS.				MST35800
		3581	*	THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY				MST35810
		3582	*	IS DEPRESSED.				MST35820
		3583	*					MST35830
		3584	*	HOW TO RUN THE TEST:				MST35840
		3585	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,				MST35850
		3586	*	SECTOR, AND SCOPE OPTIONS, AND ENTER 'RUN'.				MST35860
		3587	*	NO MANUAL INTERVENTION IS REQUIRED.				MST35870
		3588	*					MST35880
		3589	*	OPTIONS:				MST35890
		3590	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,				MST35900
		3591	*	SCOPE, INBUF, OUTBUF				MST35910
		3592	*					MST35920
		3593	*	ERRORS:				MST35930
		3594	*	120000 - 12FFFF				MST35940
		3595	*					MST35950
2870	41F0 1FC8	3596	TEST12	BAL	RETN,MODINIT			MST35960
2874	0093	3597		DCX	0093			MST35970
		3598	*			NO ABORT; EVALUATE;		MST35980
		3599		LDAL	RO,PBLKOA	SCOPE 1,3 INVALID; TSECT.		MST35990
2876	C800 3D96	3600		STA	RO,RXERFL	TC TEST CTRLR STATUS = X'4E'		MST36000
287A	4000 1980	3601		LH	WKO,DATA+6			MST36010
287E	4860 17DC	3602		BAL	RETN,FMSUCF			MST36020
2882	41F0 3136	3603		LH	RO,MAXHEAD			MST36030
2886	4800 1920	3604		STH	RO,HEAD			MST36040
288A	4000 194A	3605		BAL	R15,HEADER	SET WRONG HEAD ADRS IN HEADER		MST36050
288E	41F0 34E6	3606		LH	RO,LRCC	COMPUTED CKSLM		MST36060
2892	4800 192A	3607		STH	RO,PRECL-2(R1)			MST36070
2896	4001 0112	3608		LB	RO,SECTOR+E			MST36080
289A	0300 1770	3609		STH	RO,HEAD	CORRECT HEAD		MST36090
289E	4000 194A	3610		B	SCOPX			MST36100
28A2	4300 2AB6							

## SYSTEM TEST SEQUENCES - TEST 13

		3612	*	*****			MST36120
		3613	*				MST36130
		3614	*	TEST 13			MST36140
		3615	*				MST36150
		3616	*	PURPOSE OF TEST:			MST36160
		3617	*	TEST 13 PERFORMS A READ CHECK OF ANY SELECTED SECTOR.			MST36170
		3618	*				MST36180
		3619	*	ASSUMPTIONS:			MST36190
		3620	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE			MST36200
		3621	*	ALTERNATE CHANNEL. THE SELECTED SECTOR MUST BE PROPERLY FORMATTED			MST36210
		3622	*	TO PERFORM THE READ-CHECK OPERATION SUCCESSFULLY.			MST36220
		3623	*				MST36230
		3624	*	DESIGN SPECIFICATIONS:			MST36240
		3625	*	THE SECTOR SPECIFIED BY THE LOCYL AND SECTOR OPTIONS IS USED TO			MST36250
		3626	*	PERFORM A READ-CHECK OPERATION. ALL VALID SECTOR AND CYLINDER			MST36260
		3627	*	ADDRESSES REFERENCED BY THE PACTYP OPTION ARE ALLOWED. NO CHECK			MST36270
		3628	*	IS MADE FOR INVALID CYLINDER ADDRESSES ON CE PACKS.			MST36280
		3629	*	THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY			MST36290
		3630	*	IS DEPRESSED.			MST36300
		3631	*				MST36310
		3632	*	HOW TO RUN THE TEST:			MST36320
		3633	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,			MST36330
		3634	*	AND SECTOR OPTIONS, AND ENTER 'RUN'.			MST36340
		3635	*	NO MANUAL INTERVENTION IS REQUIRED.			MST36350
		3636	*				MST36360
		3637	*	OPTIONS:			MST36370
		3638	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR			MST36380
		3639	*				MST36390
		3640	*	ERRORS:			MST36400
		3641	*	130000 - 13FFFF			MST36410
		3642	*				MST36420
		3643	TEST13	BAL	RETN,MODINIT		MST36430
		3644		DCX	0082	NO ABORT; TSECT.	MST36440
		3645		LDAI	R0,TST13.1		MST36450
		3646		STA	R0,RERN		MST36460
		3647		LHI	R0,1500		MST36470
		3648		STH	R0,COUNTER		MST36480
		3649	TST13.0	BAL	RETN,CKADSRX	DO READ-CHECK	MST36490
		3650	TST13.1	BAL	R15,CNTDOWN	CONTINUE, OR EXIT	MST36500
		3651		DAC	TST13.0	CONTINUATION VECTOR	MST36510
2BA6	41F0	1FC8					
2BAA	0082						
2BAC	C800	2BC0					
2BB0	4000	197E					
2BB4	C800	05DC					
2BB8	4000	1950					
2BBC	41F0	369E					
2BC0	41F0	377E					
2BC4	2BBC						

## SYSTEM TEST SEQUENCES - TEST 14

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3653 * *****
3654 *
3655 *           T E S T   1 4
3656 *
3657 * PURPOSE OF TEST:
3658 * TEST 14 PERFORMS A CHECK OF THE SEEK/RESTORE OPERATION BY
3659 * SEEKING TO A SELECTED CYLINDER AFTER A RESTORE, OR BY SEEKING
3660 * BETWEEN SELECTED CYLINDERS.
3661 *
3662 * ASSUMPTIONS:
3663 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3664 * ALTERNATE CHANNEL. THE DISC PACK MUST BE PROPERLY FORMATTED IF
3665 * BYCKAD = 0. 64 ADDRESS MARKS PER TRACK ARE ASSUMED.
3666 *
3667 * DESIGN SPECIFICATIONS:
3668 * A SEEK IS MADE TO LOCYL. IF SEEK = 1, A SEEK IS THEN MADE TO HICYL;
3669 * ELSE, IF SEEK = 0, THE HEADS ARE RESTORED. A READ-CHECK IS
3670 * MADE ON THE HEAD AND SECTOR SPECIFIED BY THE 'SECTOR' OPTION
3671 * FOLLOWING EACH SEEK OR RESTORE, UNLESS BYCKAD = 1.
3672 * THE TEST TERMINATES AFTER 512 ITERATIONS IF SEEK = 0 (2048
3673 * ITERATIONS IF SEEK = 1), OR WHEN THE BREAK KEY IS DEPRESSED.
3674 *
3675 * HOW TO RUN THE TEST:
3676 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3677 * HICYL, SECTOR, SEEK, AND BYCKAD OPTIONS, AND ENTER 'RUN'.
3678 * NO MANUAL INTERVENTION IS REQUIRED.
3679 *
3680 * OPTIONS:
3681 * LGOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, HICYL,
3682 * SECTOR, SEEK, BYCKAD
3683 *
3684 * ERRORS:
3685 * 140000 - 14FFFF
3686 *
3687 TEST14  BAL   RETN,MODINIT
3688          DCX   0000                NO SPECIAL FLAGS
3689          LDAI  R0,TST14.4
3690          STA   R0,RERN
3691          LHI   R1,2048                SET FOR 2048 ITERATIONS
3692          LH    R0,SEEK+6
3693          BNZS  TST14.0
3694          SRLS  R1,2                    (OR 512 ITERATIONS)
3695 TST14.0  SIH   R1,COUNTER
3696 TST14.1  BAL   WK3,TSECT              GET LOCYL, HEAD, SECTOR
3697          BAL   RETN,CKADSR
3698          LH    R0,SEEK+6
3699          BNZS  TST14.2                SEEK = 0 : DO RESTORE
3700          BAL   R15,RESTORE
3701          BS    TST14.3
3702 TST14.2  LH    TRACK,HICYL+6
3703          BAL   RETN,SKSR
3704 TST14.3  BAL   RETN,CKADSR
3705 TST14.4  BAL   R15,CNTDOWN           CONTINUE, OR EXIT
3706          BS    TST14.3
3707          BS    TST14.3
3708          BS    TST14.3
3709          BS    TST14.3
3710          BS    TST14.3
3711          BS    TST14.3
3712          BS    TST14.3
3713          BS    TST14.3
3714          BS    TST14.3
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3959          BS    TST14.3
3960          BS    TST14.3
3961          BS    TST14.3
3962          BS    TST14.3
3963          BS    TST14.3
3964          BS    TST14.3
3965          BS    TST14.3
3966          BS    TST14.3
3967          BS    TST14.3
3968          BS    TST14.3
3969          BS    TST14.3
3970          BS    TST14.3
3971          BS    TST14.3
3972          BS    TST14.3
3973          BS    TST14.3
3974          BS    TST14.3
3975          BS    TST14.3
3976          BS    TST14.3
3977          BS    TST14.3
3978          BS    TST14.3
3979          BS    TST14.3
3980          BS    TST14.3
3981          BS    TST14.3
3982          BS    TST14.3
3983          BS    TST14.3
3984          BS    TST14.3
3985          BS    TST14.3
3986          BS    TST14.3
3987          BS    TST14.3
3988          BS    TST14.3
3989          BS    TST14.3
3990          BS    TST14.3
3991          BS    TST14.3
3992          BS    TST14.3
3993          BS    TST14.3
3994          BS    TST14.3
3995          BS    TST14.3
3996          BS    TST14.3
3997          BS    TST14.3
3998          BS    TST14.3
3999          BS    TST14.3
4000          BS    TST14.3
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MSN DISC TEST 06-200F01M96R01A13 (16-BIT)

SYSTEM TEST SEQUENCES - TEST 14

2C08 2BE4

3706

DAC IST14.1

CONTINUATION VECTOR

MST37060



SYSTEM TEST SEQUENCES - TEST 15

```

3708 * *****
3709 *
3710 *           T E S T   1 5
3711 *
3712 * PURPOSE OF TEST:
3713 * TEST 15 PERFORMS A NORMAL-MODE READ OF ALL SECTORS FROM LOCYL TO
3714 * HICYL INCLUSIVELY, WITH NORMAL ERROR CHECKING.
3715 *
3716 * ASSUMPTIONS:
3717 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3718 * ALTERNATE CHANNEL. THE DISC PACK MUST BE PROPERLY FORMATTED.
3719 * 64 ADDRESS MARKS PER TRACK ARE ASSUMED. IF 'SECNUM' IS > X'3F',
3720 * NO HEADS MAY BE DELETED.
3721 *
3722 * DESIGN SPECIFICATIONS:
3723 * A SEEK IS MADE TO 'LOCYL', AND THE FIRST NON-DELETED HEAD IS
3724 * SELECTED. (SECNUM+1) SECTORS ARE READ, WITH NORMAL ERROR CHECKING.
3725 * ALL SECTORS ARE READ FOR CYLINDERS (LOCYL-HICYL), FOR ALL NON-
3726 * DELETED HEADS. DATA ON THE DISC IS NOT DESTROYED. AUTOMATIC RE-READ
3727 * IS NOT PERFORMED; NO DISTINCTION IS MADE BETWEEN 'SOFT' AND 'HARD'
3728 * READ ERRORS.
3729 *
3730 * IN THE CASE OF SECNUM > X'3F', THE FIRST TRANSFER BEGINS WITH HEAD 0,
3731 * SECTOR 0, AND CONTINUES THROUGH THE LAST SECTOR REQUIRED. IF CYLINDER
3732 * OVERFLOW IS EXPECTED, THAT STATUS IS TESTED FOR. EACH SUBSEQUENT READ
3733 * BEGINS ON SECTOR 0 OF THE FOLLOWING HEAD, UNTIL READS HAVE BEEN
3734 * INITIATED ON ALL HEADS.
3735 *
3736 * IT IS HELPFUL TO PLACE THE READ BUFFER BELOW THE WRITE BUFFER, IF
3737 * READING VERY LARGE BLOCKS OF DATA, WITH LIMITED MEMORY. THIS PREVENTS
3738 * THE REQUIREMENT FOR A LARGE WRITE BUFFER (USE THE LAST HALFWORD
3739 * OF MEMORY), AND THE 'INVALID CUTEUF OPTION' MESSAGE.
3740 *
3741 * HOW TO RUN THE TEST:
3742 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3743 * HICYL, SECNUM, AND BYCKAD OPTIONS, AND ENTER 'RUN'. NO MANUAL
3744 * INTERVENTION IS REQUIRED.
3745 *
3746 * OPTIONS:
3747 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL,
3748 * HICYL, SECNUM, INBUF, HEADS
3749 *
3750 * ERRORS:
3751 * 150000 - 15FFFF
3752 *
3753 TEST15  BAL  RETN,MODINIT
3754         DCX  0042           NO ABORT, SECNUM > X'3F'.
3755         LH  TRACK,LOCYL*6
3756         BAL  R15,XFERSIZL  GET 'SIZE'
3757         LHI  R0,X'0201'    M
3758         STH  R0,UCMO      M
3759 TST15.1 LDAI R0,TST15.4
3760         STA  R0,RERN      RERUN ADRS FOR SEEK ERRORS
MST37080
MST37090
MST37100
MST37110
MST37120
MST37130
MST37140
MST37150
MST37160
MST37170
MST37180
MST37190
MST37200
MST37210
MST37220
MST37230
MST37240
MST37250
MST37260
MST37270
MST37280
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MST37360
MST37370
MST37380
MST37390
MST37400
MST37410
MST37420
MST37430
MST37440
MST37450
MST37460
MST37470
MST37480
MST37490
MST37500
MST37510
MST37520
MST37530
MST37540
MST37550
MST37560
MST37570
MST37580
MST37590
MST37600

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2C0A 41F0 1FC8
2C0E 0042
2C10 48B0 1758
2C14 41F0 3574
2C18 C800 0201
2C1C 4000 1900
2C20 C800 2C96
2C24 4000 197E

```

## SYSTEM TEST SEQUENCES - TEST 15

2C28	41F0 33B4	3761	BAL	RETN,ILLADD		MST37610
2C2C	2C96	3762	DAC	TST15.4	BYPASS DESTINATION	MST37620
2C2E	41F0 35F0	3763	BAL	RETN,SKSR	SEEK TRACK	MST37630
2C32	41F0 3730	3764	BAL	R15,FIRSTHD	GET FIRST NON-DELETED HEAD	MST37640
2C36	2C3C	3765	DAC	TST15.1A	CONTINUATION VECTOR	MST37650
2C38	4300 1DCA	3766	B	ERROR16	INVALID 'HEADS' OPTION.	MST37660
2C3C	C800 2C8A	3767	TST15.1A	LDAI RO,TST15.3		MST37670
2C40	4000 197E	3768	STA	RO,RERN	RERUN ADRS FOR READ ERRORS	MST37680
2C44	24D0	3769	LIS	SECT,0		MST37690
2C46	C8C0 0070	3770	TST15.2	LHI OPKEY,X'70'		MST37700
2C4A	40C0 193E	3771	STH	OPKEY,OPCODE	=READ OPERATION	MST37710
2C4E	2501	3772	LCS	RO,1		MST37720
2C50	4000 1982	3773	STA	RO,ERRFLG	FORCE UNCONDITIONAL RETURN	MST37730
2C54	2400	3774	LIS	RO,0	ACCUMULATE SECTOR COUNT:	MST37740
2C5E	4810 194A	3775	LH	R1,HEAD	CURRENT HEAD	MST37750
2C5A	4510 1920	3776	TST15.2A	CLH R1,MAXHEAD	LAST HEAD ACCOUNTED FOR ?	MST37760
2C5E	2385	3777	BNLS	TST15.2B	BRANCH: YES.	MST37770
2C60	CA00 0040	3778	AHI	RO,MAXSEC	INCLUDE ANOTHER TRACK OF SECTORS	MST37780
2C64	2611	3779	AIS	R1,1	INCREMENT HEAD COUNT	MST37790
2C66	2206	3780	BS	TST15.2A		MST37800
2C68	0B0D	3781	TST15.2B	SAR RO,SECT	SUBTRACT SECTORS DONE, CURRENT TRACK	MST37810
2C6A	2701	3782	SIS	RO,1	ADJUST FOR SECNUM CONVENTION	MST37820
2C6C	C810 3DA6	3783	LDAI	R1,PBLKOE	TO TEST CTRLR STATUS = X'02'	MST37830
2C70	4500 180C	3784	CLH	RO,SECNUM+6	WILL CYL OVERFLOW OCCUR ?	MST37840
2C74	2383	3785	BNLS	TST15.2C	BRANCH: NO.	MST37850
2C76	C810 3D9E	3786	LDAI	R1,PBLKOC	TO TEST CTRLR STATUS = X'1E'	MST37860
2C7A	4010 1980	3787	TST15.2C	STA R1,RXERFL	SAVE PBLKNN ADDRESS;	MST37870
2C7E	41F0 32DA	3788	BAL	R15,READX	PERFORM READ	MST37880
2C82	4810 1980	3789	LDA	R1,RXERFL	RELOAD PBLKNN ADDRESS,	MST37890
2C86	E121 0000	3790	SVC	2,0(R1)	TEST RESULT OF REAC.	MST37900
2C8A	41F0 3712	3791	TST15.3	BAL R15,NEWSEC	GET NEXT SECTOR NUMBER	MST37910
2C8E	2C46	3792	DAC	TST15.2	CONTINUATION	MST37920
2C90	41F0 3728	3793	BAL	R15,NEWHEAD	GET NEXT HEAD	MST37930
2C94	2C3C	3794	DAC	TST15.1A	CONTINUATION	MST37940
2C96	41F0 3770	3795	TST15.4	BAL R15,NEWCYL	GET NEXT CYLINDER	MST37950
2C9A	2C20	3796	DAC	TST15.1	CONTINUATION	MST37960
2C9C	4300 0E32	3797	B	TSTEND	EXIT.	MST37970

SYSTEM TEST SEQUENCES - TEST 16

	3799	*	*****		MST37990
	3800	*			MST38000
	3801	*	TEST 16		MST38010
	3802	*			MST38020
	3803	*	PURPOSE OF TEST:		MST38030
	3804	*	TEST 16 READS AND WRITES SELECTED SECTORS IN THE OFFSET MODE.		MST38040
	3805	*			MST38050
	3806	*	ASSUMPTIONS:		MST38060
	3807	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE		MST38070
	3808	*	CHANNEL. THE SELECTED SECTOR(S) MUST BE PROPERLY FORMATTED.		MST38080
	3809	*	THE DRIVE MUST NOT BE WRITE-PROTECTED. 64 ADDRESS MARKS PER TRACK		MST38090
	3810	*	ARE ASSUMED.		MST38100
	3811	*			MST38110
	3812	*	DESIGN SPECIFICATIONS:		MST38120
	3813	*	WORST-CASE DATA SPECIFIED BY THE 'DATA' OPTION IS WRITTEN TO THE		MST38130
	3814	*	SECTORS SPECIFIED BY THE 'LOCYL', 'SECTOR', AND 'SECNUM' OPTIONS,		MST38140
	3815	*	ACCORDING TO THE 'SCOPE' OPTION. THE DATA IS THEN READ BACK, AND/OR		MST38150
	3816	*	TESTED, USING SERVO-STROBE OFFSETS ACCORDING TO THE 'OFFSET' AND		MST38160
	3817	*	'SCOPE' OPTIONS. WRITE-OFFSET IS NOT ATTEMPTED.		MST38170
	3818	*	THE FAULT LAMP ON THE DISC DRIVE SHOULD NOT LIGHT.		MST38180
	3819	*	THE TEST ABORTS AFTER 1500 ITERATIONS, OR WHEN THE 'BREAK' KEY		MST38190
	3820	*	IS DEPRESSED.		MST38200
	3821	*			MST38210
	3822	*	HOW TO RUN THE TEST:		MST38220
	3823	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,		MST38230
	3824	*	SECTOR, SCOPE, SECNUM, AND OFFSET OPTIONS, AND ENTER 'RUN'.		MST38240
	3825	*	NO MANUAL INTERVENTION IS REQUIRED.		MST38250
	3826	*			MST38260
	3827	*	OPTIONS:		MST38270
	3828	*	SELCH, DISCON, DRIVE, LOCYL, SECTOR, SECNUM, SCOPE, OFFSET		MST38280
	3829	*			MST38290
	3830	*	ERRORS:		MST38300
	3831	*	160000 - 16FFFF		MST38310
	3832	*			MST38320
2CA0	41F0 1FC8	3833	TEST16 BAL RETN,MODINIT		MST38330
2CA4	0082	3834	DCX 0082	NO ABORT; TSECT.	MST38340
2CA6	080D	3835	LDAR RO,SECT		MST38350
2CA8	4A00 180C	3836	AH		MST38360
2CAC	C500 0040	3837	CLHI RO,MAXSEC	WILL HEAD ADVANCE OCCUR ?	MST38370
2CB0	4380 1072	3838	BNL ERROR1	ERANCF: INVALID SECNUM OPTION	MST38380
2CB4	41F0 3574	3839	BAL R15,XFERSIZL	SET UP 'SIZE'	MST38390
2CB8	41F0 3212	3840	BAL R15,WCAFILL	FILL BUFFER WITH WORST-CASE DATA	MST38400
2CBC	C800 0201	3841	LHI RO,X'0201'		MST38410
2CC0	4000 1900	3842	STH RO,WCMD	NORMAL WRITE/READ COMMANDS	MST38420
2CC4	C800 2D14	3843	LDAI RO,TST16.6		MST38430
2CC8	4000 197E	3844	STA RO,RERN	RERUN ADDRESS	MST38440
2CCC	C800 050C	3845	LHI RO,1500		MST38450
2CD0	4000 1950	3846	STH RO,COUNTER		MST38460
		3847	*		MST38470
2CD4	4800 17E8	3848	TST16.1 LH RO,SCOPE+6		MST38480
2CD8	2701	3849	SIS RO,1	TEST SCOPE OPTION:	MST38490
2CDA	2335	3850	BZS TST16.3	BRANCH: SCOPE = 1 (READ ONLY)	MST38500
2CDC	4190 2D22	3851	BAL WK3,CLRNOM1	ESTABLISH NOMINAL OFFSETS	MST38510

## SYSTEM TEST SEQUENCES - TEST 16

2CE0	41F0 32EC	3852	BAL	R15,WRIT	WRITE DATA PATTERN, NOMINAL OFFSETS	MST38520
		3853	*			MST38530
2CE4	4800 17E8	3854	TST16.3	LH R0,SCOPE+6		MST38540
2CE8	2702	3855	SIS	R0,2		MST38550
2CEA	4330 2D08	3856	BZ	TST16.4	BRANCH: SCOPE = 2 (WRITE ONLY)	MST38560
2CEE	4190 2D1A	3857	BAL	WK3,CLRNM	CHECK FOR CLEAR/NOMINAL OFFSETS	MST38570
2CF2	C300 17F5	3858	LB	R0,OFFSET+7		MST38580
2CF6	D200 1904	3859	STB	R0,OFFCMD		MST38590
2CFA	9E50	3860	OCR	FUT,R0	RE-ESTABLISH SPEC'D OFFSETS	MST38600
2CFC	41F0 343C	3861	BAL	R15,FRSSR1	WAIT FOR ALL READY.	MST38610
2D00	41F0 32CA	3862	BAL	R15,READ	ATTEMPT NO-ERROR READ	MST38620
2D04	E130 3D7E	3863	SVC	3,PBLK04	TEST CRIVE STATUS = X'00'	MST38630
		3864	*			MST38640
2D08	4800 17E8	3865	TST16.4	LH R0,SCOPE+6		MST38650
2D0C	2703	3866	SIS	R0,3	SCOPE = 3 ?	MST38660
2D0E	2133	3867	BNZS	TST16.6	BRANCH: NO.	MST38670
2D10	41F0 3274	3868	BAL	R15,TDATA	TEST DATA READ.	MST38680
		3869	*			MST38690
2D14	41F0 377E	3870	TST16.6	BAL R15,CNTDOWN	LOOP, OR EXIT.	MST38700
2D18	2CD4	3871	DAC	TST16.1	CONTINUATION VECTOR.	MST38710
2D1A	4800 17F4	3873	CLRNM	LH R0,OFFSET+6		MST38730
2D1E	9008	3874	SRHLS	R0,8	TEST 'XX' PORTION	MST38740
2D20	0339	3875	BZR	WK3	BRANCH: NO CLEAR/NOMINALS	MST38750
2D22	24C0	3876	CLRNM1	LIS OPKEY,0		MST38760
2D24	40C0 1936	3877	STH	OPKEY,OPCODE	=TESTING INITIAL STATUS	MST38770
2D28	DE30 1908	3878	OC	DCAD,RESET		MST38780
2D2C	DE50 1907	3879	OC	FUT,CLEAR		MST38790
2D30	41F0 343C	3880	BAL	R15,FRSSR1	WAIT FOR ALL READY	MST38800
2D34	C800 0030	3881	LHI	R0,X'30'		MST38810
2D38	D200 1904	3882	STB	R0,OFFCMD		MST38820
2D3C	9E50	3883	OCR	FUT,R0	NOMINAL OFFSETS:	MST38830
2D3E	41F0 35F0	3884	BAL	R15,SKSR	RE-SEEK NOMINAL.	MST38840
2D42	C309	3885	BR	WK3	RETURN.	MST38850

SYSTEM TEST SEQUENCES - TEST 17

	3887	*	*****		MST38870
	3888	*			MST38880
	3889	*	TEST 17		MST38890
	3890	*			MST38900
	3891	*	PURPOSE OF TEST:		MST38910
	3892	*	TEST 17 PERFORMS A SIMPLE GO/NO GO FORMATTING OPERATION ON THE		MST38920
	3893	*	TRACK SPECIFIED BY THE 'LOCYL' AND 'SECTOR' OPTIONS. TEST 17 MUST		MST38930
	3894	*	MUST BE RUN WHENEVER A TEST WRITING IN FORMAT PCDE HAS BEEN RUN,		MST38940
	3895	*	TO PRESERVE THE ADDRESS-MARK SECTORING.		MST38950
	3896	*			MST38960
	3897	*	ASSUMPTIONS:		MST38970
	3898	*	THE SELECTED DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO		MST38980
	3899	*	THE ALTERNATE CHANNEL. THE CONTROLLER MUST BE IN THE FORMAT MODE.		MST38990
	3900	*	THE DRIVE MUST NOT BE WRITE-PROTECTED.		MST39000
	3901	*			MST39010
	3902	*	DESIGN SPECIFICATIONS:		MST39020
	3903	*	THE HEADS ARE SEEKED TO 'LOCYL'; THE HEAD SPECIFIED BY THE 'SECTOR'		MST39030
	3904	*	OPTION IS SELECTED. PROPER FORMAT IS WRITTEN ON EACH SECTOR, 0-X'3F',		MST39040
	3905	*	AND THE SECTOR IS READ-CHECKED. A FORMAT READ IS PERFORMED,		MST39050
	3906	*	AND THE DATA READ IS TESTED. ANY ERROR CAUSES A SECTOR TO BE FLAGGED		MST39060
	3907	*	AS DEFECTIVE; THE FLAG IS TESTED. FINALLY, THE ADDRESS MARK ON SECTOR		MST39070
	3908	*	X'40' IS ERASED, AND THE SECTOR IS READ, EXPECTING HEADER COMPARE		MST39080
	3909	*	FAILURE (TESTED IN SOFTWARE AFTER FORMAT READ). THE TEST TERMINATES.		MST39090
	3910	*	THE TEST THEN TERMINATES.		MST39100
	3911	*			MST39110
	3912	*	HOW TO RUN THE TEST:		MST39120
	3913	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, AND		MST39130
	3914	*	LOCYL OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.		MST39140
	3915	*			MST39150
	3916	*	OPTIONS:		MST39160
	3917	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL,		MST39170
	3918	*	INBUF, OUTBUF, SECTOR (HEAD PCRTICK)		MST39180
	3919	*			MST39190
	3920	*	ERRORS:		MST39200
	3921	*	170000 - 17FFFF		MST39210
	3922	*			MST39220
2D44	E150 18E0	3923	REFORMAT SVC 5,MSG32	'ATTEMPTING RE-FORMAT'	MST39230
2D48	41F0 1FC8	3924	TEST17 BAL RETN,MODINIT		MST39240
2D4C	8084	3925	DCX 8084	REFORMAT IN PROGRESS; TSECT;	MST39250
		3926	*	65 SECTORS.	MST39260
2D4E	4860 17DC	3927	LH WKO,DATA+6		MST39270
2D52	41F0 3136	3928	BAL RETN,FMSUCF	SET UP DATA FIELD	MST39280
2D56	4810 196C	3929	LDA R1,WTFADR		MST39290
2D5A	2400	3930	LIS R0,0		MST39300
2D5C	4001 0112	3931	STH R0,PRECL-2(R1)		MST39310
		3932	*		MST39320
2D60	C800 2D98	3933	LDAI R0,REF.3	RERUN ADDRESS	MST39330
2D64	4000 197E	3934	STA R0,RERN		MST39340
2D68	2400	3935	LIS SECT,0		MST39350
2D6A	C800 0605	3936	REF.1 LHI R0,X'0605'	FORMAT WRITE/READ COMMANDS	MST39360
2D6E	4000 1900	3937	STH R0,WCMD		MST39370
2D72	41F0 34E6	3938	BAL R15,HEADER	SET UP GOOD HEADER	MST39380
2D7E	4800 192A	3939	LH R0,LRCC		MST39390

## SYSTEM TEST SEQUENCES - TEST 17

2D7A	4001 0112	3940	STH	R0,PRECL-2(R1)	CORRECT CKSUM	MST39400
2D7E	C800 0113	3941	LHI	R0,PRECL-1		MST39410
2D82	4000 1964	3942	STA	R0,SIZE		MST39420
2D86	41F0 32EC	3943	BAL	RETN,WRIT	WRITE CORRECT SECTOR	MST39430
2D8A	41F0 369E	3944	BAL	R15,CKADSRX	READ-CHECK.	MST39440
2D8E	41F0 32CA	3945	BAL	RETN,READ	FORMAT READ	MST39450
2D92	41F0 3274	3946	BAL	R15,TDATA	TEST DATA READ	MST39460
2D96	2303	3947	BS	REF.4	CONTINUE IF NO ERRORS.	MST39470
2D98	41E0 3590	3948	BAL	R14,FLAGIT	FLAG SECTOR, TEST FLAG.	MST39480
2D9C	2601	3949	AIS	SECT,1		MST39490
2D9E	C500 0040	3950	CLHI	SECT,MAXSEC		MST39500
2DA2	4280 2D6A	3951	BL	REF.1		MST39510
		3952	*			MST39520
2DA6	C800 3CF2	3953	LDAI	R0,EURC	WILL SAY 'FORMAT ABORTED' ON ERROR -	MST39530
2DAA	4000 197E	3954	STA	R0,RERN	RERUN ADDRESS	MST39540
2DAE	41F0 3518	3955	BAL	R15,ERAMK	ERASE ADDRESS MARK FOR SECT X'40'	MST39550
2DB2	2501	3956	LCS	R0,1		MST39560
2DB4	4000 1982	3957	STA	R0,ERRFLG	UNCONDITIONAL RETURN:	MST39570
2DB8	41F0 32DA	3958	BAL	RETN,READX	ATTEMPT READ	MST39580
2DBC	41F0 34E6	3959	BAL	R15,HEADER	SET UP SECTOR HEADER IMAGE	MST39590
2DC0	4820 196A	3960	LDA	R2,RDFADR		MST39600
2DC4	0361 0002	3961	LB	WK0,2(R1)	HEADER BYTE 3 IMAGE	MST39610
2DC8	0372 0002	3962	LB	WK1,2(R2)	HEADER BYTE 3 READ	MST39620
2DCC	0767	3963	XAR	WK0,WK1		MST39630
2DCE	4761 0000	3964	XH	WK0,0(R1)	HEADER BYTES 1 & 2 IMAGE	MST39640
2DD2	4762 0000	3965	XH	WK0,0(R2)	HEADER BYTES 1 & 2 READ	MST39650
2DDE	2336	3966	BZS	REF.6	BRANCH: HEADER MATCH, SECTOR X'40'.	MST39660
2DD8	2400	3967	LIS	R0,0		MST39670
2DDA	4000 1926	3968	STH	R0,RFMTFLG	PROPER FORMAT RESTORED	MST39680
2DDE	4300 0E50	3969	B	KEEP7	NORMAL EXIT: RUN ONLY ONCE .	MST39690
2DE2	2501	3970	LCS	R0,1		MST39700
2DE4	4000 166E	3971	STH	R0,NOERR	SUPPRESS THAT PRINT	MST39710
2DE8	E150 1C26	3972	SVC	5,MSG35	'ALTERNATE SECTOR ASSIGNED'	MST39720
2DEC	4300 3CF2	3973	B	EURC	ABORT RE-FORMAT.	MST39730

## SYSTEM TEST SEQUENCES - TEST 18

```

3975 * *****
3976 *
3977 *           T E S T   1 8
3978 *
3979 * PURPOSE OF TEST:
3980 * TEST 18 CHECKS PROPER OPERATION OF THE ROTATIONAL-POSITION-SENSE
3981 * LOGIC FOR THE SELECTED DRIVE, USING A SELECTABLE TRACK.
3982 *
3983 * ASSUMPTIONS:
3984 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE
3985 * CHANNEL. NO SECTORS MAY BE ALTERNATED OR DEFECTIVE. PROPER FORMAT
3986 * IS REQUIRED. THE CORRECT 'TIMVAL' OPTION *MUST* BE USED.
3987 *
3988 * DESIGN SPECIFICATIONS:
3989 * IF THE 'SCOPE' OPTION IS ZERO (0), A READ-CHECK IS PERFORMED FOR
3990 * EACH SECTOR THROUGH X'3F', AND THE RPS COUNT IS CHECKED AFTER
3991 * CONTROLLER IDLE, FOR EACH SECTOR ON THE TRACK SPECIFIED BY THE
3992 * LOCYL AND SECTOR OPTIONS.
3993 * IF THE 'SCOPE' OPTION IS NON-ZERO, THE SECTOR SPECIFIED BY THE
3994 * 'SECTOR' OPTION IS TESTED, ONLY. IN THIS CASE, THE TEST TERMINATES
3995 * AFTER 1500 ITERATIONS, OR WHEN THE 'BREAK' KEY IS DEPRESSED.
3996 * SECTOR X'40' MAY NOT BE TESTED IN THIS MODE.
3997 *
3998 * HOW TO RUN THE TEST:
3999 * ENTER THE APPROPRIATE VALUES FOR THE DISCON, DRIVE, LOCYL, SECTOR,
4000 * AND SCOPE OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION
4001 * IS REQUIRED.
4002 *
4003 * OPTIONS:
4004 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR
4005 * INBUF, SCOPE (SEE ABOVE).
4006 *
4007 * ERRORS:
4008 * 180000 - 18FFFF
4009 *
2DF0  41F0 1FC8 4010 TEST18  EAL  RETN,MODINIT
2DF4  0083      4011          DCX  0083          TSECT; NO ABORT; EVALUATE.
2DF6  C810 05DC 4012          LHI  R1,1500
2DFA  4010 1950 4013          STH  R1,COUNTER
2DFE  4800 17E8 4014          LH   R0,SCOPE+6      RUNNING SCOPE LOOP ?
2E02  2134      4015          BNZS TST18.1      BRANCH: YES.
2E04  2400      4016          LIS  SECT,0        START WITH SECTOR 0
2E06  40D0 1924 4017          STH  SECT,FLAGS    NO SPECIAL FLAGS.
2E0A  41F0 369E 4018 *
2E0E  C81D 0001 4019 TST18.1  BAL  R15,CKADSRX    READ-CHECK THE SECTOR
2E12  C510 0040 4020          LHI  R1,1(SECT)
2E16  2182      4021          CLHI R1,MAXSEC     EXPECTING ZERO ?
2E18  2410      4022          BLS  TST18.2      BRANCH: NO.
2E1A  4010 1938 4023          LIS  R1,0        MAXSEC YIELDS COUNT = 0
2E1E  C8C0 0080 4024 TST18.2  STH  R1,ERPSCNT    EXPECTED RPS VALUE
2E22  40C0 1936 4025          LHI  OPKEY,X'80'
2E26  E180 3DC6 4026          STH  OPKEY,OPCODE =TESTING DRIVE RPS
4027          SVC  8,PBLK22  TEST ACTUAL RPS COUNT
MST39750
MST39760
MST39770
MST39780
MST39790
MST39800
MST39810
MST39820
MST39830
MST39840
MST39850
MST39860
MST39870
MST39880
MST39890
MST39900
MST39910
MST39920
MST39930
MST39940
MST39950
MST39960
MST39970
MST39980
MST39990
MST40000
MST40010
MST40020
MST40030
MST40040
MST40050
MST40060
MST40070
MST40080
MST40090
MST40100
MST40110
MST40120
MST40130
MST40140
MST40150
MST40160
MST40170
MST40180
MST40190
MST40200
MST40210
MST40220
MST40230
MST40240
MST40250
MST40260
MST40270

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## SYSTEM TEST SEQUENCES - TEST 18

2E2A	4800	17E8	4028	*								MST40280
2E2E	2334		4029	TST18.3	LH	RO,SCOPE+6		SCOPE LOOP RUNNING ?				MST40290
2E30	41F0	377E	4030		BZS	TST18.4		BRANCH: NO.				MST40300
2E34	2E0A		4031		BAL	R15,CNTDOWN		LCCP OR EXIT				MST40310
			4032		DAC	TST18.1						MST40320
			4033	*								MST40330
2E36	26D1		4034	TST18.4	AIS	SECT,1		(NORMAL TEST)				MST40340
2E38	C5D0	0040	4035		CLHI	SECT,MAXSEC						MST40350
2E3C	4280	2E0A	4036		BL	TST18.1		CONTINUE...				MST40360
2E40	4300	0E32	4037		B	TSTEND		OR EXIT.				MST40370



## SYSTEM TEST SEQUENCES - TEST 19

```

4039 * *****
4040 *
4041 *           T E S T   1 9
4042 *
4043 * PURPOSE OF TEST:
4044 * TEST 19 PERFORMS A TEST OF THE 'CFF-LINE' READ AND WRITE FORMAT
4045 * AND SECTOR ALTERNATION FUNCTIONS.
4046 *
4047 * ASSUMPTIONS:
4048 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE
4049 * CHANNEL. THE DRIVE MUST NOT BE WRITE-PROTECTED. THE CONTROLLER FORMAT
4050 * SWITCH MUST BE IN THE 'FORMAT' POSITION. THE TRACK USED MUST
4051 * BE DEFECT-FREE. THE CORRECT 'TIMVAL' OPTION *MUST* BE USED.
4052 *
4053 * DESIGN SPECIFICATIONS:
4054 * THE SELCH IS SET UP TO WRITE ONE HALFWORD TO THE CONTROLLER, AND THE
4055 * CONTROLLER IS COMMANDED TO 'WRITE FORMAT OFFLINE' TO THE TRACK
4056 * INDICATED BY THE 'LOCYL' AND 'SECTOR' OPTIONS. UPON COMPLETION, THE
4057 * RPS COUNT IS CHECKED. THEN, A 'READ FORMAT OFFLINE' OPERATION
4058 * IS PERFORMED, ON THE SAME TRACK. THE RPS COUNT IS AGAIN TESTED.
4059 * EACH SECTOR THROUGH AND INCLUDING X'3F' IS THEN FORMATTED WITH
4060 * CORRECT SECTOR HEADERS, AND EACH OF THESE 64 SECTORS IS READ.
4061 * THE ADDRESS MARK IS ERASED FOR THE SECTOR SPECIFIED BY THE 'SECTOR'
4062 * OPTION, AND SECTOR NUMBERS 0-3F ESTABLISHED IN THE REMAINING SECTORS.
4063 * A READ-CHECK IS PERFORMED ON LOGICAL SECTORS 0-3F WITH NORMAL ERROR
4064 * CHECKING; A REFORMAT ERASES THE ADDRESS MARK FOR SECTOR
4065 * X'40', AND THE TEST TERMINATES.
4066 *
4067 * HOW TO RUN THE TEST:
4068 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
4069 * PACTYP, RETRY, SECNUM, INBUF, OUTBUF, AND SECTOR OPTIONS, THEN
4070 * ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.
4071 *
4072 * OPTIONS:
4073 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
4074 * OUTBUF, INBUF
4075 *
4076 * ERRORS:
4077 * 190000 - 19FFFF
4078 *
2E44 41F0 1FC8 4075 TEST19 BAL RETN,MODINIT
2E48 0085 4080 DCX 0085 65 SECTORS; EVALUATE; TSECT.
2E4A 2401 4081 LIS R0,1
2E4C 4000 1964 4082 STA R0,SIZE SET TO TRANSFER 1 HALFWORD
2E50 41F0 3212 4083 BAL R15,WCASFILL SET UP BUFFER
2E54 C800 0704 4084 LHI R0,X'0704' OFFLINE WRITE/READ CMDS
2E58 4000 1900 4085 STH R0,WCMD
2E5C 24D0 4086 LIS SECT,0
2E5E 40D0 1938 4087 STH SECT,ERPSCAT SET EXPECTED RPS COUNT = 0
2E62 C8C0 0062 4088 LHI OPKEY,X'62'
2E66 40C0 1936 4089 STH OPKEY,OPCODE =OFFLINE WRITE FORMAT
2E6A C800 3DB6 4090 LDAI R0,PBLK16 TO TEST CTRLR STATUS = X'02'
2E6E 4000 1982 4091 STA R0,ERRFLG
MST40350
MST40400
MST40410
MST40420
MST40430
MST40440
MST40450
MST40460
MST40470
MST40480
MST40490
MST40500
MST40510
MST40520
MST40530
MST40540
MST40550
MST40560
MST40570
MST40580
MST40590
MST40600
MST40610
MST40620
MST40630
MST40640
MST40650
MST40660
MST40670
MST40680
MST40690
MST40700
MST40710
MST40720
MST40730
MST40740
MST40750
MST40760
MST40770
MST40780
MST40790
MST40800
MST40810
MST40820
MST40830
MST40840
MST40850
MST40860
MST40870
MST40880
MST40890
MST40900
MST40910

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## SYSTEM TEST SEQUENCES - TEST 19

2E72	41F0 32FC	4092	BAL	RETN,WRITX	OFFLINE WRITE	MST40920
2E76	E180 3DC6	4093	SVC	8,PBLK22	TEST RFS COUNT = 0	MST40930
2E7A	C8C0 0072	4094	LHI	OPKEY,X*72*		MST40940
2E7E	40C0 1936	4095	STH	OPKEY,CPCODE	=OFFLINE READ FORMAT	MST40950
2E82	41F0 32DA	4096	BAL	RETN,READX	OFFLINE READ	MST40960
2E86	E180 3DC6	4097	SVC	8,PBLK22	TEST RFS COUNT = 0 & CTRLR IDLE	MST40970
		4098	*			MST40980
2E8A	C800 0605	4099	LHI	RO,X*0605*	FORMAT WRITE/READ CMDS	MST40990
2E8E	4000 1900	4100	STH	RO,WCMD		MST41000
2E92	24D0	4101	LIS	SECT,0		MST41010
2E94	C800 0113	4102	LHI	RO,PRECL-1		MST41020
2E98	4000 1964	4103	STA	RO,SIZE		MST41030
2E9C	41F0 3212	4104	BAL	R15,WCAFILL	FILL WRITE BUFFER FOR COMPARE:	MST41040
2EA0	41F0 32CA	4105	TST19.3	BAL R15,READ	READ BACK 'OFF-LINE' DATA WRITTEN	MST41050
2EA4	41F0 3274	4106	BAL	R15,TDATA	TEST DATA READ	MST41060
2EA8	26D1	4107	AIS	SECT,1		MST41070
2EAA	C5D0 0040	4108	CLHI	SECT,MAXSEC	HAS X*3F* BEEN DONE ?	MST41080
2EAE	2087	4109	BLS	TST19.3	BRANCH: NO.	MST41090
		4110	*			MST41100
2EB0	41F0 3136	4111	BAL	R15,FMSUDF	SET UP PROPER FORMAT	MST41110
2EB4	41F0 34E6	4112	TST19.4	BAL R15,HEADER	AND HEADER;	MST41120
2EB8	4800 192A	4113	LH	RO,LRCC		MST41130
2EBC	4001 0112	4114	STH	RO,PRECL-2(R1)	CORRECT LRCC.	MST41140
2EC0	41F0 32EC	4115	BAL	R15,WRIT	WRITE PROPER FORMAT.	MST41150
2EC4	26D1	4116	AIS	SECT,1		MST41160
2EC6	C5D0 0040	4117	CLHI	SECT,MAXSEC		MST41170
2ECA	2088	4118	BLS	TST19.4	CONTINUE.	MST41180
		4119	*			MST41190
2ECC	2400	4120	LIS	RO,0		MST41200
2ECE	4000 1948	4121	STH	RO,CURSECT2	SET PHYSICAL/LOGICAL SECTOR 0	MST41210
2ED2	D3D0 1949	4122	TST19.5	LB SECT,CURSECT2+1	LOGICAL SECTOR NUMBER	MST41220
2ED6	41F0 34E6	4123	BAL	R15,HEADER	SET UP SECTOR HEADER	MST41230
2EDA	C3D0 1948	4124	LB	SECT,CURSECT2	PHYSICAL SECTOR NUMBER	MST41240
2EDE	D4D0 1771	4125	CLB	SECT,SECTOR+7	TO BE ALTERNATED ?	MST41250
2EE2	2138	4126	BNES	TST19.6	BRANCH: NO.	MST41260
2EE4	41F0 3518	4127	BAL	R15,ERAMK	ERASE ADDRESS MARK FOR IT.	MST41270
2EE8	C800 0001	4128	LHI	RO,1(SECT)		MST41280
2EEC	D200 1948	4129	STB	RO,CURSECT2	ADVANCE PHYSICAL SECTOR NUMBER	MST41290
2EF0	220F	4130	BS	TST19.5	CONTINUE TO NEXT...	MST41300
2EF2	41F0 32EC	4131	TST19.6	BAL R15,WRIT	WRITE THE SECTOR.	MST41310
		4132	*			MST41320
2EF6	4800 1948	4133	TST19.7	LH RO,CURSECT2	LOAD COUNTERS	MST41330
2EFA	CA00 0101	4134	AHI	RO,X*0101*	AND INCREMENT.	MST41340
2EFE	4000 1948	4135	STH	RO,CURSECT2		MST41350
2F02	9300	4136	LBR	RO,RO	EXTRACT LOGICAL SECTOR NUMBER	MST41360
2F04	C500 0040	4137	CLHI	RO,MAXSEC	ALL DONE ?	MST41370
2F08	4280 2ED2	4138	BL	TST19.5	BRANCH: NOT YET.	MST41380
		4139	*			MST41390
2F0C	24D0	4140	LIS	SECT,0		MST41400
2F0E	41F0 369E	4141	TST19.8	BAL R15,CKADSRX	READ-CHECK THE SECTOR	MST41410
2F12	C81D 0001	4142	LHI	R1,1(SECT)		MST41420
2F16	D4D0 1771	4143	CLB	SECT,SECTOR+7	HAVE WE PASSED ALTERNATION POINT ?	MST41430
2F1A	2182	4144	BLS	TST19.8A	BRANCH: NO.	MST41440

## SYSTEM TEST SEQUENCES - TEST 19

2F1C	2611	4145	AIS	R1,1		MST41450
2F1E	C510 0040	4146	TST19.8A	CLHI	R1,MAXSEC	MST41460
2F22	2185	4147		BLS	TST19.9	MST41470
2F24	CB10 0040	4148		SHI	R1,MAXSEC	MST41480
2F28	4230 3D20	4149		BNZ	TESTAUT1	MST41490
2F2C	4010 1938	4150	TST19.9	STH	R1,ERPSCNT	MST41500
2F30	E180 3DC6	4151		SVC	8,PBLK22	MST41510
2F34	2601	4152		AIS	SECT,1	MST41520
2F3E	C500 0040	4153		CLHI	SECT,MAXSEC	MST41530
2F3A	4280 2F0E	4154		BL	TST19.8	MST41540
2F3E	4300 3D20	4155		B	TESTAUT1	MST41550

SHOULD RPS BE 0 ?  
BRANCH: NO.  
STILL VALID ?  
BRANCH: SECTGR X\*40' CHECK INVALID.  
EXPECTED RPS COUNT.  
TEST RPS & CTRLR IDLE

ALL DONE ?  
BRANCH: NO.  
CLEAN UP TRACK.

## SYSTEM TEST SEQUENCES - TEST 1A

	4157	*	*****		MST41570
	4158	*			MST41580
	4159	*	TEST 1A		MST41590
	4160	*			MST41600
	4161	*	PURPOSE OF TEST:		MST41610
	4162	*	TEST 1A ENSURES THE CONTROLLER STOPS WRITING TO THE DISC WHEN		MST41620
	4163	*	REQUIRED. DEFECT-FREE, ALTERNATED, AND DEFECTIVE-FLAGGED		MST41630
	4164	*	ALTERNATED SECTORS ARE TESTED.		MST41640
	4165	*			MST41650
	4166	*	ASSUMPTIONS:		MST41660
	4167	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE		MST41670
	4168	*	CHANNEL. THE DRIVE MUST NOT BE WRITE-PROTECTED. THE CONTROLLER FORMAT		MST41680
	4169	*	SWITCH MUST BE IN THE 'FORMAT' POSITION.		MST41690
	4170	*			MST41700
	4171	*	DESIGN SPECIFICATIONS:		MST41710
	4172	*	SECTORS X'00' - X'3D' ARE WRITTEN PROPERLY, AND SECTOR X'3E' IS		MST41720
	4173	*	ALTERNATED TO PHYSICAL SECTOR X'3F' AFTER THE ADDRESS MARK FOR		MST41730
	4174	*	X'3E' IS ERASED. SECTOR X'3F' IS WRITTEN TO PHYSICAL SECTOR X'40',		MST41740
	4175	*	AND LOGICAL SECTORS X'3E' AND X'3F' ARE FLAGGED AS DEFECTIVE.		MST41750
	4176	*	EACH SECTOR ON THE TRACK IS READ, FIRST ALL THE EVENS, THEN ALL THE		MST41760
	4177	*	ODDS. PROPER STATUS IS REQUIRED, AS DETAILED ABOVE.		MST41770
	4178	*	SECTOR 0 OF THE FOLLOWING HEAD IS TESTED FOR BEING OVERWRITTEN;		MST41780
	4179	*	THE TEST THEN TERMINATES.		MST41790
	4180	*			MST41800
	4181	*	HOW TO RUN THE TEST:		MST41810
	4182	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,		MST41820
	4183	*	RETRY, PACTYP, AND SECTOR OPTIONS. THEN ENTER 'RUN'.		MST41830
	4184	*	NO MANUAL INTERVENTION IS NECESSARY.		MST41840
	4185	*			MST41850
	4186	*	OPTIONS:		MST41860
	4187	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL,		MST41870
	4188	*	OUTBUF, INBUF, BYCKAD		MST41880
	4189	*			MST41890
	4190	*	ERRORS:		MST41900
	4191	*	1A0000 - 1AFFFF		MST41910
	4192	*			MST41920
	4193	TEST1A	BAL	RETN,MODINIT	MST41930
2F42	41F0	1FC8			
2F46	0085				MST41940
2F48	C800	00FF		65 SECTORS; EVALUATE; TSECT.	MST41950
2F4C	4000	1964	LHI	R0,LRECL-1	MST41960
2F50	41F0	3212	STA	R0,SIZE	MST41970
2F54	4810	196C	BAL	R15,WCASFILL	MST41980
2F58	2460		LDA	R1,WTFADR	MST41990
2F5A	4061	0112	LIS	WK0,0	MST42000
2F5E	41F0	3136	STH	WK0,PRECL-2(R1)	MST42010
2F62	25D1		BAL	R15,FMSUDF	MST42020
2F64	C800	0605	LCS	SECT,1	MST42030
2F68	4000	1900	LHI	R0,X'0605'	MST42040
2F6C	26D1		STH	R0,WCMD	MST42050
2F6E	41F0	34E6	STH	WCM1	MST42060
2F72	41F0	32EC	STH	WCM2	MST42070
2F76	C5D0	003E	CLHI	SECT,MAXSEC-2	MST42080
2F7A	2087		BLS	TST1A.1	MST42090
				FORMAT WRITE/READ COMMANDS	
				SET GOOD LRC CHECKWORD	
				SET UP SECTOR FORMAT	
				SET PROPER HEADER	
				WRITE PROPER FORMAT	
				X'3E' WILL BE ALTERNATED...	
				BRANCH: NORMAL SECTORS	

## SYSTEM TEST SEQUENCES - TEST 1A

		4210	*				MST42100
2F7C	41F0 3518	4211		BAL	R15,ERAMK	ERASE ADRS MARK FOR SECTOR '3E'	MST42110
2F80	41F0 34E6	4212	TST1A.2	BAL	R15,HEADER	HEADER FOR ALTERNATED SECTOR	MST42120
2F84	C80D 0080	4213		LHI	RO,X'80'(SECT)		MST42130
2F88	D201 0000	4214		STB	RO,0(R1)	FLAGGED AS DEFECTIVE,	MST42140
2F8C	26D1	4215		AIS	SECT,1		MST42150
2F8E	41F0 32EC	4216		BAL	R15,WRIT	ALTERNATED TO X'3F' PHYSICAL.	MST42160
2F92	C5D0 0040	4217		CLHI	SECT,MAXSEC		MST42170
2F96	208B	4218		BLS	TST1A.2	FLAG X'3F' DEFECTIVE (8 X'40')	MST42180
		4219	*				MST42190
2F98	C800 0201	4220		LHI	RO,X'0201'		MST42200
2F9C	4000 1900	4221		STH	RO,WCMD	NORMAL MODE WRITE/READ COMMANDS	MST42210
2FA0	24D0	4222		LIS	SECT,0	STARTING WITH 'EVEN' SECTORS;	MST42220
2FA2	C800 00FF	4223		LHI	RO,LRECL-1		MST42230
2FAE	4000 1964	4224		STA	RO,SIZE		MST42240
2FAA	C800 3DA6	4225	TST1A.3	LDAI	RO,PBLKOE	TO TEST CTRLR STATUS = X'02'	MST42250
2FAE	C5D0 003E	4226		CLHI	SECT,MAXSEC-2	WAS SECTOR FLAGGED DEFECTIVE ?	MST42260
2FB2	2183	4227		BLS	TST1A.4	BRANCH: NO.	MST42270
2FB4	C800 3D8E	4228		LDAI	RO,PBLK08	TO TEST CTRLR STATUS = X'2E'	MST42280
2FB8	C8C0 0070	4229	TST1A.4	LHI	OPKEY,X'70'		MST42290
2FBC	40C0 1936	4230		STH	OPKEY,OPCODE	=READ OPERATION	MST42300
2FC0	4000 1982	4231		STA	RO,ERRFLG		MST42310
2FC4	41F0 32DA	4232		BAL	R15,READX	ATTEMPT READ.	MST42320
2FC8	26D2	4233		AIS	SECT,2		MST42330
2FCA	C5D0 0040	4234		CLHI	SECT,MAXSEC	ALL DONE ?	MST42340
2FCE	4280 2FAA	4235		BL	TST1A.3	BRANCH: NO.	MST42350
2FD2	C8D0 0040	4236		SHI	SECT,MAXSEC	REVERT TO 0/1	MST42360
2FD6	C7D0 0001	4237		XHI	SECT,1		MST42370
2FDA	4230 2FAA	4238		BNZ	TST1A.3	CONTINUE WITH 'ODD' SECTORS...	MST42380
		4239	*				MST42390
2FDE	2400	4240		LIS	RO,0		MST42400
2FE0	9E30	4241		OCR	DCAD,RO	CLEAR COMMAND REGISTER IN CTRLR	MST42410
2FE2	41E0 3456	4242		BAL	R14,CWAIT	WAIT FOR 'IDLE'	MST42420
2FE6	000F	4243		DCX	000F		MST42430
		4244	*				MST42440
2FE8	4800 194A	4245		LH	RO,HEAD		MST42450
2FEC	2601	4246		AIS	RO,1		MST42460
2FEE	4500 1920	4247		CLH	RO,MAXHEAD	DOES 'NEXT HEAD' EXIST ?	MST42470
2FF2	2386	4248		BNLS	TST1A.5	BRANCH: NO.	MST42480
2FF4	4000 194A	4249		STH	RO,HEAD		MST42490
2FF8	24D0	4250		LIS	SECT,0	SECTOR 0 SHOULD BE GOOD.	MST42500
2FFA	41F0 32CA	4251		BAL	R15,READ		MST42510
2FFE	4300 3D20	4252	TST1A.5	B	TESTAUT1	CLEAN UP TRACK	MST42520

## SYSTEM TEST SEQUENCES - TEST 1B

		4254	*	*****				MST42540
		4255	*					MST42550
		4256	*	TEST 1 B				MST42560
		4257	*					MST42570
		4258	*	PURPOSE OF TEST:				MST42580
		4259	*	TEST 1B IS A SCOPE LOOP WHICH PERMITS ERASING THE ADDRESS MARK FOR				MST42590
		4260	*	ANY SPECIFIED PHYSICAL SECTOR.				MST42600
		4261	*					MST42610
		4262	*	ASSUMPTIONS:				MST42620
		4263	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE				MST42630
		4264	*	CHANNEL. THE DRIVE MUST NOT BE WRITE-PROTECTED. THE CONTROLLER FORMAT				MST42640
		4265	*	SWITCH MUST BE IN THE 'FORMAT' POSITION. SCOPE 1 & 3 INVALID.				MST42650
		4266	*					MST42660
		4267	*	DESIGN SPECIFICATIONS:				MST42670
		4268	*	THE ADDRESS MARK FOR THE SPECIFIED SECTOR IS ERASED. A NORMAL-MODE				MST42680
		4269	*	READ OF THE SECTOR IS THEN ATTEMPTED, ACCORDING TO THE SCOPE OPTION.				MST42690
		4270	*	THE TEST TERMINATES AFTER 1500 ITERATIONS.				MST42700
		4271	*					MST42710
		4272	*	HOW TO RUN THE TEST:				MST42720
		4273	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,				MST42730
		4274	*	PACTYP, SECTOR, AND SCOPE OPTIONS. THEN ENTER 'RUN'.				MST42740
		4275	*	THE CORRECT 'INVAL' OPTION *MUST* BE USED.				MST42750
		4276	*	NO MANUAL INTERVENTION IS NECESSARY.				MST42760
		4277	*					MST42770
		4278	*	OPTIONS:				MST42780
		4279	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, CUTBUF,				MST42790
		4280	*	INBUF, SECTOR, BYCKAD, SCOPE				MST42800
		4281	*					MST42810
		4282	*	ERRORS:				MST42820
		4283	*	180000 - 1BFFFF				MST42830
		4284	*					MST42840
3002	41F0 1FC8	4285	TEST1B	BAL	RETN,MODINIT			MST42850
3006	0097	4286		DCX	0097	NO ABORT; 65 SECTORS; EVALUATE;		MST42860
		4287	*			SCOPE 1&3 INVALID; TSECT.		MST42870
3008	C800 05DC	4288		LHI	R0,1500			MST42880
300C	4000 1950	4289		STH	R0,COUNTER			MST42890
3010	C800 3088	4290		LDAI	R0,TST1B.2			MST42900
3014	4000 197E	4291		STA	R0,RERN	RERUN ADDRESS		MST42910
3018	C800 00FF	4292		LHI	R0,LRECL-1			MST42920
301C	4000 1964	4293		STA	R0,SIZE			MST42930
3020	41F0 3518	4294	TST1B.1	BAL	R15,ERAMK	ERASE SPECIFIED ADDRESS MARK		MST42940
3024	C800 0205	4295		LHI	R0,X'0205'			MST42950
3028	4000 1900	4296		STH	R0,WCMD	NORMAL WRITE/FORMAT READ COMMANDS		MST42960
302C	2501	4297		LCS	R0,1			MST42970
302E	4000 1982	4298		STA	R0,ERRFLG	UNCONDITIONAL RETURN:		MST42980
3032	C8C0 0090	4299		LHI	OPKEY,X'90'	=TESTING CTRLR ERROR STATUS		MST42990
3036	40C0 1936	4300		STH	OPKEY,OPCODE			MST43000
303A	C800 00FF	4301		LHI	R0,LRECL-1			MST43010
303E	4000 1964	4302		STA	R0,SIZE	SET UP FOR ONE LOGICAL SECTOR		MST43020
3042	41F0 32FC	4303		BAL	R15,WRITX	ATTEMPT WRITE		MST43030
3046	E130 3D7E	4304		SVC	3,PBLK04	TEST DRIVE STATUS = X'00'		MST43040
		4305	*					MST43050
304A	4800 17E8	4306		LH	R0,SCOPE+6			MST43060

SYSTEM TEST SEQUENCES - TEST 1B

304E	4230 3088	4307	BNZ	TST1B.2	BRANCH: SCOPE = 2 (WRITE-ONLY)	MST43070
3052	C8C0 0090	4308	LHI	OPKEY,X'90'	=TESTING CTRLR ERROR STATUS	MST43080
3056	40C0 1936	4309	STH	OPKEY,OPCODE		MST43090
305A	41F0 32DA	4310	BAL	R15,READX	ATTEMPT READ	MST43100
305E	E130 3D7E	4311	SVC	3,PBLK04	TEST DRIVE STATUS = X'00'	MST43110
		4312				MST43120
3052	41F0 34E6	4313	BAL	R15,HEADER	SET UP SECTOR HEADER IMAGE	MST43130
3066	4820 196A	4314	LDA	R2,RDFADR		MST43140
306A	C361 0002	4315	LB	WK0,2(R1)	HEADER BYTE 3 IMAGE	MST43150
306E	D372 0002	4316	LB	WK1,2(R2)	HEADER BYTE 3 READ	MST43160
3072	0767	4317	XAR	WK0,WK1		MST43170
3074	4761 0000	4318	XH	WK0,0(R1)	HEADER BYTES 1 & 2 IMAGE	MST43180
3078	4762 0000	4319	XH	WK0,0(R2)	HEADER BYTES 1 & 2 READ	MST43190
307C	2136	4320	BNZS	TST1B.2	BRANCH: HEADER DOES NOT MATCH.	MST43200
307E	2411	4321	LIS	R1,1		MST43210
3080	6110 1678	4322	AHM	R1,TOTERR	INCREMENT ETPE ERROR COUNTER	MST43220
3084	E150 1C26	4323	SVC	5,MS635	'ALTERNATE SECTOR ASSIGNED'	MST43230
3088	41F0 377E	4324	EAL	R15,CNTDOWN	LOOP, OR EXIT.	MST43240
308C	3020	4325	DAC	TST1B.1	CONTINUATION VECTOR	MST43250

## SYSTEM TEST SEQUENCES - TEST 1C

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4327 * *****
4328 *
4329 *           T E S T   1 C
4330 *
4331 * PURPOSE OF TEST:
4332 * TEST 1C PROVIDES A READ FORMAT OFF-LINE/WRITE FORMAT OFF-LINE SCOPE
4333 * LOOP FOR ANY SELECTED TRACK.
4334 *
4335 * ASSUMPTIONS:
4336 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE
4337 * CHANNEL. THE DRIVE MUST NOT BE WRITE-PROTECTED. THE CONTROLLER FORMAT
4338 * SWITCH MUST BE IN THE 'FORMAT' POSITION.
4339 *
4340 * DESIGN SPECIFICATIONS:
4341 * THE TRACK IS READ/WITTEN IN THE OFF-LINE FORMAT MODE, BEGINNING
4342 * WITH THE SECTOR SPECIFIED BY THE 'SECTOR' OPTION. FOR A WRITE, THE
4343 * SELCH IS SET UP FOR A 1-HALFWORD TRANSFER OF THE WORST-CASE DATA
4344 * PATTERN SPECIFIED BY THE 'DATA' OPTION. FOR A READ, THE SELCH IS
4345 * SET UP TO TRANSFER THE DATA FROM ONE PHYSICAL SECTOR INTO
4346 * MEMORY (NORMAL-MODE CHECKSUM BYTE IS NOT REAC). IF SCOPE = 3, THE
4347 * THE DATA READ IS TESTED. THE TEST TERMINATES AFTER 1500 ITERATIONS.
4348 *
4349 * HOW TO RUN THE TEST:
4350 * ENTER THE APPROPRIATE SELCH, DISCON, DRIVE, LOCYL, SECTOR, AND SCOPE
4351 * OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.
4352 *
4353 * OPTIONS:
4354 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
4355 * OUTBUF, INBUF, BYCKAC, DATA
4356 *
4357 * ERRORS:
4358 * 1C0000 - 1CFFFF
4359 *
308E 41F0 1FC8 4360 TEST1C BAL RETN,MODINIT
3092 0087 4361 DCX 0087 65 SECTS; NO ABORT; EVALUATE; TSECT.
3094 C800 05DC 4362 LHI R0,1500
3098 4000 1950 4363 STH R0,COUNTER
309C C800 0704 4364 LHI R0,X'0704' WRITE/READ FORMAT OFF-LINE COMMANDS
30A0 4000 1900 4365 STH R0,WCHD
30A4 2400 4366 LIS R0,0
30A6 4000 1938 4367 STH R0,ERPSCNT EXPECTED RPS COUNT
30AA C800 3DB6 4368 LDAI R0,PBLK16 10 TEST CTRLR STATUS = X'02'
30AE 4000 1982 4369 STA R0,ERRFLG
4370 *
30B2 4800 17E8 4371 TST1C.1 LH R0,SCOPE+6
30B6 2701 4372 SIS R0,1
30B8 4330 30E6 4373 BZ TST1C.3 BRANCH: SCOPE = 1 (READ-ONLY)
30BC C800 30DA 4374 LDAI R0,TST1C.2
30C0 4000 197E 4375 STA R0,RERN RERUN ADDRESS
30C4 2401 4376 LIS R0,1
30C6 4000 1964 4377 STA R0,SIZE SET UP 1-HALFWORD TRANSFER.
30CA 41F0 3212 4378 BAL R15,WCASFILL
30CE C8C0 0062 4379 LHI OPKEY,X'62'

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## SYSTEM TEST SEQUENCES - TEST 1C

30D2	40C0	1936	4380	STH	OPKEY,OPCODE	=CFF-LINE WRITE FORMAT	MST43800
30DE	41F0	32FC	4381	BAL	R15,WRITX		MST43810
30DA	C800	30E6	4382	TST1C.2	LDAI	RO,TST1C.3	MST43820
30DE	4000	197E	4383	STA	RO,RERN	RERUN ADDRESS	MST43830
30E2	E180	3DC6	4384	SVC	8,PBLK22	TEST RFS COUNT FROM WRITE	MST43840
			4385	*			MST43850
30EE	4800	17E8	4386	TST1C.3	LH	RO,SCOPE+6	MST43860
30EA	2702		4387	SIS	RO,2		MST43870
30EC	4330	3118	4388	BZ	TST1C.5	BRANCH: SCOPE = 2 (WRITE ONLY)	MST43880
30F0	C800	310C	4389	LDAI	RO,TST1C.4		MST43890
30F4	4000	197E	4390	STA	RO,RERN	RERUN ADDRESS	MST43900
30F8	C8C0	0072	4391	LHI	OPKEY,X'72'		MST43910
30FC	40C0	1936	4392	STH	OPKEY,OPCODE	=CFF-LINE READ FORMAT	MST43920
3100	C800	0111	4393	LHI	RO,PRECL-3	(WILL NOT READ NCRMAL-MODE LRCC)	MST43930
3104	4000	1964	4394	STA	RO,SIZE	SET UP FOR 1-SECTOR TRANSFER.	MST43940
3108	41F0	32DA	4395	BAL	R15,READX		MST43950
310C	C800	3118	4396	TST1C.4	LDAI	RO,TST1C.5	MST43960
3110	4000	197E	4397	STA	RO,RERN	RERUN ADDRESS	MST43970
3114	E180	3DC6	4398	SVC	8,PBLK22	TEST RFS COUNT FROM READ	MST43980
			4399	*			MST43990
3118	4800	17E8	4400	TST1C.5	LH	RO,SCOPE+6	MST44000
311C	2703		4401	SIS	RO,3		MST44010
311E	2139		4402	BNZS	TST1C.6	BRANCH: SCOPE = 0,1, OR 2.	MST44020
3120	C800	3130	4403	LDAI	RO,TST1C.6		MST44030
3124	4000	197E	4404	STA	RO,RERN	RERUN ADDRESS	MST44040
3128	41F0	3212	4405	BAL	R15,WCA5FILL	SET UP DATA IMAGE	MST44050
312C	41F0	3274	4406	BAL	R15,TDATA	TEST DATA READ.	MST44060
			4407	*			MST44070
3130	41F0	377E	4408	TST1C.6	BAL	R15,CNTDCWN	LOOP, OR EXIT.
3134	30B2		4409	CAC	TST1C.1	CONTINUATION VECTOR	MST44090

## TEST SEQUENCE SUPPORT ROUTINES

		4411 *	FORMAT MODE DATA FIELD SETUP		MST44110
		4412 *	LHI WK0,DATBYTES		MST44120
		4413 *	BAL RETN,FMSUDF		MST44130
		4414 *	DOES NOT ESTABLISH ADDRESS FIELD OR LRCC.		MST44140
		4415 *	REGISTERS DESTROYED: R0,R1,R14,WK1,WK2,WK3		MST44150
		4416 *			MST44160
3136	2411	4417	FMSUDF LIS R1,1		MST44170
3138	0300 190F	4418	FMSUDFA LB R0,GAP1		MST44180
313C	E3E0 1910	4419	LB R14,SYNC		MST44190
3140	4870 196C	4420	LDA WK1,WTFADR	WRITE BUFFER ADDRESS	MST44200
3144	C897 FFFE	4421	LHI WK3,-2(WK1)		MST44210
3148	2711	4422	FMSUO SIS R1,1		MST44220
314A	021F	4423	BMR RETN	RETURN.	MST44230
314C	2481	4424	LIS WK2,1		MST44240
314E	CA90 0010	4425	AHI WK3,GAPSIZE+2		MST44250
3152	D207 0003	4426	FMSU1 STB R0,3(WK1)	GAP1 BYTES	MST44260
3156	C170 3152	4427	BXLE WK1,FMSU1		MST44270
315A	D2E9 0003	4428	STB R14,3(WK3)	SYNC BYTE	MST44280
315E	2673	4429	AIS WK1,3		MST44290
3160	2482	4430	LIS WK2,2		MST44300
3162	C897 0100	4431	LHI WK3,LRECL(WK1)		MST44310
3166	4067 0000	4432	FMSU2 STH WK0,0(WK1)	DATA BYTES FROM CALLER	MST44320
316A	C170 3166	4433	BXLE WK1,FMSU2		MST44330
316E	4300 3148	4434	B FMSUO	TO DO WHOLE BLOCK.	MST44340
		4436 *	ROUTINE TESTS ORIGIN OF WRITE-PROTECT CONTROLLER STATUS		MST44360
		4437 *	CALLING SEQUENCE: BAL R15,STCHK		MST44370
		4438 *	DAC (CONTINUATION ON NOT WRITE-PROTECTED)		MST44380
		4439 *			MST44390
3172	9D5A	4440	STCHK SSR FUT,STAT	GET DRIVE STATUS	MST44400
3174	C3A0 0080	4441	THI STAT,WRTPRT	FROM DRIVE ?	MST44410
3178	2335	4442	BZS STCHK.1	BRANCH: NO.	MST44420
317A	E150 1A8B	4443	SVC 5,MSG13	'WRITE-PROTECT ON'	MST44430
317E	4300 31A4	4444	B STCHK.3		MST44440
3182	9D3A	4445	STCHK.1 SSR DCAD,STAT	GET CONTROLLER STATUS	MST44450
3184	C3A0 0080	4446	THI STAT,WRTPRT	FROM CONTROLLER ?	MST44460
3188	4330 3788	4447	BZ CONTINUE	BRANCH: NOT WRITE-PROTECT ERROR.	MST44470
318C	4800 1934	4448	LH R0,RWOCMD	GET CONTROLLER COMMAND	MST44480
3190	9003	4449	SRLS R0,3	FORMAT MODE ?	MST44490
3192	2384	4450	BNCS STCHK.2	BRANCH: NO.	MST44500
3194	E150 1B13	4451	SVC 5,MSG20	'CONTROLLER FORMAT SWITCH OFF'	MST44510
3198	2306	4452	BS STCHK.3		MST44520
319A	9002	4453	STCHK.2 SRLS R0,2	WRITE-WITH-PROTECTION ?	MST44530
319C	4380 3788	4454	BNC CONTINUE	BRANCH: NO (TAKE 'DAC' TRANSFER).	MST44540
31A0	E150 1B26	4455	SVC 5,MSG21	'PROTECTED WRITE VIOLATION'	MST44550
31A4	4300 3720	4456	STCHK.3 B FALLTHRU	ADVANCE PAST 'DAC' PARAMETER	MST44560
		4458 *	INTERRUPT SEEK SUBROUTINE		MST44580
		4459 *	BAL RETN2,INTSK		MST44590

## TEST SEQUENCE SUPPORT ROUTINES

		4460	* NORMAL RETURN		MST44600
		4461	* ENTERED WITH DESIRED CYL ACS IN REG "TRACK"		MST44610
		4462	*		MST44620
31A8	40E0 197C	4463	INTSK STA RETN2,INTSKR	SAVE RETURN ADDRESS	MST44630
31AC	41F0 33FC	4464	BAL R15,SETCYL		MST44640
31B0	C8C0 0020	4465	LHI OPKEY,X*20*		MST44650
31B4	40C0 1936	4466	STH OPKEY,OPCODE	=SEEK OPERATION	MST44660
31B8	DE50 1908	4467	CC FUT,ISKCPD	INTPT SEEK TC CYL	MST44670
31BC	C800 0200	4468	INTSK2 LHI R0,512		MST44680
31C0	2306	4469	BS INTSK4		MST44690
		4470	*		MST44700
31C2	480E 0000	4471	INTSK3 LH R0,0(RETN2)	CALLER'S SPECIAL TIME VALUE	MST44710
31C6	26E2	4472	AIS RETN2,2		MST44720
31C8	40E0 197C	4473	STA RETN2,INTSKR		MST44730
31CC	41E0 31E8	4474	INTSK4 BAL R14,ITMLP	WAIT FOR INTERRUPT	MST44740
		4476	* SEEK INTERRUPT		MST44760
		4477	*		MST44770
31D0	D3A0 164A	4478	SKINTA LB STAT,INTSTA	LOAD INTERRUPT STATUS	MST44780
31D4	48E0 197C	4479	LDA RETN2,INTSKR	LOAD RETURN ADDRESS	MST44790
31D8	C5E0 2256	4480	CLAI RETN2,TST4.1		MST44800
31DC	033E	4481	BER RETN2	TESTING SEEK IAC STATUS	MST44810
31DE	E100 3D7E	4482	SVC 0,PBLK04	TEST DRIVE INTPT STATUS = X*CC*	MST44820
31E2	E130 3D7E	4483	SVC 3,PBLK04	TEST AGAIN (SENSE STATUS)	MST44830
31EE	030E	4484	BR RETN2		MST44840
		4486	* INTERRUPT TIMER LOCP		MST44860
		4487	*		MST44870
31E8	0000 31E8	4488	ITMLP EQU *		MST44880
31E8	4860 0A24	4489	IFZ ADC-2		MST44890
		4490	LH WKO,PSW3		MST44900
		4491	ELSE		MST44910
		4493	ENDC		MST44930
31EC	9586	4494	EPSR WK2,WK0	ENABLE INTERRUPTS	MST44940
31EE	CF00 0004	4495	SLHA R0,4	INCREASE FOR PRECISION	MST44950
31F2	4120 34D0	4496	ITML.1 BAL R2,SMALTIME		MST44960
31FE	2202	4497	BS ITML.1	TIMEOUT GIVES ERROR TTCC40	MST44970
		4499	* ROUTINE FILLS WRITE-BUFFER WITH SPIRAL DATA		MST44990
		4500	*		MST45000
31F8	4800 1964	4501	SPIFILL LDA R0,SIZE	EYTE CCLNT	MST45010
31FC	2701	4502	SIS R0,1		MST45020
31FE	2410	4503	LIS R1,0		MST45030
3200	4820 196C	4504	SPIF.1 LDA R2,WTFADR	GET WRITE BUFFER PCINTER	MST45040
3204	CA21	4505	AAR R2,R1		MST45050
3206	4012 0000	4506	STH R1,0(R2)		MST45060
320A	2612	4507	AIS R1,2		MST45070
320C	0501	4508	CLAR R0,R1	ALL DONE ?	MST45080

## TEST SEQUENCE SUPPORT ROUTINES

320E	028F	4509	BLR	R15	RETURN	MST45090
3210	2208	4510	BS	SPIF.1		MST45100
		4512	* ROUTINE FILLS WRITE-BUFFER WITH WCRST-CASE DATA			MST45120
		4513	*			MST45130
3212	4810 1964	4514	WCASFILL	LDA R1,SIZE	EYTE CCLNT	MST45140
3216	4800 17DC	4515		LH R0,DATA+E	WCRST-CASE DATA	MST45150
321A	4820 196C	4516	WCAS.1	LDA R2,WTFADR	GET WRITE EUFFER PCINTER	MST45160
321E	0A21	4517		AAR R2,R1		MST45170
3220	4002 FFFF	4518		STH R0,-1(R2)		MST45180
3224	2712	4519		SIS R1,2		MST45190
3226	2216	4520		BNMS WCAS.1		MST45200
3228	030F	4521		BR R15	RETURN.	MST45210
		4523	* ROUTINE FILLS WRITE-BUFFER WITH RANCOM DATA			MST45230
		4524	*			MST45240
322A	40F0 1984	4525	RANCFILL	STA R15,TEMPA		MST45250
322E	4810 1964	4526		LDA R1,SIZE	EYTE COUNT	MST45260
3232	41F0 36FE	4527	RAND.1	BAL R15,RAND	GET A 'RANDOM' NUMBER	MST45270
3236	4820 196C	4528		LDA R2,WTFADR	GET WRITE BUFFER PCINTER	MST45280
323A	0A21	4529		AAR R2,R1		MST45290
323C	4062 FFFF	4530		STH WKO,-1(R2)		MST45300
3240	2712	4531		SIS R1,2		MST45310
3242	2218	4532		BNMS RANC.1		MST45320
3244	48F0 1984	4533		LDA R15,TEMPA		MST45330
3248	030F	4534		BR R15	RETURN.	MST45340
		4536	* ROUTINE FILLS READ BUFFER WITH ZEROS BEFORE READ ATTEMPT			MST45360
		4537	*			MST45370
324A	2400	4538	ZERCFILL	LIS R0,0		MST45380
324C	4810 196A	4539		LDA R1,RDFADR	GET REAC EUFFER ADDRESS	MST45390
3250	0821	4540		LDAR R2,R1		MST45400
3252	4A20 1964	4541		AA R2,SIZE	GET END ADDRESS	MST45410
3256	2721	4542		SIS R2,1		MST45420
3258	4001 0000	4543	ZERF.1	STH R0,0(R1)		MST45430
325C	2612	4544		AIS R1,2		MST45440
325E	0521	4545		CLAR R2,R1		MST45450
3260	028F	4546		BLR R15	RETURN	MST45460
3262	2205	4547		BS ZERF.1		MST45470
		4549	* DATA TEST ROUTINE			MST45490
		4550	* BAL RETN,TDATA			MST45500
		4551	* INPUT MEMCRY LOCATIONS:			MST45510
		4552	* OUTBUF = WRITTEN DATA			MST45520
		4553	* INBUF = READ DATA			MST45530

TEST SEQUENCE SUPPORT ROUTINES

		4554	*	SIZE = BUFFER BYTE COUNT		MST45540
		4555	*			MST45550
3264	26F2	4556	TDATA	AIS RETN,2	ENTER HERE FOR BUFFER OFFSET	MST45560
326E	D000 3E80	4557		STM R0,INTSAV		MST45570
326A	4840 196C	4558		LDA R4,WTFADR		MST45580
326E	4A4F FFFE	4559		AH R4,-2(RETN)	ADD OFFSET FOR READ BUFFER DATA	MST45590
3272	2305	4560		BS TDA.0		MST45600
		4561	*			MST45610
3274	D000 3E80	4562	TDATA	STM R0,INTSAV		MST45620
327E	4840 196C	4563		LDA R4,WTFADR		MST45630
327C	4830 196A	4564	TDA.0	LDA R3,RDFADR		MST45640
3280	C8C0 0080	4565		LHI OPKEY,X'80'		MST45650
3284	40C0 1936	4566		STH OPKEY,OPCODE	=TESTING DATA READ	MST45660
328E	2460	4567		LIS R6,0	START CCUNT	MST45670
328A	2472	4568		LIS R7,2	INCREMENT	MST45680
328C	4880 1964	4569		LDA R8,SIZE	END COUNT	MST45690
3290	2781	4570		SIS R8,1	SET TO HALFWORD BOUNDARY	MST45700
3292	4854 0000	4571	TDA.1	LH R5,0(R4)	EXPECTED DATA	MST45710
329E	4553 0000	4572		CLH R5,0(R3)	ACTUAL DATA	MST45720
329A	2138	4573		BNES TDA.2	BRANCH: AS EXPECTED.	MST45730
329C	2632	4574		AIS R3,2		MST45740
329E	2642	4575		AIS R4,2		MST45750
32A0	C160 3292	4576		BXLE R6,TDA.1	CONTINUE...	MST45760
32A4	D100 3E80	4577		LH R0,INTSAV		MST45770
32A8	030F	4578		ER RETN	RETURN TO CALLER	MST45780
		4579	*			MST45790
32AA	4050 193A	4580	TDA.2	STH R5,EDATA	FOR PRINTOUT	MST45800
32AE	4853 0000	4581		LH R5,0(R3)	LOAD ACTUAL DATA	MST45810
32B2	4050 193C	4582		STH R5,RDATA	FOR PRINTOUT	MST45820
32BE	4B30 196A	4583		SA R3,RDFADR	CONVERT LOCATION TO BYTE COUNT	MST45830
32BA	4030 1968	4584		STA R3,ECOUNT	SAVE BYTE COUNT, ALSO	MST45840
32BE	D100 3E80	4585		LH R0,INTSAV		MST45850
32C2	48F0 197E	4586		LDA R15,RWSAVE	CALLER'S LOCATION	MST45860
32C6	E17F FFFC	4587		SVC 7,-4(R15)	LOG ERROR MESSAGE	MST45870
		4588	*		(NO RETURN)	MST45880
		4590	*	READ/WRITE ROUTINE		MST45900
		4591	*	BAL RETN,READ		MST45910
		4592	*	CR		MST45920
		4593	*	BAL RETN,WRIT		MST45930
		4594	*			MST45940
		4595	*	BUT IF EXPECTING ERRORS:		MST45950
		4596	*	BAL RETN,READX		MST45960
		4597	*	CR		MST45970
		4598	*	BAL RETN,WRITX		MST45980
		4599	*	WHICH DOES NOT CHANGE "ERRFLG" OR "CPKEY"		MST45990
		4600	*	INPUT REGISTERS:		MST46000
		4601	*	FUT = DRIVE ADDRESS		MST46010
		4602	*	TRACK = CYLINDER ADDRESS		MST46020
		4603	*	SLAD = SELCH ADDRESS		MST46030
		4604	*	CCAD = CONTRCLLER ADDRESS		MST46040

## TEST SEQUENCE SUPPORT ROUTINES

		4605	*	MEMORY LOCATIONS:		MST46050
		4606	*	WCMD = WRITE/READ CONTRCLLR COMPMDS		MST46060
		4607	*	HEAD = HEAD ADDRESS		MST46070
		4608	*	INBUF = READ BUFFER		MST46080
		4609	*	CUTBLF = WRITE BUFFER		MST46090
		4610	*	REGISTERS DESTROYED: R0,R6,WK0,WK1,WK2,WK3,OPKEY,STAT,RETN2		MST46100
		4611	*			MST46110
32CA	C800 3DCA	4612	READ	LDAI R0,PBLK23	TEST CTRLR STATUS = X'02' (READ)	MST46120
32CE	4000 1982	4613		STA R0,ERRFLG		MST46130
32D2	C8C0 0070	4614		LHI OPKEY,X'70'		MST46140
32D6	40C0 1936	4615		STH OPKEY,CPCODE	=PERFORMING NO-ERROR READ	MST46150
32DA	40F0 1976	4616	READX	STA R15,RWSAVE		MST46160
32DE	41F0 324A	4617		BAL R15,ZERCFILL	MAKE VIRGIN READ BUFFER	MST46170
32E2	D370 1901	4618		LB WK1,RCMD	GET READ COMMAND	MST46180
32E6	C880 0030	4619		LHI WK2,X'30'	SELCH COMMAND	MST46190
32EA	230F	4620		BS RWCOM	ENTER COMMON PROCESS	MST46200
		4621	*			MST46210
32EC	C800 3DB6	4622	WRIT	LDAI R0,PBLK16	TEST CTRLR STATUS = X'02' (WRITE)	MST46220
32F0	4000 1982	4623		STA R0,ERRFLG		MST46230
32F4	C8C0 0060	4624		LHI OPKEY,X'60'		MST46240
32F8	40C0 1936	4625		STH OPKEY,OPCODE	=PERFORMING NO-ERRCR WRITE	MST46250
32FC	40F0 1976	4626	WRITX	STA R15,RWSAVE		MST46260
3300	D370 1900	4627		LB WK1,WCMD	WRITE COMMAND	MST46270
3304	C880 0010	4628		LHI WK2,X'10'	SELCH COMMAND	MST46280
3308	4070 1934	4629	RWCOM	STH WK1,RWOCMD	CONTRCLLR COMPMND USED	MST46290
330C	C280 1911	4630		STB WK2,SLCHCMD	SELCH COMPMND USED	MST46300
3310	2400	4631		LIS R0,0		MST46310
3312	4000 1922	4632		STH R0,RDR	RESET 'READ-RETRIED' INDICATOR	MST46320
		4633	*			MST46330
3316	41F0 385A	4634	RDAGN	BAL R15,SLCH	SET UP SELCH	MST46340
331A	41F0 3412	4635		BAL R15,SETHEAD	SET HEAD NUMBER IN DRIVE	MST46350
331E	41F0 3426	4636		BAL R15,SETOFF	SET HEAD/STROBE OFFSET IN DRIVE	MST46360
3322	41F0 3502	4637		BAL R15,CHECR	WRITE HEADER TO CONTROLLER	MST46370
3326	4800 1934	4638	ERASX	LH R0,RWOCMD	CONTROLLER OUTPUT COMMAND:	MST46380
332A	C400 0006	4639		NHI R0,X'06'	WRITE, FORMAT BITS -	MST46390
332E	C500 0006	4640		CLHI R0,X'06'	WRITING IN FORMAT MODE ?	MST46400
3332	2133	4641		BNES FMTSAFE	BRANCH: NO.	MST46410
3334	4000 1926	4642		STH R0,RFMTFLG	YES. SET FLAG.	MST46420
3338	DE30 1935	4643	FMTSAFE	OC DCAD,RWOCMD+1	START CONTROLLER	MST46430
333C	DE40 1911	4644		OC SLAD,SLCHCMD	START SELCH	MST46440
3340	41E0 346E	4645		BAL R14,SWAIT	WAIT FOR SELCH & CTRLR IDLE	MST46450
3344	0200	4646		DCX 0200	TIMEOUT CONSTANT	MST46460
3346	9B50	4647		RDR FUT,R0	READ RPS COUNT FROM DRIVE & IDLE	MST46470
3348	4000 194E	4648		STH R0,RPSCNT		MST46480
334C	E110 3D72	4649		SVC 1,PBLK01	TEST SELCH IS IDLE.	MST46490
3350	4810 1982	4650		LDA R1,ERRFLG		MST46500
3354	C510 FFFF	4651		CLHI R1,-1	UNCONDITIONAL RETURN ?	MST46510
3358	4330 33AA	4652		BE SPL.RTN	BRANCH: YES.	MST46520
335C	E121 0000	4653		SVC 2,0(R1)	PERFORM SPECIFIED TEST	MST46530
3360	2306	4654		BS DXTL.2R	(EXECUTED IF NO ERROR)	MST46540
3362	D3A0 164A	4655	DXTL.1	LB STAT,ERRSTA	STATUS ON ERRCR:	MST46550
3366	41F0 3172	4656		BAL R15,STCHK	TEST IF WRITE-PROTECT PRESENT.	MST46560
336A	336C	4657		DAC DXTL.2R	NOT-WRITE-PROTECT PATH	MST46570

## TEST SEQUENCE SUPPORT ROUTINES

		4658	*						MST46580
336C	4810	1982		4659	DXTL.2R	LDA	R1,ERRFLG	RELOAD PBLKNN ADDRESS	MST46590
3370	C510	3DCA		4660		CLAI	R1,PBLK23	NC-ERROR READ ?	MST46600
3374	4230	339C		4661		BNE	RW.RTN	BRANCH: NC AUTO-RETRY.	MST46610
3378	4800	1928		4662		LH	R0,ERRFLG1	WAS ERROR DETECTED, THIS READ ?	MST46620
337C	2137			4663		BNZS	DXTL.4R	BRANCH: YES.	MST46630
337E	4800	1922		4664		LH	R0,RDER	IS THIS 2ND READ ?	MST46640
3382	233D			4665		BZS	RW.RTN	BRANCH: NO ERRORS, 1ST READ.	MST46650
3384	E150	1B50		4666		SVC	5,MSG23	'SCFT READ ERROR'	MST46660
3388	230A			4667		BS	RW.RTN		MST46670
338A	4800	1922		4668	DXTL.4R	LH	R0,RDER	SECOND ERROR ?	MST46680
338E	2135			4669		BNZS	DXTL.5R	BRANCH: YES.	MST46690
3390	4050	1922		4670		STH	FUT,RDER	SET '1ST ERROR' FLAG	MST46700
3394	4300	3316		4671		B	RDAGN	RETRY READ.	MST46710
3398	E150	1B40		4672	DXTL.5R	SVC	5,MSG22	'HARD READ ERROR'	MST46720
339C	C8C0	0013		4673	RW.RTN	LHI	OPKEY,X'13'	'=RELEASE' COMMAND TO DRIVE	MST46730
33A0	CE50	1906		4674		OC	FUT,RELEASE		MST46740
33A4	41E0	3456		4675		BAL	R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST46750
33A8	000F			4676		DCX	000F		MST46760
33AA	41E0	3818		4677	SPL.RTN	BAL	R14,SLCHK	TEST SELCH FINAL ADDRESS	MST46770
33AE	48F0	1976		4678		LDA	RETN,RWSAVE		MST46780
33B2	030F			4679		BR	RETN	RETURN	MST46790
				4681	*			CHECKS IF THE DISC IS A CE PACK, AND IF SO	MST46810
				4682	*			IS THE CURRENT CYLINDER VOID ?	MST46820
				4683	*	BAL	RETN,ILLADD		MST46830
				4684	*			RETN2 = VOID RETURN	MST46840
				4685	*			INPUT MEMORY LOCATIONS: PACTYP = CE OR USER PACK IDENTIFIER	MST46850
				4686	*			REGISTERS DESTROYED: R0,R14	MST46860
				4687	*				MST46870
33B4	26F1			4688	ILLADC	AIS	R15,ADC-1		MST46880
33B6	C4F0	FFFE		4689		NHI	R15,0-ADC		MST46890
33BA	48EF	0000		4690		LDA	R14,0(R15)	EYPASS ADDRESS	MST46900
33BE	26F2			4691		AIS	R15,ADC	RETURN ADDRESS	MST46910
33C0	C800	00CE		4692		LHI	R0,X'CE'	CE DISC PACK?	MST46920
33C4	C400	177C		4693		CLB	R0,PACTYP+E		MST46930
33C8	023F			4694		BNER	RETN	NC - NORMAL RETURN	MST46940
33CA	C5B0	0046		4695		CLHI	TRACK,70	< 70	MST46950
33CE	028F			4696		ELR	RETN	OK	MST46960
33D0	C5B0	004C		4697		CLHI	TRACK,76	70-75	MST46970
33D4	028E			4698		BLR	RETN2	REJECT	MST46980
33D6	C5B0	0073		4699		CLHI	TRACK,115	76-114	MST46990
33DA	028F			4700		BLR	RETN	OK	MST47000
33DC	C5B0	0079		4701		CLHI	TRACK,121	115-120	MST47010
33E0	028E			4702		BLR	RETN2	REJECT	MST47020
33E2	C5B0	008C		4703		CLHI	TRACK,140	121-139	MST47030
33E6	028F			4704		BLR	RETN	OK	MST47040
33E8	C5B0	0097		4705		CLHI	TRACK,151	140-150	MST47050
33EC	028E			4706		BLR	RETN2	REJECT	MST47060
33EE	C5B0	00E6		4707		CLHI	TRACK,230	151-229	MST47070
33F2	028F			4708		BLR	RETN	OK	MST47080

TEST SEQUENCE SUPPORT ROUTINES

33F4	C5B0 00F1	4709	CLHI TRACK,241	23C-240	MST47090
33F8	028E	4710	BLR RETN2	REJECT	MST47100
33FA	030F	4711	BR RETN	>240	MST47110
		4713	* TO WRITE CYLINDER ADDRESS TO DRIVE, SET CYLINDER		MST47130
		4714	* CALLING SEQUENCE: BAL R15,SETCYL		MST47140
		4715	*		MST47150
		4716	(TRACK) = CYLINDER ACRS		MST47160
33FC	40B0 194C	4717	SETCYL STH TRACK,CURCYL	CURRENT CYLINDER NUMBER	MST47170
340C	C8C0 0010	4718	LHI OPKEY,X*10*	=SET CYLINDER OPERATION	MST47180
3404	585B	4719	WHR FLT,TRACK	CYL ACRS TO DRIVE	MST47190
3406	DE50 1902	4720	OC FUT,CYLCMD	SET CYL # TO DRIVE	MST47200
340A	41E0 3456	4721	BAL R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST47210
340E	000F	4722	DCX 000F		MST47220
3410	030F	4723	BR R15	RETURN	MST47230
		4725	* TO WRITE HEAD ADDRESS TO DRIVE, SET HEAD		MST47250
		4726	* CALLING SEQUENCE: BAL R15,SETHEAD		MST47260
		4727	*		MST47270
		4728	(HEAD) CONTAINS HEAD ADDRESS		MST47280
3412	C8C0 0011	4729	SETHEAD LHI OPKEY,X*11*	=SET HEAD OPERATION	MST47290
3416	D850 194A	4730	WH FUT,HEAD	HEAD ACRS TO DRIVE	MST47300
341A	DE50 1903	4731	CC FUT,HECCMD	SET HEAD # TO DRIVE	MST47310
341E	41E0 3456	4732	BAL R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST47320
3422	000F	4733	DCX 000F		MST47330
3424	030F	4734	BR R15		MST47340
		4736	* ROUTINE ESTABLISHES SERVO OFFSET BEFORE TRANSFER ATTEMPT		MST47360
		4737	*		MST47370
3426	D300 1904	4738	SETOFF LB R0,OFFCMD	GET HEAD/STRCBE OFFSET COMMAND	MST47380
342A	0800	4739	LDAR R0,R0	ZERO (NULL) COMMAND ?	MST47390
342C	033F	4740	BZR R15	BRANCH: YES.	MST47400
342E	C8C0 0040	4741	LHI OPKEY,X*40*	=SERVO/STRCBE OFFSETS	MST47410
3432	9E50	4742	CCR FUT,R0	SEND OFFSET COMMAND.	MST47420
3434	41E0 3496	4743	BAL R14,DWAIT	WAIT FOR DRIVE READY	MST47430
3438	00FF	4744	DCX 00FF		MST47440
343A	030F	4745	BR R15	RETURN TO CALLER	MST47450
		4747	* FILE READY TO SEEK/READ/WRITE SUBROUTINE		MST47470
		4748	* CALLING SEQUENCE: BAL RETN,FRSSR		MST47480
		4749	* RETURN WHEN CONTROLLER IDLE & DRIVE READY.		MST47490
		4750	*		MST47500
343C	E110 3D72	4751	FRSSR1 SVC 1,PBLK01	SELCH SHOULDN'T BE BUSY HERE	MST47510
3440	41E0 3456	4752	BAL R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST47520
3444	000F	4753	DCX 000F		MST47530



TEST SEQUENCE SUPPORT ROUTINES

344E	E130	3D7A	4754	SVC	3,PBLK03	ALTCAN ACT BUSY.	MST47540
344A	E130	3DAE	4755	SVC	3,PBLK13	TEST DRIVE STATUS	MST47550
344E	41E0	3496	475E	EAL	R14,DWAIT	WAIT FOR DRIVE READY	MST475E0
3452	06D6		4757	DCX	06D6		MST47570
3454	030F		4758	BR	RETN	RETURN	MST47580

4760 \* ROUTINE WAITS FOR 'CONTROLLER IDLE' MST47600

			4761	*			MST47610
345E	480E	0000	4762	CWAIT	LH R0,0(R14)	LCAD TIMEOUT VALUE	MST47620
345A	CF00	0004	4763		SLHA R0,4	INCREASE FOR PRECISION	MST47630
345E	26E2		4764		AIS R14,2		MST47640
3460	4030	1648	4765		STH DCAD,ERRDEV	FCR ERROR PRINTOUT	MST47650
3464	9D3A		476E	CWA.1	SSR DCAD,STAT	CONTROLLER GOING IDLE ?	MST476E0
346E	027E		4767		BTCR 7,R14	BRANCH: YES.	MST47670
346E	4120	34D0	4768		EAL R2,SMALTIME	TEST TIMEOUT	MST47680
346C	2204		4769		BS CWA.1		MST47690

4771 \* ROUTINE WAITS FOR 'SELCH IDLE' MST47710

			4772	*			MST47720
346E	480E	0000	4773	SWAIT	LH R0,0(R14)	LCAD TIMECLT VALUE	MST47730
3472	CF00	0004	4774		SLHA R0,4	INCREASE FOR PRECISION	MST47740
347E	26E2		4775		AIS R14,2		MST47750
347E	4040	1648	477E		STH SLAD,ERRDEV	FCR ERRCR PRINTOUT	MST477E0
347C	9D4A		4777	SWA.1	SSR SLAD,STAT	SELCH IDLE ?	MST47770
347E	2388		4778		BFFS 8,SWA.2	BRANCH: YES.	MST47780
3480	4120	34D0	4779		EAL R2,SMALTIME	TEST TIMEOUT	MST47790
3484	9D4A		4780		SSR SLAD,STAT		MST47800
348E	2384		4781		BFFS 8,SWA.2	(FCR CRITICAL TIMING)	MST47810
348E	4120	38B2	4782		BAL R2,BACKGRND	DC BACKGRCOND TESTING	MST47820
348C	2208		4783		ES SWA.1		MST47830
348E			4784		IFZ ADC-2		MST47840
348E	CE40	19D0	4785	SWA.2	CC SLAD,STOP	STCP SELCH	MST47850
			478E		ELSE		MST478E0
			4788		ENDC		MST47880
3492	4300	3464	4789		P CWA.1	WAIT FOR CTRLR IDLE...	MST47890

4791 \* ROUTINE WAITS FOR 'DRIVE READY' MST47910

			4792	*			MST47920
349E	480E	0000	4793	DWAIT	LH R0,0(R14)	LCAD TIMEOUT VALUE	MST47930
349A	CF00	0004	4794		SLHA R0,4	INCREASE FOR PRECISICN	MST47940
349E	26E2		4795		AIS R14,2	ADVANCE PAST PARAMETER-	MST47950
34A0	4050	1648	4796		STH FLT,ERRDEV	FOR ERROR PRINTCUT	MST47960
34A4	9D5A		4797	DWA.1	SSR FUT,STAT	DRIVE READY ?	MST47970
34A6	08AA		4798		LDAR STAT,STAT		MST47980
34A8	033E		4799		BZR R14	BRANCH: DRIVE READY.	MST47990
34AA	C3A0	00F7	4800		THI STAT,X'F7'		MST48000
34AE	2134		4801		BNZS DWA.2	BRANCH: BAD DRIVE STATUS.	MST48010

## TEST SEQUENCE SUPPORT ROUTINES

34B0	4120 34D0	4802	BAL	R2,SMALTIME	TEST TIMEOUT	MST48020
34B4	2208	4803	BS	DWA.1		MST48030
34B6	D2A0 164A	4804	DWA.2	STB	STAT,ERRSTA	MST48040
34BA	E100 3DD6	4805		SVC	0,PBLK30	MST48050
		4806	*		TESTS DRIVE STATUS = X'08'	MST48060
					(NO RETURN)	
		4808	*			MST48080
		4809	*	ONE-MILLISECOND COUNTDOWN TIMER		MST48090
		4810	*	CALL SEQUENCE: LHI WK1,TIMEOUTVALUE		MST48100
		4811	*	BAL R14,MILSEC		MST48110
		4812	*			MST48120
34BE	2771	4813	MILSEC	SIS WK1,1		MST48130
34C0	2313	4814		BNMS MILS1	NO TIME-OUT, YET	MST48140
34C2	E14E FFFC	4815		SVC 4,-4(R14)	TIMEOUT; LOG MESSAGE.	MST48150
34C6	2401	4816	MILS1	LIS R0,1	FOR 1-MS DELAY	MST48160
34C8	41F0 10BA	4817		BAL R15,TIMER	ONE-MILLISECOND DELAY	MST48170
34CC	030E	4818		BR R14		MST48180
		4820	*	ROUTINE CHECKS TIMEOUTS IN SUB-MILLISECOND INTERVALS		MST48200
		4821	*			MST48210
34D0		4822		ALIGN 4		MST48220
34D0	4810 0A1C	4823	SMALTIME	LH R1,TIME		MST48230
34D4	9014	4824		SRLS R1,4	DECREASE FOR PRECISION	MST48240
34D6	2711	4825	SMAL.1	SIS R1,1		MST48250
34D8	2021	4826		BPS SMAL.1		MST48260
34DA	2701	4827		SIS R0,1	TIMEOUT ?	MST48270
34DC	0312	4828		BNMR R2	BRANCH:NOT YET.	MST48280
34DE	40C0 1936	4829		STH OPKEY,CPCODE	SET FOR ERROR MESSAGE -	MST48290
34E2	E14F FFFC	4830		SVC 4,-4(R15)	TIMEOUT ERROR	MST48300
		4831	*		(NO RETURN)	MST48310
		4833	*	ROUTINE SETS UP SECTOR HEADER FOR ONE SECTOR		MST48330
		4834	*			MST48340
34E6	4800 194A	4835	HEADER	LH R0,HEAD		MST48350
34EA	910A	4836		SLLS R0,10	FORMAT HEADER BYTES	MST48360
34EC	0608	4837		OAR R0,TRACK		MST48370
34EE	9400	4838		EXBR R0,R0		MST48380
34F0	4810 196C	4839		LDA R1,WTFADR		MST48390
34F4	D2D1 0000	4840		STB SECT,0(R1)	HEADER BYTE 0	MST48400
34F8	D2D1 0001	4841		STB R0,1(R1)	HEADER BYTE 1	MST48410
34FC	D2B1 0002	4842		STB TRACK,2(R1)	HEADER BYTE 2	MST48420
3500	030F	4843		BR R15	RETURN	MST48430
		4845	*	ROUTINE WRITES HEADER INFORMATION TO DISC CONTROLLER,		MST48450
		4846	*	HEAD ADDRESS TO DRIVE		MST48460

## TEST SEQUENCE SUPPORT ROUTINES

		4847	*				MST48470
3502	4800 194A	4848	CHECR	LH	RO,HEAD		MST48480
350E	910A	4849		SLLS	RO,10		MST48490
3508	060B	4850		OAR	RO,TRACK		MST48500
350A	9A3D	4851		WDR	DCAD,SECT		MST48510
350C	5830	4852		WHR	DCAD,RO		MST48520
350E	4000 1946	4853		STH	SECT,CURSECT	CURRENT SECTOR NUMBER	MST48530
3512	C850 194A	4854		WH	FUT,HEAD	HEAD NUMBER REGISTER,MULTI-DRIVE	MST48540
3516	030F	4855		BR	R15	RETURN	MST48550
		4857	*	ROUTINE CAUSES ADDRESS MARK FOR SPECIFIED SECTOR TO BE ERASED.			MST48570
		4858	*				MST48580
3518	40F0 1976	4859	ERANK	STA	R15,RWSAVE		MST48590
351C	C800 0010	4860		LHI	RO,X'10'	SELCH GO-WRITE	MST48600
3520	C200 1911	4861		STB	RO,SLCHCMD		MST48610
3524	41F0 385A	4862		BAL	R15,SLCH	SEND SELCH ADDRESSES	MST48620
3528	41F0 3412	4863		BAL	R15,SETHD	SET HEAD TO DRIVE	MST48630
352C	C8C0 0064	4864		LHI	OPKEY,X'64'	=ERASING ADDRESS MARK	MST48640
3530	40C0 1936	4865		STH	OPKEY,OPCODE		MST48650
3534	2406	4866		LIS	RO,X'0006'	FORMAT WRITE COMMAND	MST48660
353E	4000 1934	4867		STH	RO,RWOCMD		MST48670
353A	C800 30D2	4868		LDAI	RO,PBLK2E		MST48680
353E	4000 1982	4869		STA	RO,ERRFLG	TO TEST CTRLR STATUS = X'CA'	MST48690
3542	41F0 34E6	4870		BAL	R15,HEADER		MST48700
354E	2501	4871		LCS	RO,1		MST48710
3548	4701 0000	4872		XH	RO,0(R1)		MST48720
354C	4001 0000	4873		STH	RO,0(R1)	ENSURE NO LATER SECTOR MATCH	MST48730
3550	080D	4874	ERANK.1	LDAR	RO,SECT		MST48740
3552	C600 0080	4875		CHI	RO,X'80'		MST48750
3556	9A30	4876		WDR	DCAD,RO	SEND 'ERASE AA' DIRECTIVE	MST48760
3558	4800 194A	4877		LH	RO,HEAD		MST48770
355C	910A	4878		SLLS	RO,10		MST48780
355E	060B	4879		OAR	RO,TRACK		MST48790
3560	9830	4880		WHR	DCAD,RO		MST48800
3562	40D0 1946	4881		STH	SECT,CURSECT		MST48810
3566	C850 194A	4882		WH	FUT,HEAD	FOR MULTI-DRIVE ACTIVITY	MST48820
356A	4300 3326	4883		B	ERASX	GO TO COMMON READ/WRITE ROUTINE.	MST48830
		4884	*			RETURNS ON R15 VIA (RWSAVE)	MST48840
		4886	*	ROUTINE SETS UP TRANSFER SIZE, BASED ON 'SECNUM' OPTION			MST48860
		4887	*				MST48870
356E	C820 0114	4888	XFERSIZP	LHI	R2,PRECL	FOR FORMAT MODE	MST48880
3572	2303	4889		BS	XFS.0		MST48890
		4890	*				MST48900
3574	C820 0100	4891	XFERSIZL	LHI	R2,LRECL	FOR NORMAL MODE	MST48910
3578	4810 180C	4892	XFS.0	LH	R1,SECNUM*6		MST48920
357C	2400	4893		LIS	RO,0		MST48930
357E	0A02	4894	XFS.1	AAR	RO,R2		MST48940
3580	4280 10B0	4895		BC	ERROR12	(16 BIT) MEMORY LIM EXCEEDED	MST48950

## TEST SEQUENCE SUPPORT ROUTINES

3584	2711	4896	SIS	R1,1		MST48960
3586	2214	4897	BNMS	XFS.1		MST48970
3588	2701	4898	SIS	R0,1		MST48980
358A	4000 1964	4899	STA	R0,SIZE		MST48990
358E	030F	4900	BR	R15	RETURN	MST49000
		4902	* ROUTINE FLAGS SECTOR DEFECTIVE, THEN TESTS THE FLAG.			MST49020
		4903	*			MST49030
3590	40E0 1978	4904	FLAGIT	STA R14,FLGRTN		MST49040
3594	C800 0080	4905	LHI	R0,X*80*(SECT)	DEF SEC BIT	MST49050
3598	4810 196C	4906	LCA	R1,WTFADR		MST49060
359C	E201 0000	4907	STB	R0,0(R1)		MST49070
35A0	41F0 32EC	4908	BAL	RETN,WRIT	WRITE WITH DEF SEC FLAG SET	MST49080
35A4	C8E0 10FE	4909	LDAI	R14,HEXASC		MST49090
35A8	0818	4910	LDAR	R1,TRACK		MST49100
35AA	2403	4911	LIS	R0,3		MST49110
35AC	C820 1A2E	4912	LDAI	R2,MSG05+16		MST49120
35B0	01FE	4913	BALR	R15,R14	BUILD FLAG MESSAGE...	MST49130
35B2	4810 194A	4914	LH	R1,HEAD		MST49140
35B6	2402	4915	LIS	R0,2		MST49150
35B8	C820 1A32	4916	LDAI	R2,MSG05+20		MST49160
35BC	01FE	4917	BALR	R15,R14		MST49170
35B8	0810	4918	LDAR	R1,SECT		MST49180
35C0	C820 1A35	4919	LDAI	R2,MSG05+23		MST49190
35C4	01FE	4920	BALR	R15,R14		MST49200
35C6	E150 1A1E	4921	SVC	5,MSG05	'DEF SEC FLAGGED...'	MST49210
		4922	*			MST49220
35CA	2401	4923	LIS	R0,X*0001*	NCRNAL READ COMMAND, ONLY.	MST49230
35CC	4000 1900	4924	STH	R0,WCMD		MST49240
35D0	C8C0 0093	4925	LHI	OPKEY,X*93*	=TESTING FOR CTRLR ERROR STATUS	MST49250
35D4	40C0 1936	4926	STH	OPKEY,OPCODE	(DEFECTIVE SECTOR)	MST49260
35D8	C800 3DCE	4927	LDAI	R0,PBLK25	TC TEST CTRL STATUS = X*2E*	MST49270
35DC	4000 1982	4928	STA	R0,ERRFLG		MST49280
35E0	41F0 32DA	4929	BAL	RETN,READX	TEST SECTOR FLAG	MST49290
35E4	2303	4930	BS	FLAG.1	(EXECUTED ON NO ERROR)	MST49300
35E6	E150 1A38	4931	FLAG.0	SVC 5,MSG06	'FLAG REJECTED'	MST49310
35EA	48E0 1978	4932	FLAG.1	LDA R14,FLGRTN		MST49320
35EE	030E	4933	BR	R14	RETURN	MST49330
		4935	* SEEK SUBROUTINE			MST49350
		4936	* BAL	RETN,SKSR	DESIRED CYL ADS IN "TRACK"	MST49360
		4937	* INPUT REGISTERS:			MST49370
		4938	* TRACK	= CYLINDER ADDRESS		MST49380
		4939	* FUT	= DRIVE ADDRESS		MST49390
		4940	* DCAD	= CONTROLLER ADDRESS		MST49400
		4941	*			MST49410
35F0	40F0 197A	4942	SKSR	STA RETN,SKRTN	SAVE RETURN	MST49420
35F4	41F0 33FC	4943	BAL	R15,SETCYL	WRITE CYL ADRS TC DRIVE	MST49430
35F8	C8C0 0020	4944	LHI	OPKEY,X*20*		MST49440

TEST SEQUENCE SUPPORT ROUTINES

35FC	40C0 1936	4945	STH	OPKEY,OPCODE	=SEEK OPERATICN	MST49450
3600	CE50 1909	4946	OC	FUT,SEEKC	SEEK CMD TO DRIVE	MST49460
3604	41F0 343C	4947	BAL	RETN,FRSSR1	RETURN WHEN CRIVE READY	MST49470
3608	E130 3D7E	4948	SVC	3,PBLK04	TEST DRIVE STATUS = X*00*	MST49480
360C	48F0 197A	4949	LDA	RETN,SKRTN		MST49490
3610	030F	4950	BR	RETN	RETURN	MST49500
		4952		* ROUTINE SEEKS (LOCYL), SETS UP REGISTER SECT AND LOCATION HEAD FROM		MST49520
		4953		* THE SPECIFIED (SECTOR) OPTION.		MST49530
		4954		* CALLING SEQUENCE: BAL WK3,TSECT OR BAL WK3,TSECTA		MST49540
		4955		* REGISTERS DESTROYED: WK0,R14,WK1,R0		MST49550
		4956		*		MST49560
3612	48B0 1758	4957	TSECT	LH TRACK,LOCYL+6		MST49570
3616	41F0 33B4	4958	BAL	R15,ILLADD	TEST CE PACK VCID AREAS	MST49580
361A	1DA8	4959	CAC	ERROR11		MST49590
361C	41F0 35F0	4960	BAL	RETN,SKSR	SEEK LOCYL	MST49600
3620	4860 1770	4961	TSECTA	LH WK0,SECTOR+6	(HEAD:SECTOR)	MST49610
3624	5306	4962	LBR	SECT,WK0	GET SECTOR	MST49620
362E	4800 1924	4963	LH	R0,FLAGS	LOOK AT MODULE FLAGS.	MST49630
362A	5003	4964	SRLS	R0,3	EE SECTORS/TRACK ALLCWED ?	MST49640
362C	2185	4965	BCS	TSECT.1	BRANCH: YES.	MST49650
362E	C5D0 0040	4966	CL-I	SECT,MAXSEC	AC. VALID SECTOR NUMBER ?	MST49660
3632	4380 1D8A	4967	BNL	ERROR5	BRANCH: NO.	MST49670
363E	9068	4968	TSECT.1	SRHLS WK0,8		MST49680
3638	4060 194A	4969	STH	WK0,HEAD	GET HEAD	MST49690
363C	40D0 1946	4970	STH	SECT,CURSECT	CURRENT SECTOR NUMBER	MST49700
364C	0309	4971	BR	WK3	RETURN.	MST49710
		4973		* ROUTINE WRITES (OFFSET-CYLINDER-HEAD-SECTOR) TO DISPLAY PANEL		MST49730
		4974		* REGISTERS DESTROYED: R0,R1		MST49740
		4975		*		MST49750
3642	2411	4976	DISPLAY	LIS R1,1		MST49760
3644	CE10 164D	4977	OC	R1,INCR		MST49770
3648	CA10 1947	4978	WD	R1,CURSECT+1	SECTOR NUMBER	MST49780
364C	DA10 1948	4979	WD	R1,HEAD+1		MST49790
365C	4800 194C	4980	LH	R0,CURCYL		MST49800
3654	5400	4981	EXER	R0,R0		MST49810
365E	9810	4982	WHR	R1,R0		MST49820
3658	CA10 1904	4983	WD	R1,OFFCMD	AND OFFSET COMMAND TO DS	MST49830
365C	CE10 164C	4984	CC	R1,NORM		MST49840
366C	030F	4985	BR	RETN		MST49850
		4987		* RESTORE SUBROUTINE		MST49870
		4988		* BAL RETN,RSTSR		MST49880
		4989		* RETURNS WITH (TRACK) = 0.		MST49890
		4990		*		MST49900
3662	40F0 1974	4991	RESTORE	STA RETN,RSRET	SAVE RETURN	MST49910

## TEST SEQUENCE SUPPORT ROUTINES

3666	E130 3D7A	4992	SVC	3,PBLK03	ALTMAN NOT BUSY	MST49920
366A	C8C0 0030	4993	LHI	OPKEY,X*30*		MST49930
366E	40C0 1936	4994	STH	OPKEY,CPCODE	=RESTORE OPERATION	MST49940
3672	CE50 190A	4995	OC	FUT,RESTCC	RESTORE CMC TO DRIVE	MST49950
367E	41E0 345E	4996	BAL	R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST49960
367A	000F	4997	CCX	000F		MST49970
367C	41E0 3496	4998	BAL	R14,DWAIT	WAIT FOR DRIVE READY	MST49980
368C	06D6	4999	DCX	06D6		MST49990
3682	2480	5000	LIS	TRACK,0	SET CURRENT CYLINDER = 0	MST50000
3684	40B0 194C	5001	STH	TRACK,CURCYL	CURRENT CYLINDER ADDR	MST50010
3688	48F0 1974	5002	LDA	RETN,RSRET		MST50020
368C	C5F0 216E	5003	CLAI	RETN,TST1.4	TESTING SEEK INCOMPLETE ?	MST50030
3690	033F	5004	BER	RETN	BRANCH: YES.	MST50040
3692	E130 3D7E	5005	SVC	3,PBLK04	TEST DRIVE STATUS = X*00*	MST50050
369E	030F	5006	BR	RETN	RETURN.	MST50060
		5008	*	PERFORMS READ CHECK ON CURRENT CYLINDER, HEAD, SECTOR.		MST50080
		5009	*	NO OPERATION IF BYCKAD = 1.		MST50090
		5010	*	INPUT REGISTERS:		MST50100
		5011	*	FUT = DRIVE ADDRESS		MST50110
		5012	*	DCAC = CONTROLLER ADDRESS		MST50120
		5013	*	TRACK = CYLINDER ADDRESS		MST50130
		5014	*	SECT = SECTOR ADDRESS		MST50140
		5015	*	MEMORY LOCATIONS:		MST50150
		5016	*	HEAD = HEAD ADDRESS		MST50160
		5017	*	PACTYP = CE OR USER PACK IDENTIFIER		MST50170
		5018	*	REGISTERS DESTROYED: R0,WK0,WK1,STAT,OPKEY,RET2		MST50180
		5019	*			MST50190
3698	4800 1788	5020	CKADSR	LH R0,BYCKAD*6	BYPASS READ CHECK ?	MST50200
369C	023F	5021		BNZR RETN	BRANCH IF YES.	MST50210
369E	40F0 1976	5022	CKADSRX	STA RETN,RWSAVE		MST50220
36A2	2400	5023		LIS R0,0		MST50230
36A4	4000 1922	5024		STH R0,RDR	RESET READ ERROR INDICATOR	MST50240
36A8	41F0 343C	5025	CKRDX	BAL R15,FRSSR1	RETURN WHEN DRIVE READY	MST50250
36AC	41F0 3412	5026		BAL R15,SETHEAD	WRITE HEAD NUMBER TO DRIVE	MST50260
36B0	41F0 3426	5027		BAL R15,SETOFF	SERVO/STROBE OFFSET TO DRIVE	MST50270
36B4	41F0 3502	5028		BAL R15,CHEDR	WRITE HEADER TO CONTROLLER	MST50280
36B8	C8C0 0050	5029		LHI OPKEY,X*50*		MST50290
36BC	40C0 1936	5030		STH OPKEY,OPCODE	=READ-CHECK OPERATION	MST50300
36C0	D300 1905	5031		LB R0,RCHECK		MST50310
36C4	4000 1934	5032		STH R0,RWOCMD		MST50320
36C8	9E30	5033		OCR DCAD,R0	COMMAND READ-CHECK.	MST50330
36CA	41E0 345E	5034		BAL R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST50340
36CE	0080	5035		DCX 0080		MST50350
36D0	9850	5036		RDR FUT,R0	GET RPS & CTRLR IDLE	MST50360
36D2	4000 194E	5037		STH R0,RPSCNT	AND SAVE.	MST50370
36D6	E120 3DB2	5038		SVC 2,PBLK14	TO ERRCK AFTER ANY ERROR PRINT	MST50380
36DA	4800 1922	5039		LH R0,RDR	DID IT FAIL THE FIRST READ ?	MST50390
36DE	2333	5040		BZS CKTL1	BRANCH: NO.	MST50400
36E0	E150 1B50	5041		SVC 5,MSG23	SOFT READ ERROR	MST50410
36E4	48F0 1976	5042	CKTL1	LDA RETN,RWSAVE		MST50420

## TEST SEQUENCE SUPPORT ROUTINES

36E8	030F	5043	BR	RETN		MST50430
36EA	4800 1922	5045	ERRCK	LH	RO,RDER	MST50450
36EE	2334	5046		BZS	ERRCK1	MST50460
36F0	E150 1840	5047		SVC	S,MSG22	MST50470
36F4	2208	5048		BS	CKTL1	MST50480
36FE	4050 1922	5049	ERRCK1	STH	FUT,RDER	MST50490
36FA	4300 36A8	5050		B	CKRDX	MST50500
		5052	* PSEUDO-RANDOM GENERATOR			MST50520
		5053	* BAL RETN,RAND			MST50530
		5054	* RETURNS RESULT IN WKO			MST50540
		5055	*			MST50550
36FE	4860 192C	5056	RAND	LH	WKO,RND1	MST50560
3702	4870 192E	5057		LH	WK1,RND2	MST50570
3706	4070 192C	5058		STH	WK1,RND1	MST50580
370A	0A67	5059		AAR	WKO,WK1	MST50590
370C	4060 192E	5060		STH	WKO,RND2	MST50600
3710	030F	5061	BR	RETN	RETURN	MST50610
		5063	* ROUTINE ADVANCES TO NEXT VALID SECTOR			MST50630
		5064	*			MST50640
3712	4AD0 180C	5065	NEWSEC	AH	SECT,SECNUM+6	MST50650
3716	26D1	5066		AIS	SECT,1	MST50660
3718	C5D0 0040	5067		CLHI	SECT,MAXSEC	MST50670
371C	4280 3788	5068		BL	CONTINUE	MST50680
3720	26F3	5069	FALLTHRL	AIS	R15,ACC+ACC-1	MST50690
3722	C4F0 FFFE	5070		NHI	R15,0-ADC	MST50700
3726	030F	5071	BR	R15	RETURN	MST50710
		5073	* ROUTINE ADVANCES TO NEXT VALID HEAD			MST50730
		5074	* CALLING SEQUENCE: BAL R15,NEWHEAD / BAL R15,FIRSTHD			MST50740
		5075	DAC (TERMINATION VECTOR)			MST50750
		5076	*			MST50760
3728	4800 194A	5077	NEWHEAD	LH	RO,HEAD	MST50770
372C	4300 3752	5078		B	NEWH.2	MST50780
		5079	*			MST50790
3730	2400	5080	FIRSTHD	LIS	RO,0	MST50800
3732	4000 194A	5081		STH	RO,HEAD	MST50810
3736	C810 193E	5082	NEWH.0	LDAI	R1,HEADSA	MST50820
373A	0860	5083		LCAR	RE,RO	MST50830
373C	C560 0010	5084		CLHI	R6,16	MST50840
3740	2184	5085		BLS	NEWH.1	MST50850
3742	CB60 0010	5086		SHI	R6,16	MST50860
3746	2612	5087		AIS	R1,2	MST50870
3748	41E0 10AC	5088	NEWH.1	BAL	R14,UNARY	MST50880
374C	4431 0000	5089		NH	R3,0(R1)	MST50890

## TEST SEQUENCE SUPPORT ROUTINES

3750	233A		5090	BZS	NEWP.3	BRANCH: NO (SET=YES).	MST50900
3752	2601		5091	NEWH.2	AIS RO,1	TRY NEXT	MST50910
3754	4500 1920		5092		CLH RO,MAXHEAD	STILL VALID ?	MST50920
3758	4280 3736		5093		BL NEWH.0	BRANCH: YES.	MST50930
375C	4830 17A0		5094		LH R3,DISCON+6	RELOAD DEDICATED REGISTER	MST50940
3760	4300 3720		509E		B FALLTHRU	ALL GCNE.	MST509E0
3764	4000 194A		5096	NEWH.3	STH RO,HEAD	NEXT NON-DELETED HEAD	MST509E0
3768	4830 17A0		5097		LH R3,DISCON+6	RELOAD DEDICATED REGISTER	MST50970
376C	4300 3788		5098		B CONTINUE	RETURN TO CALLER	MST50980
			5100	* ROUTINE ADVANCES TO NEXT CYLINDER			MST51000
			5101	*			MST51010
3770	26B1		5102	NEWCYL	AIS TRACK,1		MST51020
3772	4980 1764		5103		CH TRACK,HICYL+6		MST51030
377E	4320 3788		5104		BNP CONTINUE		MST51040
377A	4300 3720		5105		B FALLTHRU		MST51050
			5107	* ROUTINE MAINTAINS COUNTS FOR SCOPE LOOP TESTS			MST51070
			5108	* CALLING SEQUENCE: BAL R15,CNTDOWN			MST51080
			5109	* DAC (CONTINUATION ADRS)			MST51090
			5110	* REGISTERS DESTROYED: RO			MST51100
			5111	*			MST51110
377E	2501		5112	CNTDOWN	LCS RO,1		MST51120
3780	6100 1950		5113		AHM RO,COUNTER	DECREMENT COUNTER	MST51130
3784	4320 3D20		5114		BNP TESTAUT1	REFORMAT/EXIT.	MST51140
3788	26F1		511E	CONTINUE	AIS R15,ADC-1	TO LOAD 'DAC' PARAMETER	MST51150
378A	C4F0 FFFE		5116		NHI R15,0-ADC	FORCE ALIGNMENT TO LOAD	MST51160
378E	48FF 0000		5117		LDA R15,0(R15)	CONTINUATION VECTOR	MST51170
3792	030F		5118		BR R15	CONTINUE	MST51180
			5120	* EVALUATES TRACK FOR USE IN FORMAT-MODE TESTING.			MST51200
			5121	* NO ALTERNATED SECTORS ARE ALLOWED. SECTOR '40' MUST NOT EXIST.			MST51210
			5122	* BAL RETN,TENSECT			MST51220
			5123	*			MST51230
3794	C800 3810		5124	TENSECT	LDAI RO,60CHECK2		MST51240
3798	4000 197E		5125		STA RO,RERN	RERUN ADRS	MST51250
379C	40F0 1988		5126		STA R15,TEMPC		MST51260
37A0	C8D0 003F		5127		LHI SECT,MAXSEC-1	START WITH MAX VALID LOGICAL SECTOR	MST51270
37A4	41F0 369E		5128	TENS.1	BAL R15,CKADSRX	DO READ-CHECK	MST51280
37A8	27D1		5129		SIS SECT,1		MST51290
37AA	2213		5130		BNPS TENS.1		MST51300
			5131	*			MST51310
37AC	2405		5132		LIS RO,X'0005'	FORMAT READ CMD, ONLY	MST51320
37AE	4000 1900		5133		STH RO,WCMD		MST51330
37B2	2501		5134		LCS RO,1		MST51340
37B4	4000 1982		5135		STA RO,ERRFLG	UNCONDITIONAL RETURN	MST51350
37B8	C8C0 0071		513E		LHI OPKEY,X'71'		MST513E0



TEST SEQUENCE SUPPORT RCUTINES

37BC	40C0 1936	5137	STH	OPKEY,OPCODE	=READ-FORMAT OPERATION	MST51370
37C0	41F0 3136	5138	BAL	R15,FMSUDF	SET UP GAP, SYNC BYTES	MST51380
37C4	2403	5139	LIS	RO,3		MST51390
37C6	4000 1964	5140	STA	RO,SIZE	SET TO READ SECTOR HEADER	MST51400
37CA	24D0	5141	LIS	SECT,0		MST51410
37CC	41F0 32DA	5142	GOCHECK	EAL R15,READX	READ DATA FROM PHYSICAL SECTOR	MST51420
37D0	41F0 34E6	5143	EAL	R15,HEADER	SET UP PROPER HEADER IMAGE	MST51430
37D4	41F0 3274	5144	BAL	R15,TDATA	AND CHECK AGAINST THAT READ.	MST51440
37D8	26D1	5145	AIS	SECT,1		MST51450
37DA	C5D0 0040	5146	CLHI	SECT,MAXSEC	TRACK DONE ?	MST51460
37DE	2089	5147	ELS	GOCHECK		MST51470
		5148	*			MST51480
37E0	2501	5149	LCS	RO,1		MST51490
37E2	4000 1982	5150	STA	RO,ERRFLG	UNCONDITIONAL RETURN	MST51500
37E6	41F0 32DA	5151	BAL	R15,READX	CHECK THAT SECTOR '40' NOT PRESENT	MST51510
37EA	41F0 34E6	5152	BAL	R15,HEADER	SET UP SECTOR X'40' HEADER IMAGE	MST51520
37EE	4820 196A	5153	LDA	R2,RDFAOR		MST51530
37F2	D361 0002	5154	LB	WK0,2(R1)	HEADER BYTE 3 IMAGE	MST51540
37F6	D372 0002	5155	LB	WK1,2(R2)	HEADER BYTE 2 READ	MST51550
37FA	0767	5156	XAR	WK0,WK1		MST51560
37FC	4761 0000	5157	XH	WK0,0(R1)	HEADER BYTES 1 & 2 IMAGE	MST51570
3800	4762 0000	5158	XH	WK0,0(R2)	HEADER BYTES 1 & 2 READ	MST51580
3804	2334	5159	BZS	GOCHECK1	BRANCH: HEADER EXISTS.	MST51590
3806	48F0 1988	5160	LDA	R15,TEMPC		MST51600
380A	030F	5161	BR	R15		MST51610
380C	E150 1C26	5163	GOCHECK1	SVC 5,MSG35	'ALTERNATE SECTOR ASSIGNED'	MST51630
3810	E150 1B88	5164	GOCHECK2	SVC 5,MSG26	'SELECT NEW SECTOR OPTION'	MST51640
3814	4300 3CF2	5165	B	EURC	EXIT TEST	MST51650
		5167	*		* SUBROUTINE READS AND CHECKS SELCH TRANSFER END ADDRESS.	MST51670
		5168	*			MST51680
3818	41F0 382A	5169	SLCHK	BAL R15,GETFA	GET SELCH FINAL ADDRESS	MST51690
381C	4800 1968	5170	LDA	RO,EXSELAD	RELOAD ACRS READ FROM SELCH	MST51700
3820	4500 1970	5171	CLA	RO,FA	AS EXPECTED ?	MST51710
3824	C33E	5172	BER	RETN2		MST51720
3826	E16E 0000	5173	SVC	6,0(RETN2)	SELCH FINAL ACRS WRCNG	MST51730
		5174	*		(AC RETURN)	MST51740
		5176	*		* SUBROUTINE READS END ADDRESS FROM SELECTOR CHANNEL	MST51760
		5177	*			MST51770
382A	4840 1794	5178	GETFA	LH SLAD,SELCH+6	LOAD SELCH ADDRESS	MST51780
382E		5179	IFZ	ADC-2		MST51790
382E	CE40 190D	5180	OC	SLAD,STOP		MST51800
3832	C5F0 393C	5181	CLAI	R15,SVC.DRV	WILL NEXT SVC'S ?	MST51810
3836	2383	5182	BNLS	GTFA2	DO NOT ALLOW IT.	MST51820
3838	E110 3D72	5183	SVC	1,PBLK01	TEST SELCH NOT BUSY	MST51830
383C	D940 1968	5184	GTFA2	RH SLAD,EXSELAD		MST51840
		5185		ELSE		MST51850

## TEST SEQUENCE SLPPORT ROUTINES

			5192	ENDC			MST51920
3840	4810	1982	5193	LDA	R1,ERRFLG	PARAM BLK ADRS	MST51930
3844	2116		5194	BMS	GTFA2A	BRANCH: ASSUME UNCCNDX RETURN	MST51940
3846	D301	0001	5195	LB	RO,1(R1)	LCAD REG'0 STATUS IMAGE	MST51950
384A	C300	00F5	5196	THI	RO,X'F5'	ERROR-FREE XFER EXPECTED ?	MST51960
384E	2335		5197	BZS	GTFA3	BRANCH: YES	MST51970
3850	4800	1968	5198	GTFA2A LDA	RO,EXSELAD	NC XFER EXPECTED;	MST51980
3854	4000	1970	5199	STA	RO,FA	ADJUST FOR PROPER PRINTOUT.	MST51990
3858	030F		5200	GTFA3 ER	R15	RETURN	MST52000
			5202	* ROUTINE SETS UP SELCH FOR DATA TRANSFER.			MST52020
			5203	*			MST52030
385A	C300	1911	5204	SLCH	LB	RO,SLCHCMD	SELCH COMMAND USED
385E	4810	196A	5205	LDA	R1,RDFADR	READ BUFFER PCINTER	MST52040
3862	C300	0020	5206	THI	RO,X'20'	SELCH TC READ ?	MST52050
3866	2133		5207	BNZS	SL.1	BRANCH: YES.	MST52060
3868	4810	196C	5208	LDA	R1,WTFADR	WRITE BUFFER PCINTER	MST52070
386C	4010	196E	5209	SL.1 STA	R1,SA		MST52080
3870	4A10	1964	5210	AA	R1,SIZE		MST52090
3874	4280	10B0	5211	BC	ERROR12	MEMORY LIMIT EXCEEDED (16 BIT)	MST52100
3878	4510	1962	5212	CLA	R1,MEMTOP	ABOVE TOP OF MEMORY ?	MST52110
387C	4380	10B0	5213	BNL	ERROR12	BRANCH: YES. ABORT.	MST52120
3880	4010	1970	5214	STA	R1,FA	SELCH BUFFER END ACRS	MST52130
3884			5215	IFZ	ADC-2		MST52140
3884	DE40	190D	5216	GC	SLAD,STOP		MST52150
3888	D840	196E	5217	WH	SLAD,SA		MST52160
388C	D840	1970	5218	WH	SLAD,FA		MST52170
			5219	ELSE			MST52180
			5225	ENDC			MST52190
3890	030F		5226	BR	R15	RETURN.	MST52200
			5228	* ROUTINE ADJUSTS INTERRUPT VECTORS			MST52280
			5229	*			MST52290
3892	481E	0000	5230	INSERT	LH	R1,0(R14)	WHERE TC GET ACRS
389E	4801	0000	5231		LH	RO,0(R1)	LCAD ADRS
389A	241A		5232		LIS	R1,10	
389C	4501	1898	5233	INS.1	CLH	RO,DEVSADR(R1)	
38AC	2333		5234		BES	INS.2	MATCH.
38A2	2712		5235		SIS	R1,2	
38A4	2204		5236		BS	INS.1	
38AE	480E	0002	5237	INS.2	LH	RO,2(R14)	
38AA	4001	18A6	5238		STH	RO,DEVINT(R1)	NEW VECTOR
38AE	430E	0004	5239		B	4(R14)	RETURN
			5241	* ROUTINE PRODUCES MEMORY CONTENTION WHILE SELCH IS ACTIVE.			MST52410
			5242	*			MST52420
	0000	38B2	5243	BACKGRND EQU	*		MST52430

## TEST SEQUENCE SUPPORT ROUTINES

3882	4200 38B2	5244	NOP	*	USER LINKS IN HERE,	MST52440
388E	0200	5245	NOPR			MST52450
3888	D000 3E00	5246	STM	RO,RSAVE		MST52460
388C	45F0 3E1E	5247	CLA	R15,ADC+15+RSAVE		MST52470
38C0	2137	5248	BNES	BCK.1		MST52480
38C2	D2D0 0000	5249	STB	SECT,0	INITIALIZE FOR TEST&SET	MST52490
38C6	D4D0 0000	5250	CLB	SECT,0		MST52500
38CA	2132	5251	BNES	BCK.1		MST52510
38CC	0302	5258	BR	R2	RETURN.	MST52580
		5259				MST52590
38CE	DE40 190D	5260	* BCK.1	OC	STOP SELCH	MST52600
38D2	E190 3DBE	5261		SVC	BACKGROUND FAILURE.	MST52610
38D6	0302	5262		BR	MAY RETURN...	MST52620

## ERROR HANDLER

		5264	*	*****		MST52640
		5265	*			MST52650
		5266	*			MST52660
		5267	*	E R R O R H A N D L E R		MST52670
		5268	*			MST52680
		5269	*			MST52690
		5270	*	SVC.DRV IS THE COMMON STATUS-TEST ROUTINE USED BY ALL TEST MODULES.		MST52700
		5271	*	ENTRY TO THIS ROUTINE IS MADE BY AN 'SVC N,PARBLK' INSTRUCTION,		MST52710
		5272	*			MST52720
		5273	*	FOR SVC'S 0, 1, 2, 3:		MST52730
		5274	*	DEVICE STATUS IS 'ANCED' WITH A MASK, AND THE RESULT IS COMPARED		MST52740
		5275	*	WITH THE REQUIRED STATUS IMAGE. COMPARE FAILURE NORMALLY CAUSES		MST52750
		5276	*	AN ERROR MESSAGE TO BE PRINTED. FOLLOWING AN ERROR, CONTROL MAY		MST52760
		5277	*	OPTIONALLY BE PASSED TO A TRANSFER LOCATION, AND ERROR PRINTOUT		MST52770
		5278	*	MAY OPTIONALLY BE DEFINED AS SUPPRESSED.		MST52780
		5279	*			MST52790
		5280	*	ON TERMINATION OF THE STATUS TEST, CONTROL IS PASSED TO THE		MST52800
		5281	*	INSTRUCTION FOLLOWING THE SUPERVISOR CALL (SVC), UNLESS AN ERROR		MST52810
		5282	*	IS DETECTED. DATA IS DESTROYED IN REGISTERS R0, R1 AND		MST52820
		5283	*	STAT, WHEN THIS ROUTINE IS EXECUTED ON A 16-BIT PROCESSOR.		MST52830
		5284	*			MST52840
		5285	*			MST52850
38D8	D3A0 164A	5286	SVC0.OP	LB STAT,INTSTA	LAST-INTERRUPTING-DEVICE STATUS TEST	MST52860
38DC	4800 1648	5287	LH R0,INTDEV	INTERRUPTING DEVICE		MST52870
38E0	2410	5288	LIS R1,0	SET ENTRY CCDE		MST52880
38E2	4300 393C	5289	B SVC.DRV	ENTER COMMON HANDLER		MST52890
38EE	4800 1794	5291	SVC1.OP	LH R0,SELCH+6	SELECTOR CHANNEL STATUS TEST	MST52910
38EA	9D0A	5292	SSR R0,STAT			MST52920
38EC	2411	5293	LIS R1,1			MST52930
38EE	4300 393C	5294	B SVC.DRV			MST52940
38F2	4800 17A0	5296	SVC2.OP	LH R0,DISCON+6	DISC CONTROLLER STATUS TEST	MST52960
38F6	9D0A	5297	SSR R0,STAT			MST52970
38F8	2412	5298	LIS R1,2			MST52980
38FA	4300 393C	5299	B SVC.DRV			MST52990
38FE	4800 1930	5301	SVC3.OP	LH R0,STATE	CURRENT DRIVE STATUS TEST	MST53010
3902	9D0A	5302	SSR R0,STAT			MST53020
3904	2413	5303	LIS R1,3			MST53030
3906	4300 393C	5304	B SVC.DRV			MST53040
390A	4800 1648	5306	SVC4.OP	LH R0,ERRDEV	TIMEOUT ERROR	MST53060
390E	9D0A	5307	SSR R0,STAT			MST53070
3910	2414	5308	LIS R1,4			MST53080
3912	4300 393C	5309	B SVC.DRV			MST53090
3916	2415	5311	SVC5.OP	LIS R1,5	TEXT MESSAGE, ONLY	MST53110
3918	4300 393C	5312	B SVC.DRV			MST53120
391C	2416	5314	SVC6.OP	LIS R1,6	SELCH FINAL ADDRESS ERROR	MST53140
391E	4800 1794	5315	LH R0,SELCH+6			MST53150
3922	9D0A	5316	SSR R0,STAT			MST53160

## ERRCR HANDLER

3924	230C	5317	BS	SVC.DRV		MST53170
392E	2417	5319	SVC7.CP	LIS	R1,7	DATA COMPARE ERROR
392E	4800 1648	5320		LH	R0,ERRDEV	MST53200
392C	900A	5321		SSR	R0,STAT	MST53210
392E	2307	5322		BS	SVC.DRV	MST53220
393C	2418	5324	SVC8.CP	LIS	R1,8	RPS ERROR
393E	4800 1930	5325		LH	R0,STATE	CURRENT DRIVE ADDRESS
393E	900A	5326		SSR	R0,STAT	MST53260
393E	2302	5327		ES	SVC.DRV	MST53270
393F	2419	5329	SVC9.CP	LIS	R1,9	BACKGROUND TESTING FAILURE
	0000 393C	5331	SVC.DRV	EQU	*	COMMON STATUS TEST DRIVER
393C	4010 1942	5332		STH	R1,SVCNUM	SAVE CALLING SVC NUMBER
394C	4000 1648	5333		STH	R0,ERRDEV	DEVICE IN ERROR
3944		5334		IFZ	ADC-2	MST53340
3944	D000 3E80	5335		STM	R0,INTSAV	SAVE 16-BIT CALLER'S REGISTERS
394E	4810 0094	5336		LH	R1,X'94'	LOAD PARAMETER BLOCK ADDRESS
394C	4820 0098	5337		LH	R2,X'98'	GET OLD LCC
		5338		ELSE		MST53380
		5342		ENDC		MST53420
395C	4010 1960	5343		STA	R1,BLKADRS	AND SAVE.
3954	2724	5344		SIS	R2,4	TO POINT TO 'SVC' INSTRUCTION -
395E	4020 1646	534E		STH	R2,0LOC	FOR ERROR MESSAGE
395A	C2A0 164A	534E		STB	STAT,ERRSTA	SAVE ERROR STATUS
395E	4800 1794	5347		LH	R0,SELCH+E	
3962	D000 198A	5348		SS	R0,STATTAB	GET SELCH STATUS FOR SEG3.
		5349	*			MST53490
396E	2400	5350		LIS	R0,0	MST53500
3968	4000 1928	5351		STH	R0,ERRFLG1	RESET 'ERROR DETECTED' FLAG
396C	2411	5352		LIS	R1,1	SHIFT COUNTER
396E	4820 1942	5353	DRV.1	LH	R2,SVCNUM	GET CALLING CODE
3972	9121	5354		SLLS	R2,1	MST53540
3974	4802 3D4A	5355		LH	R0,SEQTAB(R2)	GET SEQUENCE CONTROL INFO
3978	C001 0000	535E		SLHL	R0,0(R1)	TEST BIT N
397C	2185	5357		BCS	DRV.3	MST53570
397E	4330 3984	5358		EZ	SEGEXIT	BRANCH: NO MORE TO DO.
3982	2611	5359	DRV.2	ALS	R1,1	INCREMENT SHIFT COUNT
3984	220E	5360		BS	DRV.1	AND TRY AGAIN
398E	C800 2020	5361	DRV.3	LHI	R0,C' '	MST53610
398A	4000 1ADE	5362		STH	R0,MSG17+12	MST53620
398E	4000 1AE0	5363		STH	R0,MSG17+14	INITIALIZE ELFFER
3992	C8CC 10FE	5364		LDAI	R12,HEXASC	(GLOBAL REGISTER)
399E	4010 1944	5365		STH	R1,SEGPTR	SAVE FOR NEXT ARGUMENTS
399A	9111	536E		SLLS	R1,LADC	MST536E0
399C	4801 305C	5367		LDA	R0,SEQVECTS-ACC(R1)	GET HANDLER VECTOR
39A0	C1D0	5368		BALR	R13,R0	AND GO TO IT.
39A2	41F0 1126	5369	NEXTSQ	BAL	R15,PRINT	PRINT THE LINE.
39A6	2400	5370	NXTSQ.1	LIS	R0,0	MST53700

## ERROR HANDLER

39A8	4000 166C	5371	STH	RO,ISITERR		MST53710
39AC	4810 1944	5372	LH	R1,SEGPTR		MST53720
39B0	4300 3982	5373	E	DRV.2	CONTINUE...	MST53730
		5374	*			MST53740
39B4	4810 1928	5375	SEGEEXIT	LH R1,ERRFLG1	WAS ERROR DETECTED ?	MST53750
39B8	4230 3C52	5376		BNZ TSCLID	CHECK ABORT	MST53760
	0000 398C	5377	COMRETN	EGU *	EXIT FROM ERROR CHECK ROUTINE	MST53770
39BC	41F0 3642	5378		BAL LINK,DISPLAY	SHOW CYL, SECT, HEAD.	MST53780
39C0	4800 167A	5379		LH RO,BTESTAC		MST53790
39C4	C500 0017	5380		CLHI RO,X*17'	RUNNING RE-FORMAT TEST ?	MST53800
39C8	2333	5381		BES COMR.1	BRANCH: YES, IGNORE BRK.	MST53810
39CA	41F0 128A	5382		BAL R15,TSTBRK	CHECK BREAK KEY	MST53820
39CE	2400	5383	COMR.1	LIS RO,0		MST53830
39D0	4000 166C	5384		STH RO,ISITERR		MST53840
39D4		5385		IFZ ADC-2		MST53850
39D4	C100 3E80	5386		LM RO,INTSAV	RESTORE 16-BIT USER'S REGISTERS	MST53860
39D8	C200 0096	5387	LPSW	X*96'	RETURN	MST53870
		5388	ELSE			MST53880
		5390	ENDC			MST53900
	0000 39DC	5392	SEQ0	EGU *	TESTS DEVICE STATUS, DRIVE RPS	MST53920
39DC	4800 1942	5393		LH RO,SVCNUM		MST53930
39E0	C500 0008	5394		CLHI RO,8	TESTING RPS ?	MST53940
39E4	213B	5395		BNES SEQ0.1	BRANCH: NO.	MST53950
39E6	4810 194E	5396		LH R1,RPSCNT	ACTUAL RPS COUNT	MST53960
39EA	4510 1938	5397		CLH R1,ERPSCNT	EXPECTED RPS COUNT	MST53970
39EE	4330 398C	5398		BE COMRETN	BRANCH: AS EXPECTED.	MST53980
39F2	4000 1928	5399		STH RO,ERRFLG1	SET ERROR FLAG	MST53990
39F6	4300 39A6	5400		B NXTSQ.1		MST54000
		5401	*			MST54010
39FA	4810 1960	5402	SEQ0.1	LDA R1,BLKADRS	GET PELK ADDRESS	MST54020
39FE	D321 0000	5403		LB R2,0(R1)	GET STATUS MASK	MST54030
3A02	042A	5404		NAR R2,STAT	MASK OFF UNTESTED BITS	MST54040
3A04	C421 0001	5405		CLB R2,1(R1)	AND COMPARE WITH REQUIRED IMAGE.	MST54050
3A08	4330 398C	5406		BE COMRETN	BRANCH: NO ERROR.	MST54060
3A0C	2501	5407		LCS RO,1		MST54070
3A0E	4000 1928	5408		STH RO,ERRFLG1	SET 'SVC ERROR' FLAG	MST54080
3A12	4821 0002	5409		LH R2,2(R1)	GET TRANSFER PARAMETER	MST54090
3A16	4210 3CD0	5410		BM XFER	BRANCH: IMMEDIATE VECTOR.	MST54100
3A1A	4300 39A6	5411		B NXTSQ.1		MST54110
	0000 3A1E	5413	SEQ1	EGU *	PRINTS 'ERROR...', 'LOC...'	MST54130
3A1E	2401	5414		LIS RO,1		MST54140
3A20	6100 1678	5415		AHM RO,TOTERR	INCREMENT ETPE ERROR COUNTER	MST54150
3A24	2501	5416		LCS RO,1		MST54160
3A26	4000 1928	5417		STH RO,ERRFLG1	SET SVC.DRV ERROR FLAG	MST54170
3A2A	6100 1932	5418		AHM RO,RRCTR	DECREMENT RETRIES REMAINING	MST54180
3A2E	41F0 3642	5419		BAL LINK,DISPLAY		MST54190
3A32	4810 16AA	5420		LH R1,ETESTNO	GET TEST NUMBER	MST54200

## ERRCR HANDLER

3A3E	4010	166C	5421	STH	R1,ISITERR	FORCE MESSAGE PRINT	MST54210	
3A3A	4010	166E	5422	STH	R1,NOERR	SLFPRESS THIS PRINT	MST54220	
3A3E	4010	1BE6	5423	STH	R1,MSG31+6		MST54230	
3A4E	41F0	11C6	5424	BAL	R15,CRLF		MST54240	
3A4E	2420		5425	LIS	R2,0		MST54250	
3A4E	4800	1942	5426	LH	R0,SVCNUM	SVC CODE	MST54260	
3A4C	C300	0004	5427	THI	R0,X'0004'	PARAMETER BLOCK USED ?	MST54270	
3A5C	2137		5428	BNZS	SEQ1.00	BRANCH: NO (SVC'S 4,5,6,7).	MST54280	
3A52	4820	1960	5425	LDA	R2,BLKADRS	LOAD PBLKNN ADDRESS	MST54290	
3A5E	C322	0003	5430	LB	R2,3(R2)	EXTRACT ERROR NUMBER (NN).	MST54300	
3A5A	C420	000F	5431	NHI	R2,X'000F'		MST54310	
3A5E	5104		5432	SEGL.00	SLLS	R0,4	MST54320	
3A6C	C620		5433	CAR	R2,R0		MST54330	
3A62	4810	1936	5434	LH	R1,CPCODE	GET ERROR CODE (CC)	MST54340	
3A6E	C831		5435	LDAR	R3,R1	CCPY; TEST IF OFFSET OPERATION.	MST54350	
3A68	5034		5436	SRLS	R3,4		MST54360	
3A6A	2734		5437	SIS	R3,4		MST54370	
3A6C	2136		5438	BNZS	SEQ1.0	BRANCH: NOT OFFSET OPERATION.	MST54380	
3A6E	C330	1904	5439	LB	R3,OFFCMD		MST54390	
3A72	C430	000F	5440	NHI	R3,X'000F'		MST54400	
3A7E	C613		5441	CAR	R1,R3	APPEND DETAIL ERROR CODE	MST54410	
3A78	9411		5442	SEGL.0	EXER	R1,R1	MST54420	
3A7A	5221		5443	STBR	R2,R1	BUILD COMPOSITE	MST54430	
3A7C	2404		5444	LIS	R0,4		MST54440	
3A7E	C820	1BE8	5445	LDAI	R2,MSG31+8	DESTINATION	MST54450	
3A82	C1FC		544E	BALR	R15,R12		MST54460	
3A84	C850	1BE0	5447	LDAI	R5,MSG31		MST54470	
3A88	41F0	1126	5448	BAL	R15,PRINT	'ERRCR TTCNN'	MST54480	
3A8C	4810	1942	5449	LH	R1,SVCNUM	CALLING SVC CODE	MST54490	
3A9C	5013		5450	SRLS	R1,3	(SVC'S 4,5,6,7)	MST54500	
3A92	2385		5451	BNCS	SEQ1.1	BRANCH: NORMAL	MST54510	
3A94	4810	1960	5452	LCA	R1,BLKADRS	CALL ADDRESS PASSED IN SVC	MST54520	
3A98	4010	164E	5453	STH	R1,0LOC	SAVE FOR PRINTOUT	MST54530	
3A9C	41E0	103A	5454	SEGL.1	BAL	R14,ERRL1	'LCC LLLL'	MST54540
3AAC	4300	39A6	5455	E	NXTSQ.1		MST54550	
3AA4	C000	3AA4	5457	SEGL.2	EGU	*	PRINTS DEVICE,EXPECTED/ACTUAL STATUS	MST54570
3AA4	2402		5458	LIS	R0,2			MST54580
3AAE	4000	166C	5459	STH	R0,ISITERR	LEVEL 2 SUPPRESSION		MST54590
3AAA	4800	1942	5460	LH	R0,SVCNUM	GET SVC CODE		MST54600
3AAE	2703		5461	SIS	R0,3	PARAMETER BLOCK USED ?		MST54610
3ABC	4220	3AE0	5462	BP	SEQ2A	BRANCH: NO.		MST54620
3ABA	41E0	1014	5463	EAL	R14,ERRCS1	'DEV CCC STA SS'		MST54630
3AB8	4810	1960	5464	LDA	R1,BLKADRS			MST54640
3ABC	C301	0000	5465	LB	R0,0(R1)	STATUS MASK		MST54650
3AC0	C311	0001	5466	LB	R1,1(R1)	STATUS IMAGE		MST54660
3AC4	C320	164A	5467	LB	R2,ERRSTA	ERROR STATUS		MST54670
3ACE	0410		5468	NAR	R1,R0	IMAGE.AND.MASK		MST54680
3ACA	C700	FFFF	5469	XHI	R0,-1			MST54690
3ACE	0420		5470	NAR	R2,R0	STATUS.AND.(.NOT.MASK)		MST54700
3ADC	0612		5471	CAR	R1,R2	LOGICAL OR YIELDS EXPECTED STATUS.		MST54710

## ERROR HANDLER

3AD2	2402	5472		LIS	R0,2		MST54720
3AD4	C820 1ADC	5473		LDAI	R2,MSG17+10	DESTINATION	MST54730
3AD8	01FC	5474		BALR	R15,R12	TO HEXASC	MST54740
3ADA	C850 1AD2	5475		LDAI	R5,MSG17		MST54750
3ADE	0300	5476		BR	R13	'SHOULD BE.....'	MST54760
		5477	*				MST54770
3AEG	4800 1930	5478	SEQ2A	LH	R0,STATE	CURRENT DRIVE ADRS	MST54780
3AE4	4000 1648	5479		STH	R0,ERRDEV		MST54790
3AE8	ED00 164A	5480		SS	R0,ERRSTA		MST54800
3AEC	41E0 1014	5481		EAL	R14,ERRDS1	'DEV DDC STA SS'	MST54810
3AF0	4300 39AE	5482		B	NXTSQ.1		MST54820
	0000 3AF4	5484	SEQ3	EGU	*	PRINTS ALL DEVICE STATUSES	MST54840
3AF4	2412	5485		LIS	R1,2	GET ALL DEVICE STATUSES	MST54850
3AF6	2421	5486		LIS	R2,1		MST54860
3AF8	4801 1898	5487	SEQ3.0	LH	R0,DEVSACR(R1)	GET DEVICE ADDRESS	MST54870
3AFC	ED02 198A	5488		SS	R0,STATTAB(R2)	FLT STATUS IN TAELE	MST54880
3B00	2612	5489		AIS	R1,2		MST54890
3B02	2621	5490		AIS	R2,1		MST54900
3B04	C520 000E	5491		CLHI	R2,6		MST54910
3B08	2088	5492		BLS	SEQ3.0	FOR ALL DEVICES IN TABLE.	MST54920
3B0A	2430	5493		LIS	R3,0	TABLE INDEX	MST54930
3B0C	4030 166C	5494		STH	R3,ISITERR	LEVEL 0 SUPPRESSION	MST54940
3B10	C820 18A8	5495		LDAI	R2,MSG27+7	DESTINATION	MST54950
3B14	2402	5496		LIS	R0,2	EYIE CGLNT	MST54960
3B16	D313 198A	5497	SEQ3.1	LB	R1,STATTAB(R3)	STATUS (HEX)	MST54970
3B1A	01FC	5498		BALR	R15,R12	TO HEXASC	MST54980
3B1C	C810 0020	5499		LHI	R1,C'		MST54990
3B20	D212 0002	5500		STB	R1,2(R2)		MST55000
3B24	2623	5501		AIS	R2,3		MST55010
3B26	2631	5502		AIS	R3,1		MST55020
3B28	C530 000E	5503		CLHI	R3,6		MST55030
3B2C	2088	5504		BLS	SEQ3.1		MST55040
3B2E	241D	5505		LIS	R1,X'0D'	CARRIAGE RETURN	MST55050
3B30	D212 0000	5506		STB	R1,0(R2)	AT END OF MESSAGE	MST55060
3B34	C850 18A1	5507		LDAI	R5,MSG27		MST55070
3B38	0300	5508		BR	R13	'STATUS S1,S2.....'	MST55080
	0000 3B3A	5510	SEQ4	EGU	*	PRINTS CYLINDER, HEAD, SECTOR	MST55100
3B3A	4810 1968	5511		LDA	R1,BCOUNT	GET TDATA BYTE COUNT	MST55110
3B3E	4800 1936	5512		LH	R0,OPCODE		MST55120
3B42	C500 0080	5513		CLHI	R0,X'80'	SOFTWARE BYTE COUNT TO BE USED ?	MST55130
3B46	2337	5514		BES	SEQ4.0	BRANCH: YES.	MST55140
3B48	41F0 382A	5515		BAL	R15,GETFA	READ SELCH FINAL ADDRESS	MST55150
3B4C	4810 1968	5516		LDA	R1,EXSELAD	ADDRESS READ FROM SELCH	MST55160
3B50	4810 196E	5517		SA	R1,SA	LESS START ADRS = LENGTH AT ERROR	MST55170
3B54	C820 0114	5518	SEQ4.0	LHI	R2,PRECL		MST55180
3B58	4800 1934	5519		LH	R0,RWOCMC	OUTPUT COMMAND TO CTRLR	MST55190
3B5C	9003	5520		SRLS	R0,X'03'	FORMAT MODE ?	MST55200



## ERROR HANDLER

3B5E	2183	5521	BCS	SEQ4.1	BRANCH: YES	MST55210
3B60	C820 0100	5522	LHI	R2,LRECL	NCRMAL-MODE BYTE COUNT	MST55220
3B64	4800 1946	5523	LH	R0,CURSECT	GET STARTING SECTOR	MST55230
3B68	0B12	5524	SAR	R1,R2	SUBTRACT BYTES/SECTOR	MST55240
3B6A	2113	5525	BMS	SEQ4.3	BRANCH: DONE.	MST55250
3B6C	2601	5526	AIS	R0,1	INCREMENT SECTOR COUNT	MST55260
3B6E	2203	5527	BS	SEQ4.2		MST55270
3B70	C840 0040	5528	LHI	R4,MAXSEC	ASSUMING 64 SECTORS/TRACK	MST55280
3B74	4850 194A	5529	LH	R5,HEAD	GET STARTING HEAD	MST55290
3B78	2434	5530	LIS	R3,4		MST55300
3B7A	4430 1934	5531	NH	R3,RWCCMC	EXTRACT 'FORMAT' BIT	MST55310
3B7E	4430 1924	5532	NH	R3,FLAGS	TRLLY 65 SECTORS/TRACK ?	MST55320
3B82	2332	5533	BZS	SEQ4.4	BRANCH: NO.	MST55330
3B84	2641	5534	AIS	R4,1	65 SECTORS.	MST55340
3B8E	0504	5535	CLAR	R0,R4	PASSED HEAD BOUNDARY ?	MST55350
3B88	2184	5536	ELS	SEQ4.5	BRANCH: NO.	MST55360
3B8A	0B04	5537	SAR	R0,R4	ADJUST SECTOR NUMBER,	MST55370
3B8C	2651	5538	AIS	R5,1	ADVANCE HEAD NUMBER.	MST55380
3B8E	2204	5539	BS	SEQ4.4	CHECK FOR LARGE XFERS.	MST55390
		5540	*			MST55400
3B90	0810	5541	LDAR	R1,R0	CCPY SECTOR NUMBER	MST55410
3B92	2402	5542	LIS	R0,2	BYTE COUNT	MST55420
3B94	4000 166C	5543	STH	R0,ISITERR	LEVEL 2 PRINT SUPPRESSION	MST55430
3B98	C820 1AF9	5544	LDAI	R2,MSG18+21	DESTINATION	MST55440
3B9C	01FC	5545	BALR	R15,R12	CONVERT LOGICAL SECTOR NUMBER	MST55450
3B9E	0815	5546	LDAR	R1,R5	CCPY HEAD NUMBER	MST55460
3BAC	C820 1AF1	5547	LDAI	R2,MSG18+13	DESTINATION	MST55470
3BA4	01FC	5548	BALR	R15,R12	CONVERT HEAD NUMBER	MST55480
3BA6	4810 194C	5549	LH	R1,CURCYL		MST55490
3BAA	2403	5550	LIS	R0,3		MST55500
3BAC	C820 1AE8	5551	LDAI	R2,MSG18+4		MST55510
3BB0	01FC	5552	BALR	R15,R12	CONVERT CYLINDER ADDRESS	MST55520
3BB2	C850 1AE4	5553	LDAI	R5,MSG18		MST55530
3BBE	030D	5554	BR	R13	'CYL CCC HEAD AN....'	MST55540
		5556	SEGE	EQU *	LOGS COMMENTARY MESSAGE VIA SVC	MST55560
3BB8	4850 1960	5557	LDA	R5,BLKADRS	MESSAGE ADDRESS	MST55570
3BBC	4050 166C	5558	STH	R5,ISITERR	FORCE PRINT	MST55580
3BC0	030D	5559	BR	R13	LOG MESSAGE	MST55590
		5561	SEGE	EQU *	PRINTS SELCH FINAL ADRS ERROR	MST55610
3BC2	0000 3BC2	5562	EAL	R15,GETFA	GET SELCH FINAL ADDRESS	MST55620
3BC6	2401	5563	LIS	R0,1		MST55630
3BC8	4000 166C	5564	STH	R0,ISITERR	LEVEL 1 PRINT SUPPRESSION	MST55640
3BCC	4810 1968	5565	LDA	R1,EXSELAD	RELOAD SELCH FINAL ADDRESS	MST55650
3BDC	2404	5566	LIS	R0,ADC+2	DIGIT COUNT	MST55660
3BD2	C820 1AC4	5567	LDAI	R2,MSG16+5	DESTINATION	MST55670
3BDE	01FC	5568	BALR	R15,R12	CONVERT EXPECTED FA	MST55680
3BDE	C850 1AC1	5569	LDAI	R5,MSG16		MST55690

## ERROR HANDLER

3BDC	41F0 1126	5570		BAL	R15,PRINT	'SELCH FA.....'	MST55700
3BEC	4810 1970	5571		LDA	R1,FA	EXPECTED END ACRS	MST55710
3BE4	C820 1ADC	5572		LDAI	R2,MSG17+10	DESTINATION	MST55720
3BE8	01FC	5573		BALR	R15,R12		MST55730
3BEA	C850 1AD2	5574		LDAI	R5,MSG17		MST55740
3BEE	0300	5575		BR	R13	'SHOULD BE.....'	MST55750
3BF0	0000 3BF0	5577	SEQ7	EGU	*	PRINTS DATA COMPARE ERROR	MST55770
3BF4	4810 1968	5578		LDA	R1,BCOUNT	BYTE COUNT AT DATA COMPARE ERROR	MST55780
3BF6	2404	5579		LIS	R0,ADC+2		MST55790
3BF8	C820 1AB0	5580		LDAI	R2,MSG15+6	DESTINATION	MST55800
3BFA	01FC	5581		BALR	R15,R12	CONVERT BYTE COUNT	MST55810
3BFC	2404	5582		LIS	R0,4	BYTE COUNT	MST55820
3BFE	4810 193A	5583		LH	R1,EDATA	EXPECTED DATA	MST55830
3C02	C820 1ADC	5584		LDAI	R2,MSG17+10		MST55840
3C06	01FC	5585		BALR	R15,R12	CONVERT GOOD DATA	MST55850
3C08	4810 193C	5586		LH	R1,RDATA	DATA READ	MST55860
3C0C	C820 1ABC	5587		LDAI	R2,MSG15+18		MST55870
3C10	01FC	5588		BALR	R15,R12	CONVERT BAD DATA	MST55880
3C12	C850 1AAA	5589		LDAI	R5,MSG15		MST55890
3C16	41F0 1126	5590		BAL	R15,PRINT	'BYTES .... READ ....'	MST55900
3C1A	C850 1AD2	5591		LDAI	R5,MSG17		MST55910
3C1E	0300	5592		BR	R13	'SHOULD BE...'	MST55920
3C20	0000 3C20	5594	SEQ8	EGU	*	CHECKS AND PRINTS RPS ERROR, IF ANY	MST55940
3C22	2402	5595		LIS	R0,2	BYTE COUNT	MST55950
3C26	4000 166C	5596		STH	R0,ISITERR	LEVEL 2 SUPPRESSION	MST55960
3C2E	4810 194E	5597		LH	R1,RPSCNT	ACTUAL RPS COUNT & CTRLR IDLE	MST55970
3C2A	C820 1BDD	5598		LDAI	R2,MSG30+5		MST55980
3C2E	01FC	5599		BALR	R15,R12	CONVERT CURRENT RPS COUNT	MST55990
3C30	C820 1ADC	5600		LDAI	R2,MSG17+10		MST56000
3C34	4810 1938	5601		LH	R1,ERPSCAT	LOAD EXPECTED RPS COUNT	MST56010
3C38	01FC	5602		BALR	R15,R12	CONVERT EXPECTED CCUNT	MST56020
3C3A	C850 1BD8	5603		LDAI	R5,MSG30		MST56030
3C3E	41F0 1126	5604		BAL	R15,PRINT	'RPS...'	MST56040
3C42	C850 1AD2	5605		LDAI	R5,MSG17		MST56050
3C46	0300	5606		BR	R13	'SHOULD BE.....'	MST56060
3C48	0000 3C48	5608	SEQ9	EGU	*	PRINTS BKGRND FAILURE MESSAGE	MST56080
3C4C	C850 1C02	5609		LDAI	R5,MSG33		MST56090
3C50	4050 166C	5610		STH	R5,ISITERR	FORCE PRINT	MST56100
3C50	0300	5611		BR	R13	'BACKGROUND FAILURE'	MST56110
3C52	0000 3C52	5613	TSOLID	EGU	*	DECIDES IF TO ABORT TEST ON ERROR	MST56130
3C52	4800 17C4	5614		LH	R0,RETRY+6		MST56140

ERROR HANDLER

3C5E	4330	3CF2	5615	BZ	EURC	ALWAYS ABCRT ON 'NC RETRYS'	MST56150
3C5A	4800	1924	5616	LH	RO,FLAGS	LOAD MODULE FLAGS	MST56160
3C5E	5002		5617	SRLS	RO,X'02'	'DC NOT ABORT' ?	MST56170
3C6C	2185		5618	BCS	RERUN	BRANCH: YES.	MST56180
3C6Z	4800	1932	5619	LH	RO,RRCTR		MST56190
3C6E	4210	3CF2	5620	BM	EURC	ABCRT ON (RETRY) ERRORS.	MST56200
	0000	3C6A	5622	RERUN	EQU *	ATTEMPTS ERROR RECOVERY	MST56220
3C6A	4880	194C	5623	LH	TRACK,CURCYL		MST56230
3C6E	4840	1794	5624	LH	SLAD,SELCH+6		MST56240
3C72	DE40	190D	5625	CC	SLAD,STOP	STOP SELCH	MST56250
3C7E	4830	17A0	5626	LH	DCAD,DISCCN+6		MST56260
3C7A	DE30	1908	5627	OC	DCAD,RESET	RESET CONTROLLER	MST56270
3C7E	2400		5628	LIS	RO,0		MST56280
3C80	4850	1930	5629	LH	FUT,STATE		MST56290
3C84	5850		5630	WHR	FUT,RO		MST56300
3C86	DE50	1903	5631	OC	FUT,HEDCMD	SET HEAD 0	MST56310
3C8A	240F		5632	LIS	RO,15		MST56320
3C8C	41F0	10BA	5633	BAL	R15,TIMER	UNCONDX WAIT 15 MSEC.	MST56330
3C9C	DE50	1907	5634	CC	FUT,CLEAR	CLEAR FALLT	MST56340
3C94	41F0	10BA	5635	BAL	R15,TIMER	UNCONDX WAIT 15 MSEC.	MST56350
3C9E	505A		5636	SSR	FUT,STAT		MST56360
3C9A	4320	3CC4	5637	BFC	SEEKINC,RER1	BRANCH: NO RESTORE NECESSARY.	MST56370
3C9E	DE50	190A	5638	CC	FUT,RESTCC	RESTORE.	MST56380
3CA2	C800	06D6	5639	LHI	RO,1750		MST56390
3CAE	41F0	10BA	5640	BAL	R15,TIMER	UNCONDX WAIT 1750 MSEC.	MST56400
3CAA	DE50	194C	5641	WH	FUT,CURCYL		MST56410
3CAE	DE50	1902	5642	CC	FUT,CYLCMD	SET CYLINDER	MST56420
3CB2	240F		5643	LIS	RO,15		MST56430
3CB4	41F0	10BA	5644	BAL	R15,TIMER	UNCONDX WAIT 15 MSEC.	MST56440
3CB8	DE50	1909	5645	OC	FUT,SEEKC	RE-SEEK 'CURRENT CYLINDER'	MST56450
3CBC	C800	0096	5646	LHI	RO,150		MST56460
3CC0	41F0	10BA	5647	BAL	R15,TIMER	UNCONDX WAIT 150 MSEC.	MST56470
3CC4	48F0	197E	5648	RER1	LDA RETN,RERN	GET RERUN ADDRESS	MST56480
3CC8	4800	1942	5649	LH	RO,SVCNUM		MST56490
3CCC	2703		5650	SIS	RO,3	XFER LEGAL (SVC'S 0-3) ?	MST56500
3CCE	212B		5651	EPS	RER.3	BRANCH: NO.	MST56510
3CDG	4810	1960	5652	XFER	LDA R1,ELKADRS		MST56520
3CD4	D321	0002	5653	LB	R2,2(R1)	GET TRANSFER SFEC	MST56530
3CDE	C420	007F	5654	NHI	R2,X'7F'		MST56540
3CDC	2334		5655	BZS	RER.3	BRANCH: NO VECTOR TO TAKE	MST56550
3CDE	5121		5656	SLLS	R2,LADC		MST56560
3CE0	48F2	3DDC	5657	LCA	RETN,XFERTAE-ADC(R2)		MST56570
3CE4			5658	IFZ	ADC-2		MST56580
3CE4	40F0	0098	5659	RER.3	STH RETN,X'98'		MST56590
			5660	ELSE			MST56600
			5662	ENDC			MST56620
3CE8	4300	39BC	5663	B	COMRETN	RETURN TO RERUN ADDRESS	MST56630

## ERROR HANDLER

		5665	*	RESERVED TO ALTERNATE CHANNEL - ABORT SUBTEST.		MST56650
		5666	*			MST56660
3CEC	C850 1AFC	5667	RESERVED	LDAI R5,MSG19	'ALTERNATE CHANNEL BUSY'	MST56670
3CFO	2307	5668		BS TABORT	ABORT TEST	MST56680
		5670	*	SOLID ERROR - ABORT SUBTEST.		MST56700
		5671	*			MST56710
3CF2	4800 1924	5672	EURC	LH R0,FLAGS	LOAD MODULE FLAGS	MST56720
3CF6	4210 3D3A	5673		BM TABCR.1	BRANCH: REFORMAT ABORTED.	MST56730
3CFA	C850 1A9C	5674		LDAI R5,MSG14		MST56740
3CFE	4050 166C	5675	TABORT	STH R5,ISITERR		MST56750
3D02	4050 166E	5676		STH R5,NCERR	SUPPRESS THAT PRINT.	MST56760
3D06	41F0 1126	5677		BAL R15,PRINT	'SCLID ERROR'	MST56770
3D0A	4860 16AA	5678		LH WKO,ETESTAC		MST56780
3D0E	4060 1B66	5679		STH WKO,MSG24+6		MST56790
3D12	C850 1B60	5680		LDAI R5,MSG24		MST56800
3D16	41F0 1126	5681		BAL R15,PRINT	'TEST XX ABORTED'	MST56810
3D1A	2400	5682		LIS R0,0		MST56820
3D1C	4000 166C	5683		STH R0,ISITERR		MST56830
3D20	4800 1926	5684	TESTAUT1	LH R0,RFMTFLG	REQUIRES REFORMAT ?	MST56840
3D24	4330 0E32	5685		BZ ISTEND	BRANCH: NO.	MST56850
3D28	4800 1854	5686		LH R0,NOAUTO+6	TEST IF REFORMAT INHIBITED	MST56860
3D2C	4230 0E32	5687		BWZ ISTEND	BRANCH: INHIBITED.	MST56870
3D30	4810 0A22	5688		LH R1,PSW2		MST56880
3D34	9501	5689		EPSR R0,R1	SELECT USER REGISTER SET	MST56890
3D36	4300 2D44	5690		B REFORMAT	PERFORM AUTO RE-FORMAT.	MST56900
		5691	*			MST56910
3D3A	C850 1C15	5692	TABCR.1	LDAI R5,MSG34		MST56920
3D3E	4050 166C	5693		STH R5,ISITERR		MST56930
3D42	41F0 1126	5694		BAL R15,PRINT	'REFORMAT ABORTED'	MST56940
3D46	4300 0AEC	5695		B OPTIN	HALT TESTING.	MST56950
		5697	SEQTAB	EQU *	E11 TABLE FOR SEQUENCING PRINTCUT	MST56970
3D4A	F800	5698		DCX F800	SVC 0	MST56980
3D4C	F800	5699		DCX F800	SVC 1	MST56990
3D4E	F800	5700		DCX F800	SVC 2	MST57000
3D50	F800	5701		DCX F800	SVC 3	MST57010
3D52	7800	5702		DCX 7800	SVC 4	MST57020
3D54	0400	5703		DCX 0400	SVC 5	MST57030
3D56	7A00	5704		DCX 7A00	SVC 6	MST57040
3D58	7900	5705		DCX 7900	SVC 7	MST57050
3D5A	F080	5706		DCX F080	SVC 8	MST57060
3D5C	4040	5707		DCX 4040	SVC 9	MST57070
		5709		ALIGN ACC		MST57090
3D5E	0000 3D5E	5710	SEQVECTS	EGU *	PRINTCUT MODULE ENTRY ADDRESSES	MST57100
3D5E	39DC	5711		CAC SEQ0	STATUS/RPS TESTS	MST57110

## ERROR HANDLER

3D60	3A1E	5712	DAC	SEQ1	'ERROR..','LCC..'	MST57120
3D62	3AA4	5713	DAC	SEQ2	'DEV..STA..';SHOULD BE..'	MST57130
3D64	3AF4	5714	DAC	SEQ3	'STATUS S1 S2 ...'	MST57140
3D66	3B3A	5715	DAC	SEQ4	'CYL..HEAD..SECT..'	MST57150
3D68	3BB8	5716	DAC	SEQ5	MESSAGES	MST57160
3D6A	3BC2	5717	DAC	SEQ6	'SELCH FA..';SHOULD BE..'	MST57170
3D6C	3BF0	5718	DAC	SEQ7	'BYTES..READ..';SHOULD BE..'	MST57180
3D6E	3C20	5719	DAC	SEQ8	'RPS..';SHOULD BE..'	MST57190
3D70	3C48	5720	DAC	SEQ9	'BACKGROUND FAILURE'	MST57200

## PARAMETER BLCKCS

		5722	*	PARAMETER BLOCKS DEFINED HERE ARE USED BY THE SVC.DRV COMMON STATUS		MST57220	
		5723	*	TEST ROUTINE. ENTRIES IN THE PARAMETER BLOCK HAVE THE FOLLOWING		MST57230	
		5724	*	MEANINGS:		MST57240	
		5725	*			MST57250	
		5726	*	+0 - STATUS MASK		MST57260	
		5727	*	+1 - STATUS IMAGE		MST57270	
		5728	*	+2 - TRANSFER CONTROL		MST57280	
		5729	*	BIT 0		MST57290	
		5730	*	IF BIT 0 = 0, TRANSFER IS TAKEN AFTER ERROR PRINT		MST57300	
		5731	*	IF BIT 0 = 1, TRANSFER TAKEN IMMEDIATELY ON ERROR		MST57310	
		5732	*	BITS 1-7		MST57320	
		5733	*	POINTER TO 127-ENTRY (MAX) VECTOR TABLE		MST57330	
		5734	*	+3 - ERROR NUMBER		MST57340	
		5736	*	-----		MST57360	
		5737	*			MST57370	
		5738	*	DRIVE STATUS DICTIONARY		MST57380	
		5739	*			MST57390	
		5740	*	BIT 0 DRIVE WRITE PROTECT		MST57400	
		5741	*	BIT 1 NOT USED		MST57410	
		5742	*	BIT 2 ALTERNATE CHANNEL SELECTED		MST57420	
		5743	*	BIT 3 DRIVE UNSAFE		MST57430	
		5744	*	BIT 4 DRIVE NOT READY		MST57440	
		5745	*	BIT 5 EXAMINE		MST57450	
		5746	*	BIT 6 SEEK INCOMPLETE		MST57460	
		5747	*	BIT 7 DRIVE OFF-LINE		MST57470	
		5748	*			MST57480	
		5749	*			MST57490	
		5750	*	CONTROLLER STATUS DICTIONARY		MST57500	
		5751	*			MST57510	
		5752	*	BIT 0 WRITE PROTECT		MST57520	
		5753	*	BIT 1 HEADER COMPARE FAILURE		MST57530	
		5754	*	BIT 2 DEFECTIVE SECTOR		MST57540	
		5755	*	BIT 3 CYLINDER OVERFLOW		MST57550	
		5756	*	BIT 4 BUSY (SHOULD BE IGNORED)		MST57560	
		5757	*	BIT 5 EXAMINE		MST57570	
		5758	*	BIT 6 CONTROLLER IDLE		MST57580	
		5759	*	BIT 7 DATA TRANSFER ERROR		MST57590	
		5760	*			MST57600	
		5761	*	-----		MST57610	
3D72	0800	5763	PBLK01	DB	BSY,0	NOT BUSY, SELCH	MST57630
3D74	0011	5764		DCX	0011	ERROR NUMBER	MST57640
3D76	FE0A	5766	PBLK02	DB	X*FE*,BSY+IDLE	BSY+IDLE,CTRLR (DTE=DON'T CARE)	MST57660
3D78	0021	5767		DCX	0021	ERROR NUMBER	MST57670
3D7A	2000	5769	PBLK03	DB	ALTCHAN,0	ALTCHAN NOT BUSY, DRIVES	MST57690
3D7C	0531	5770		DCX	0531	(TRANSFER)	MST57700

PARAMETER BLOCKS

3D7E	FF00	5772	PBLK04	DB	-1,0	ZERO STATUS, DRIVES	MST57720
3D80	C031	5773		DCX	0031	ERRCR NUMBER	MST57730
3D82	0202	5775	PBLK05	DB	SEEKINC,SEEKINC	SEEK INCCMPLETE, DRIVES	MST57750
3D84	C032	5776		DCX	0032	ERROR NUMBER	MST57760
3D86	0200	5778	PBLK06	DB	SEEKINC,0	SEEKINC RESET, DRIVES	MST57780
3D88	0031	5779		DCX	0031	ERROR NUMBER	MST57790
3D8A	FF08	5781	PBLK07	DB	X*FF*,NOTRCY	ACTRCY SET, DRIVES	MST57810
3D8C	C032	5782		DCX	0032	ERRCR NUMBER	MST57820
3D8E	F726	5784	PBLK08	DB	X*F7*,DEFSEC+EX+IDLE	DEF SEC, CTRLR	MST57840
3D90	C022	5785		DCX	0022	ERROR NUMBER	MST57850
3D92	F703	5787	PBLK09	DB	X*F7*,IDLE+DATERR	LRC ERRCR, CTRLR	MST57870
3D94	C022	5788		DCX	0022	ERROR NUMBER	MST57880
3D96	F746	5790	PBLK0A	DB	X*F7*,PCFAIL+EX+IDLE	HEADER FAIL, CTRLR	MST57900
3D98	0022	5791		DCX	0022	ERROR NUMBER	MST57910
3D9A	F786	5793	PBLK0B	DB	X*F7*,WRTPR+EX+IDLE	WRITE PRCTECT, CTRLR	MST57930
3D9C	0022	5794		DCX	0022	ERROR NUMBER	MST57940
3D9E	F716	5796	PBLK0C	DB	X*F7*,CYLOW+EX+IDLE	CYLINDER CVERFLOW,CTRLR	MST57960
3D9C	C022	5797		DCX	0022	ERROR NUMBER	MST57970
3DA2	C800	5799	PBLK0D	DB	BSY,0	ACT BUSY, SELCH	MST57990
3DA4	C011	5800		DCX	0011	ERRCR NUMBER	MST58000
3DA6	F702	5802	PBLK0E	DB	X*F7*,IDLE	IDLE, CTRLR	MST58020
3DA8	0021	5803		DCX	0021	ERROR NUMBER	MST58030
3DAA	0909	5805	PBLK0F	DB	BSY+OFFLINE,BSY+CFFLINE	ECT+ SET, DRIVES	MST58050
3DAC	0032	5806		DCX	0032	ERRCR NUMBER	MST58060
3DAE	F500	5808	PBLK13	DB	X*F5*,0	BSY+SEEKINC NOT TESTED, DRIVES	MST58080
3DB0	0031	5809		DCX	0031	ERRCR NUMBER	MST58090
3DB2	FF02	5811	PBLK14	DB	-1,IDLE	IDLE ONLY, CTRLR	MST58110

## PARAMETER BLOCKS

3DB4	0121	5812		DCX	0121	(TRANSFER) ERROR NUMBER	MST58120
3DB6	F702	5814	PBLK16	DB	X*F7*,IDLE	ICLDE, CTRLR	MST58140
3DB8	0221	5815		DCX	0221	(TRANSFER)	MST58150
3DBA	FF84	5817	PBLK18	DB	-1,WRTPR+EX	WRITE PROTECT+EXAMINE, DRIVES	MST58170
3DBC	0032	5818		DCX	0032	ERROR NUMBER	MST58180
3DBE	0000	5820	PBLK20	DB	0,0	BACKGROUND TEST FAILURE	MST58200
3DCC	0091	5821		DCX	0091	ERROR NUMBER	MST58210
3DC2	F702	5823	PBLK21	DB	X*F7*,IDLE	ELSY+IDLE ONLY, CTRLR	MST58230
3DC4	0021	5824		DCX	0021	ERRCR NUMBER	MST58240
3DC6	0000	5826	PBLK22	DB	0,0	DRIVE RPS FAILURE	MST58260
3DC8	0081	5827		DCX	0081	ERROR NUMBER	MST58270
3DCA	F702	5829	PBLK23	DB	X*F7*,IDLE	ICLDE ONLY, CTRLR	MST58290
3DCC	0221	5830		DCX	0221	(TRANSFER)	MST58300
3DCE	F726	5832	PBLK25	DB	X*F7*,DEFSEC+EX+IDLE	DEFECTIVE SECTOR	MST58320
3DD0	G322	5833		DCX	0322	(TRANSFER)	MST58330
3DD2	F702	5835	PBLK26	DB	X*F7*,IDLE	ICLDE, CTRLR	MST58350
3DD4	0021	5836		DCX	0021	ERROR NUMBER	MST58360
3DD6	FF08	5838	PBLK30	DB	-1,NOTRDY	ACT READY, DRIVES	MST58380
3DD8	0031	5839		DCX	0031	ERROR NUMBER	MST58390
3DDA		5841		DS	4	DUMMY	MST58410
3DDE	36EA	5843	XFERTAB	DAC	ERRCK	VECT 01	MST58430
3DE0	3362	5844		DAC	DXTL.1	VECT 02	MST58440
3DE2	35E6	5845		DAC	FLAG.0	VECT 03	MST58450
3DE4	2D48	5846		DAC	TEST17	VECT 04	MST58460
3DE6	3CEC	5847		DAC	RESERVED	VECT 05	MST58470
3DE8		5848		DS	ADC	DUMMY	MST58480
	0000 3DES	5850	LNZB	EQU	*-1		MST58500



## PARAMETER BLOCKS

3DEA		5852	**CHKSUM			MST58520
3DEA		5853	ALIGN	2		MST58530
3DF0		5854	CPTBUF	DS	6	MST58540
3DF2		5855	ICSAVE	DS	2	MST58550
3DF8		5856	TEMP	DS	2	MST58560
3DF8		5857	ALIGN	8		MST58570
3DFC	0000 0000	5858	PSMSAVE	DCY	0,0	MST58580
3DFC	0000 0000					
3E00		5859	RSAVE	DS	128	MST58590
3E80		5860	INTSAV	DS	64	MST58600
3E00		5861	ERRSAVE	DS	64	MST58610
		5862	*	DS	256	MST58620
0000 3F00		5864	WTF	EQU	*	MST58640
0000 4350		5865	RDF	EQU	PRECL*4+WTF	MST58650
0000 47A0		5866	DEFEND	EQU	PRECL*8+WTF	MST58660
0000 CB28		5867	MAXEND	EQU	MAXSEC+1*PRECL*2+WTF	MST58670

CPTION INPUT BUFFFFER  
 USER I/C DEFINITION  
 SCRATCHPAD  
 PPF PSW SAVE AREA  
 REGISTER SAVE AREA  
 REGISTERS ON EXT/IMP INTERRUPT  
 STORAGE FOR ERROR ROUTINES  
 REG SETS 4-F, 8/32 WITH 8 SETS

DEFAULT WRITE BUFFFFER  
 DEFAULT READ BUFFFFER  
 DEFAULT BUFFFFER END ADRS  
 DEFAULT 65-SECTOR RDF END ADRS

## CHKSUM/M17 PUNCHER

3F00	2400	5865	\$CHKSUM	LIS	R0,0	PUNCH M17 TAPE WITH CHECKSUM	MST58650
3F02	5510	5870		EPSR	R1,R0	SELECT REG. SET 0	MST58700
		5871	*				MST58710
3F04	C810 0A00	5872		LDAI	R1,CRIGI1	START	MST58720
3F08	2421	5873		LIS	R2,1	INCREMENT	MST58730
3F0A	C830 3DE9	5874		LDAI	R3,LNZB	FINAL	MST58740
3F0E	2440	5875		LIS	R4,0	CHECKSUM BYTE	MST58750
3F10	D351 0000	5876	\$GEN	LB	R5,0(R1)		MST58760
3F14	C745	5877		XAR	R4,R5		MST58770
3F16	C110 3F10	5878		EXLE	R1,\$GEN		MST58780
3F1A	D240 0097	5879		STB	R4,MN+3	CHECKSUM BYTE TO BCOT LOADER	MST58790
		5880	*				MST58800
3F1E	C810 0080	5881	\$TAPE	LHI	R1,X*0080'		MST58810
3F22	9E21	5882		OCR	R2,R1	DISPLAY : NORMAL MODE	MST58820
3F24	9444	5883		EXBR	R4,R4		MST58830
3F26	9824	5884		WHR	R2,R4	CHECKSUM BYTE TO D1	MST58840
3F28	9411	5885		EXBR	R1,R1		MST58850
3F2A	5501	5886		EPSR	R0,R1	HALT PROCESSOR.	MST58860
3F2C	D360 007A	5888	\$PUNCH	LB	R6,X*7A'	GET BCOTCV (PUNCH) ADDRESS.	MST58880
3F30	DE60 007B	5889		OC	R6,X*7B'	START TAPE PUNCH	MST58890
3F34	9D60	5890		SSR	R6,R0		MST58900
3F36	2081	5891		BTBS	8,1		MST58910
3F38	41F0 3F7A	5892		BAL	R15,\$TAPL	PUNCH LEADER	MST58920
3F3C	9411	5893		EXBR	R1,R1	(R1) = X*0080'	MST58930
3F3E	C830 00CF	5894		LHI	R3,X*CF'		MST58940
3F42	DA61 0000	5895	\$PNCH1	WD	R6,0(R1)	PUNCH BCOT LOADER	MST58950
3F46	9D60	5896		SSR	R6,R0		MST58960
3F48	2081	5897		BTBS	8,1		MST58970
3F4A	C110 3F42	5898		EXLE	R1,\$PNCH1		MST58980
3F4E	41F0 3F80	5899		BAL	R15,\$TAPL1	PUNCH ONE-FOLD GAP.	MST58990
		5900	*				MST59000
3F52	D340 0097	5901		LB	R4,MN+3	GET CHECKSUM BYTE	MST59010
3F56	C810 0A00	5902		LDAI	R1,CRIGI1	(ACRIPALLY X*ADD')	MST59020
3F5A	C830 3DE9	5903		LDAI	R3,LNZB		MST59030
3F5E	D351 0000	5904	\$PNCH2	LB	R5,0(R1)	PUNCH PROGRAM	MST59040
3F62	0745	5905		XAR	R4,R5		MST59050
3F64	9A65	5906		WDR	R6,R5		MST59060
3F66	9401	5907		EXBR	R0,R1		MST59070
3F68	9820	5908		WHR	R2,R0	DATA ADDRESS TO DISPLAY.	MST59080
3F6A	9D60	5909		SSR	R6,R0		MST59090
3F6C	2081	5910		BTBS	8,1		MST59100
3F6E	C110 3F5E	5911		EXLE	R1,\$PNCH2		MST59110
3F72	41F0 3F7A	5912		BAL	R15,\$TAPL	PUNCH TRAILER.	MST59120
3F76	4300 3F1E	5913		B	\$TAPE	DISPLAY CHECKSUM, HALT PROCESSOR.	MST59130
3F7A	C800 0100	5915	\$TAPL	LHI	R0,256	TO PUNCH BLANK LEADER	MST59150
3F7E	2303	5916		BS	\$TAPLP		MST59160
3F80	C800 0055	5917	\$TAPL1	LHI	R0,85	TO PUNCH 1-FOLD GAP	MST59170
3F84	2701	5918	\$TAPLP	SIS	R0,1		MST59180
3F8E	C32F	5919		BNPR	R15	RETURN	MST59190

PSM DISC TEST 06-200F01M96R01A13 (16-BIT)

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CHKSUM/M17 PUNCHER

3F88	2430	5920	LIS	R3,0
3F8A	5A63	5921	WDR	R6,R3
3F8C	9D68	5922	SSR	R6,R8
3F8E	2081	5923	BTBS	8,1
3F90	2206	5924	BS	\$TAPLP
		5925		
3F92		5926	END	

PUNCH BLANK FRAME

CONTINUE.

MST59200  
MST59210  
MST59220  
MST59230  
MST59240  
MST59250  
MST59260





CHKSUM/M17 PUNCHER

CWA.1	0000	3464	4766*	4769	4789														
CWAIT	0000	3456	2038	3180	4242	4675	4721	4732	4752	4762*	4596	5034							
CYLCMD	0000	1902	1475*	4720	5642														
CYLCV	0000	0010	1511*	5756															
CYLTAB	0000	18FC	1465*	1850															
DATA	0000	17D6	1423*	2511	3354	3420	3500	3550	3601	3527	4515								
DATERR	0000	0001	1515*	5787															
DCAC	0000	0003	1602*	2023	2027	2863	3075	3091	3104	3118	3878	4241	4445	4643	4765				
			4766	4851	4852	4876	4880	5023	5626	5627									
DECTAB	0000	1680	1377*																
DEFENC	0000	47A0	5866*																
DEFSEC	0000	0020	1510*	5784	5832														
DEFTSTS	0000	1888	391	353	1460*														
DEVINT	0000	18A6	1197	1450*	2012	5238													
DEVMSG	0000	16CA	701	1389*															
DEVMSG2	0000	16DA	677	1353*															
DEVSACR	0000	1898	427	1112	1191	1442*	1504	1506	1509	5233	5487								
DISCON	0000	179A	1418*	1839	1505	2023	2881	5054	5057	5256	5626								
DISPLAY	0000	2642	3176	4976*	5378	5419													
DRIVE	0000	17A6	1419*	1760	1828														
DRV.1	0000	396E	5353*	5360															
DRV.2	0000	3982	5355*	5373															
DRV.3	0000	3986	5357	5361*															
DWA.1	0000	34A4	4797*	4803															
DWA.2	0000	348E	4801	4804*															
DWAIT	0000	3496	2200	4743	4756	4753*	4598												
DXTL.1	0000	3362	4655*	5844															
DXTL.2R	0000	336C	4654	4657	4659*														
DXTL.4R	0000	338A	4663	4668*															
DXTL.5R	0000	3398	4665	4672*															
ECHC	0000	1254	922*	1144															
ECHRTN	0000	126A	924	929*															
EDATA	0000	193A	1544*	4580	5583														
EDTMSG	0000	1734	551	1403*															
ERANK	0000	3518	3955	4127	4211	4294	4859*												
ERANK.1	0000	3550	2676	4874*															
ERASX	0000	3326	4638*	4883															
ERPSCNT	0000	1938	1543*	4024	4087	4150	4367	5397	5601										
ERR	0000	0F1E	606*	1274															
ERR1	0000	0FDA	608	617	622	627	633	638	666*										
ERRALL	0000	0F90	636*	1226	1236														
ERRCK	0000	36EA	5045*	5843															
ERRCK1	0000	36F6	5046	5049*															
ERRCOM	0000	0FA8	607	616	621	626	632	637	645*										
ERRCOM1	0000	0FC4	645	655*															
ERRCOM2	0000	0F2A	609*	619	624	629	635	641											
ERRD	0000	0F3C	615*																
ERRD1	0000	0FE4	618	673*															
ERRDEV	0000	1648	674	694	1335*	3068	4765	4776	4796	5306	5320	5333	5475						
ERRDS	0000	0F64	625*																
ERRDS1	0000	1014	628	639	693*	5463	5481												
ERRFLG	0000	1982	1577*	2019	2590	2673	2681	2779	2795	2854	3447	3773	3957	4091	4231				
			4298	4369	4613	4623	4650	4659	4869	4928	5135	5150	5153						















CHKSUM/M17 PUNCHER

OPTCMD3	0000	0BD4	298*	317																
OPTCMD4	0000	0BDA	300*																	
OPTCMD5	0000	0BEC	302	305*																
OPTCMD6	0000	0BFC	307	310*																
OPTCMD7	0000	0C08	295	313*																
OPTCMD71	0000	0C1A	318*																	
OPTCMD8	0000	0C28	283	326*																
OPTCMD9	0000	0C32	325*	356																
CPTENC	0000	187E	1438*																	
OPTENC2	0000	185A	355	1434*																
OPTIN	0000	0AEC	219*	240	349	373	395	415	441	554	602	969	1130	1675	1708					
			1753	5695																
OPTIN1	0000	0AF0	221*	357	940	1228	1241	1277	1759											
OPTIN2	0000	0AF6	224*	1739	1742															
OPTION	0000	187E	276	280	1439*															
OPTIONAD	0000	1CD8	1435	1710*																
OPTRTA	0000	0B9E	282*	1730																
OPTVAL	0000	1076	365	400	730*	1693														
OPTVAL0	0000	107C	732*	748																
OPTVAL1	0000	107E	733*	736																
OPTVAL2	0000	108A	734	738*																
OPTVAL3	0000	108E	740*	744																
OPTVAL4	0000	109C	742	745*																
ORIGIN1	0000	0A00	93	121*	123	125	5872	5902												
OSCT1	0000	21CC	2243*	2251																
OSCT2	0000	21D4	2246*	2254																
OSCT3	0000	21E2	2247	2250*																
OTC.0	0000	11E6	880*	885	854	856														
OTC.1	0000	11F2	884*																	
OTC.2	0000	11FC	883	887*																
OTC.3	0000	120E	890	893*																
OTC.4	0000	1226	500*	505																
OUSYS	0000	1712	433	435	1401*															
CUTO	0000	123E	881	898	501	903	910*													
OUT1	0000	1242	875	509	911*															
OUTBUF	0000	1872	1437*	1784																
CUTCHR	0000	11D4	226	228	287	292	304	309	312	331	336	596	784	837	847					
			856	860	871	875*	1688	1690												
			878	886	892	897*														
OUTCHR2	0000	121C																		
OUTSYS	0000	0D3E	432*																	
P1	0000	1156	821	824*																
P2	0000	117C	837*	839																
P3	0000	1188	825	842*																
P4	0000	1140	812	818*																
P5	0000	1148	814	817	820*															
PACTYP	0000	1776	1415*	1770	1846	4693														
PASFLG	0000	164E	193	200	550	1017	1028	1123	1341*											
PASLADR	0000	0A12	138*	150	818	982	1050													
PAUSE	0000	1246	183	875	884	891	895	912*												
PBLK01	0000	3D72	2094	4649	4751	5183	5763*													
PBLK02	0000	3D76	2095	2103	5766*															
PBLK03	0000	3D7A	2096	2104	2202	4754	4992	5765*												
PBLK04	0000	3D7E	2097	2105	2362	2363	2427	3094	3122	3192	3193	3203	3204	3863	4304					



CHKSUM/M17 PUNCHER

917	920	938	938	939	944	946	947	954	955	960	966	971
972	973	982	983	991	994	997	1001	1007	1008	1009	1015	1016
1020	1021	1026	1027	1030	1031	1032	1037	1038	1040	1042	1044	1047
1048	1050	1052	1053	1055	1056	1064	1064	1065	1071	1073	1108	1109
1141	1154	1161	1175	1178	1186	1216	1218	1272	1273	1314	1315	1316
1711	1732	1738	1740	1741	1745	1747	1806	1809	1812	1819	1823	1827
1836	1838	1839	1840	1841	1842	1920	1921	1922	1923	1925	1926	1945
1950	1981	1984	1989	1994	2004	2007	2008	2010	2012	2016	2017	2018
2019	2020	2044	2045	2048	2049	2051	2058	2099	2184	2187	2189	2190
2191	2195	2196	2290	2291	2365	2366	2370	2371	2373	2374	2376	2377
2378	2383	2384	2385	2390	2391	2392	2397	2398	2399	2404	2405	2406
2411	2412	2413	2417	2418	2419	2425	2514	2515	2517	2518	2532	2533
2542	2543	2544	2545	2545	2547	2562	2563	2577	2578	2589	2590	2658
2659	2660	2661	2664	2665	2666	2667	2672	2673	2678	2679	2680	2681
2691	2692	2698	2699	2747	2748	2750	2751	2753	2754	2762	2763	2767
2768	2769	2772	2773	2775	2776	2777	2778	2779	2786	2787	2791	2792
2794	2795	2850	2851	2852	2853	2854	2856	2857	2868	2922	2957	2991
2993	2997	2998	3000	3001	3009	3010	3020	3021	3113	3125	3126	3194
3209	3210	3211	3212	3219	3220	3221	3279	3280	3281	3284	3285	3289
3290	3291	3292	3293	3296	3348	3351	3352	3357	3358	3359	3361	3362
3364	3370	3374	3375	3418	3419	3423	3424	3430	3431	3432	3433	3434
3435	3436	3437	3442	3443	3444	3445	3446	3447	3448	3449	3452	3458
3495	3503	3504	3505	3548	3549	3554	3555	3599	3600	3603	3604	3606
3607	3608	3609	3645	3646	3647	3648	3689	3690	3692	3698	3757	3758
3759	3760	3767	3768	3772	3773	3774	3778	3781	3782	3784	3835	3836
3837	3841	3842	3843	3844	3845	3846	3848	3849	3854	3855	3858	3859
3860	3865	3866	3873	3874	3881	3882	3883	3930	3931	3933	3934	3936
3937	3939	3940	3941	3942	3953	3954	3956	3957	3967	3968	3970	3971
4014	4029	4081	4082	4084	4085	4090	4091	4099	4100	4102	4103	4113
4114	4120	4121	4128	4129	4133	4134	4135	4136	4136	4137	4195	4196
4203	4204	4213	4214	4220	4221	4223	4224	4225	4228	4231	4240	4241
4245	4246	4247	4249	4288	4289	4290	4291	4292	4293	4295	4296	4297
4298	4301	4302	4306	4362	4363	4364	4365	4366	4367	4368	4369	4371
4372	4374	4375	4376	4377	4382	4383	4386	4387	4389	4390	4393	4394
4396	4397	4400	4401	4403	4404	4418	4426	4448	4449	4453	4468	4471
4495	4501	4502	4508	4515	4518	4538	4543	4557	4562	4577	4585	4612
4613	4622	4623	4631	4632	4638	4639	4640	4642	4647	4648	4662	4664
4668	4692	4693	4738	4739	4739	4742	4762	4763	4773	4774	4793	4794
4816	4827	4835	4836	4837	4838	4838	4841	4848	4849	4850	4852	4860
4861	4866	4867	4868	4869	4871	4872	4873	4874	4875	4876	4877	4878
4879	4880	4893	4894	4898	4899	4905	4907	4911	4915	4923	4924	4927
4928	4963	4964	4980	4981	4981	4982	5020	5023	5024	5031	5032	5033
5036	5037	5039	5045	5077	5080	5081	5083	5091	5092	5096	5112	5113
5124	5125	5132	5133	5134	5135	5135	5140	5149	5150	5170	5171	5195
5196	5198	5199	5204	5206	5231	5233	5237	5238	5246	5287	5291	5292
5296	5297	5301	5302	5306	5307	5315	5316	5320	5321	5325	5326	5333
5335	5347	5348	5350	5351	5355	5356	5361	5362	5363	5367	5368	5370
5371	5379	5380	5383	5384	5386	5393	5394	5399	5407	5408	5414	5415
5416	5417	5418	5426	5427	5432	5433	5444	5458	5459	5460	5461	5465
5468	5469	5470	5472	5478	5479	5480	5487	5488	5496	5512	5513	5519
5520	5523	5526	5535	5537	5541	5542	5543	5550	5563	5564	5566	5579
5582	5595	5596	5614	5616	5617	5619	5628	5630	5632	5639	5643	5646
5649	5650	5672	5682	5683	5684	5686	5689	5865	5870	5886	5890	5896

CHKSUM/M17 PUNCHER

R1	0000 0001	5907	5908	5909	5915	5917	5918								
		68*	93	104	105	107	112	154	154	155	162	162	163	164	
		167	185	189	202	206	223	234	234	243	246	252	254	255	
		260	262	267	274	276	359	368	372	427	429	444	445	450	
		451	466	467	468	469	494	512	513	516	517	523	524	536	
		537	545	548	558	559	560	561	567	570	577	578	579	646	
		647	655	656	657	658	674	684	694	698	708	718	721	763	
		766	796	810	811	813	822	826	830	853	854	882	884	887	
		888	889	891	893	899	900	902	904	907	910	947	948	952	
		955	960	961	965	966	979	980	983	984	985	987	987	989	
		989	992	995	998	1001	1002	1008	1009	1010	1028	1049	1054	1057	
		1061	1061	1065	1066	1067	1070	1073	1074	1084	1106	1107	1107	1109	
		1110	1110	1112	1116	1142	1176	1179	1185	1310	1311	1668	1670	1674	
		1712	1718	1815	1817	1819	1820	1824	1832	1833	1877	1878	1880	1887	
		1891	1893	1914	1916	1917	1924	1925	1926	1927	1930	1931	1932	1932	
		1933	1935	1936	1937	1939	1940	1942	1945	1946	1954	1958	1959	1960	
		1982	1986	1987	1991	1992	1997	1999	2001	2002	2011	2012	2013	2515	
		2518	2526	2529	2530	2533	2541	2546	2547	2548	2554	2561	2563	2572	
		2573	2576	2578	2583	2584	3223	3224	3225	3226	3230	3236	3237	3349	
		3353	3358	3359	3370	3371	3372	3424	3426	3505	3555	3607	3691	3694	
		3695	3775	3776	3779	3783	3786	3787	3789	3790	3929	3931	3940	3961	
		3964	4012	4013	4020	4021	4023	4024	4114	4142	4145	4146	4148	4150	
		4198	4200	4214	4315	4318	4321	4322	4417	4422	4503	4505	4506	4507	
		4508	4514	4517	4519	4526	4529	4531	4539	4540	4543	4544	4545	4650	
		4651	4653	4659	4660	4823	4824	4825	4839	4840	4841	4842	4872	4873	
		4892	4896	4906	4907	4910	4914	4918	4976	4977	4978	4979	4982	4983	
		4984	5082	5087	5089	5154	5157	5193	5195	5205	5208	5209	5210	5212	
		5214	5230	5231	5232	5233	5235	5238	5288	5293	5298	5303	5308	5311	
		5314	5319	5324	5329	5332	5336	5343	5352	5356	5359	5365	5366	5367	
		5372	5375	5396	5397	5402	5403	5405	5409	5420	5421	5422	5423	5434	
		5435	5441	5442	5442	5443	5449	5450	5452	5453	5464	5465	5466	5466	
		5468	5471	5485	5487	5489	5497	5499	5500	5505	5506	5511	5516	5517	
		5524	5541	5546	5549	5565	5571	5578	5583	5586	5597	5601	5652	5653	
		5688	5689	5870	5872	5876	5878	5881	5882	5885	5885	5886	5893	5893	
		5895	5898	5902	5904	5907	5911								
R10	0000 000A	77*	1168	1168	1169	1188	1206	1207	1208	1234	1234	1235	1293	1293	
		1305	1306												
R11	0000 000B	78*	1939	1941	1945										
R12	0000 000C	79*	229	244	253	264	364	367	377	381	385	402	455	737	
		1673	1695	5364	5446	5474	5498	5545	5548	5552	5568	5573	5581	5585	
		5588	5599	5602											
R13	0000 000D	80*	5368	5476	5508	5554	5559	5575	5592	5606	5611				
R14	0000 000E	81*	283	319	365	368	370	400	405	409	746	749	755	1247	
		1267	1270	1286	1296	1301	1304	1306	1307	1693	1698	1702	1727	1852	
		1942	1943	2038	2200	2341	2379	2386	2393	2400	2407	2414	2420	2840	
		2847	2865	2869	2877	2880	3180	3187	3196	3205	3948	4242	4419	4428	
		4474	4645	4675	4677	4690	4721	4732	4743	4752	4756	4762	4764	4767	
		4773	4775	4793	4795	4799	4815	4818	4904	4909	4913	4917	4920	4932	
		4933	4996	4998	5034	5088	5230	5237	5239	5454	5463	5481			
R15	0000 000F	83*	215	235	370	376	380	384	425	434	437	440	440	442	
		503	553	631	731	732	733	735	739	740	784	875	963	968	
		970	1248	1268	1271	1287	1297	1302	1308	1681	1682	1686	1688	1690	
		1710	1714	1715	1717	1720	1722	1733	1734	1737	1744	1751	1752	1757	



## CHKSLM/M17 PUNCHER

		1759	1761	1763	1765	1767	1769	1771	1773	1775	1781	1783	1785	1788
		1798	1814	1938	1940	1943	2029	2030	2036	2042	2053	2055	2056	2057
		2155	2165	2171	2176	2181	2185	2188	2204	2235	2304	2340	2372	2375
		2381	2388	2395	2402	2409	2416	2421	2422	2426	2429	2430	2513	2525
		2537	2552	2558	2567	2663	2668	2669	2674	2675	2676	2684	2687	2693
		2701	2749	2755	2759	2859	2860	2867	2882	2596	3005	3012	3015	3018
		3025	3027	3029	3067	3082	3098	3112	3117	3127	3169	3172	3175	3176
		3185	3195	3227	3228	3241	3286	3307	3356	3422	3455	3502	3553	3605
		3650	3700	3705	3756	3764	3788	3791	3793	3795	3839	3840	3852	3861
		3862	3868	3870	3880	3884	3938	3944	3946	3955	3959	4019	4031	4083
		4104	4105	4106	4111	4112	4115	4123	4127	4131	4141	4197	4201	4206
		4207	4211	4212	4216	4232	4251	4254	4303	4310	4313	4324	4378	4381
		4395	4405	4406	4408	4464	4509	4521	4525	4527	4533	4534	4546	4586
		4587	4616	4617	4626	4634	4635	4636	4637	4656	4688	4689	4690	4691
		4723	4734	4740	4745	4817	4830	4843	4855	4855	4862	4863	4870	4900
		4913	4917	4920	4943	4958	5025	5026	5027	5028	5065	5070	5071	5115
		5116	5117	5117	5118	5126	5128	5138	5142	5143	5144	5151	5152	5160
		5161	5169	5181	5200	5226	5247	5265	5382	5424	5446	5448	5474	5498
		5515	5545	5548	5552	5562	5568	5570	5573	5581	5585	5588	5590	5599
		5602	5604	5633	5635	5640	5644	5647	5677	5681	5694	5852	5899	5912
		5919												
R2	0000 0002	65*	89	108	114	156	157	159	160	166	168	186	191	195
		203	207	222	223	280	281	285	285	286	288	289	295	298
		320	328	330	332	337	354	355	433	480	483	484	491	493
		494	455	496	498	504	505	514	515	516	562	563	566	568
		569	579	607	611	612	616	621	626	632	637	645	650	651
		675	685	655	695	705	719	722	764	776	777	775	781	785
		800	801	824	950	954	957	957	1062	1112	1114	1114	1115	1125
		1126	1131	1135	1143	1162	1163	1170	1184	1185	1187	1193	1253	1254
		1262	1263	1265	1273	1281	1282	1284	1294	1295	1299	1316	1713	1719
		1724	1725	1728	1729	1816	1817	1820	1823	1824	1952	1993	1996	1997
		3960	3962	3965	4314	4316	4319	4456	4504	4505	4506	4516	4517	4518
		4528	4529	4530	4540	4541	4542	4545	4768	4779	4782	4802	4828	4888
		4891	4894	4912	4916	4919	5153	5155	5158	5258	5262	5337	5344	5345
		5353	5354	5355	5403	5404	5405	5409	5425	5429	5430	5430	5431	5433
		5443	5445	5467	5470	5471	5473	5486	5488	5490	5491	5495	5500	5501
		5506	5518	5522	5524	5544	5547	5551	5567	5572	5580	5584	5587	5598
		5600	5653	5654	5656	5657	5873	5882	5884	5908				
R3	0000 0003	70*	94	95	194	196	261	261	265	265	271	282	295	320
		325	333	406	410	594	597	753	756	756	765	793	794	795
		797	802	836	838	1063	1068	1072	1075	1076	1079	1080	1090	1091
		1104	1105	1111	1115	1121	1126	1131	1132	1136	1162	1171	1699	1703
		1726	1893	1951	1952	4564	4572	4574	4581	4583	4584	5089	5094	5097
		5435	5436	5437	5439	5440	5441	5453	5494	5497	5502	5503	5530	5531
		5532	5874	5894	5903	5920	5921							
R4	0000 0004	71*	97	98	99	101	109	111	187	192	197	225	227	236
		238	239	241	248	250	254	286	291	296	297	300	303	308
		310	311	311	313	314	315	316	330	335	348	350	363	366
		385	411	426	427	438	595	733	741	745	747	780	781	782
		783	783	796	797	798	799	799	800	832	832	833	834	835
		846	848	852	857	855	870	506	516	517	920	928	929	1015
		1022	1077	1078	1082	1085	1101	1102	1103	1125	1128	1128	1138	1143
		1687	1689	1704	4558	4559	4563	4571	4575	5528	5534	5535	5537	5875



















CHKSUM/M17 PUNCHER

ZERO2	0000	13D2	1069*	1070						
ZERC3	0000	13E2	1073*	1074						
ZERCFILL	0000	324A	4538*	4617						
ZERCNE	0000	0CAE	37E*	1416	1426	1428	1430	1682	1744	

PROG= MSMTST ASSEMBLED BY CAL 03-066F04-01 (32-BIT)

000000I	1	* EDITED 062977	MST00010
000000I	2	NLSTC	MST00020
000000I	3	NOSQZ	MST00030
	4	IFNZ ADC-2	MST00040
	6	CROSS	MST00060
	7	NORX3	MST00070
	8	WIDTH 120	MST00080
	9	**	MST00090
	10	** MSM DISC TEST 06-200F02R01 (32-BIT)	MST00100
	11	* COPYRIGHT INTERDATA, INC. JUNE, 1977	MST00110
	12	*	MST00120
	13	* PROGRAM USES THE SERIES 32 INSTRUCTION SET	MST00130
	14	*	MST00140
	15	* THIS PROGRAM PROVIDES A COMPREHENSIVE TEST OF THE INTERDATA MSM	MST00150
	16	* FAMILY OF DISC DRIVES. FORMAT AND NORMAL MODE TESTING, SEEK	MST00160
	17	* INTERRUPT QUEUING, MULTIPLE-FILE DATA TRANSFERS, DUAL-PORT OPERATION,	MST00170
	18	* OFF-LINE READ/WRITE FORMAT, AND DEFECTIVE SECTOR ALTERNATION	MST00180
	19	* ARE SUPPORTED.	MST00190
	20	*	MST00200
	21	* THERE ARE 22 OPTIONS AVAILABLE TO THE USER, AND TWENTY ERROR	MST00210
	22	* MESSAGES TO AID IN THE ISOLATION OF A FAULT AT THE HARDWARE LEVEL.	MST00220
	23	*	MST00230
	24	* THE PROGRAM REQUIRES A 7/32, 8/32, OR EQUIVALENT PROCESSOR, WITH	MST00240
	25	* 32 K BYTES OF MEMORY. OPTIONS AND RUN COMMAND ARE TO BE ENTERED	MST00250
	26	* VIA A CONSOLE DEVICE. A SINGLE DISC SYSTEM CONTROLLER AND ITS	MST00260
	27	* ATTACHED DRIVES MAY BE TESTED AT ONE TIME.	MST00270
	28	*	MST00280
	29	* THE 06-200F02R01M17 TAPE IS ABSOLUTE WITH FRONT-END BOOT LOADER.	MST00290
	30	*	MST00300
	31	* ANY COMBINATION OF THE TESTS MAY BE SELECTED AS A STRING AND CAN	MST00310
	32	* BE RUN OR LOOPED CONTINUOUSLY.	MST00320
	62	ENDC	MST00620

		64	**ETPE						MST00640
		65	*						MST00650
		66	*						MST00660
	0000	0000	67	R0	EQU	0			MST00670
	0000	0001	68	R1	EQU	1			MST00680
	0000	0002	69	R2	EQU	2			MST00690
	0000	0003	70	R3	EQU	3			MST00700
	0000	0004	71	R4	EQU	4			MST00710
	0000	0005	72	R5	EQU	5			MST00720
	0000	0006	73	R6	EQU	6			MST00730
	0000	0007	74	R7	EQU	7			MST00740
	0000	0008	75	R8	EQU	8			MST00750
	0000	0009	76	R9	EQU	9			MST00760
	0000	000A	77	R10	EQU	10			MST00770
	0000	000B	78	R11	EQU	11			MST00780
	0000	000C	79	R12	EQU	12			MST00790
	0000	000D	80	R13	EQU	13			MST00800
	0000	000E	81	R14	EQU	14			MST00810
	0000	000E	82	RET	EQU	14			MST00820
	0000	000F	83	R15	EQU	15			MST00830
	0000	000F	84	LINK	EQU	15			MST00840
			85	*					MST00850
			86	*	BOOTLOADER WITH CHKSUM				MST00860
			87	*					MST00870
0000000I			88	ORG	X'80'				MST00880
000080	2421		89	LIS	R2,1				MST00890
000082	2303		90	BS	BOOT				MST00900
000084	3E58		91	DC	Z(PSWSAVE)		CURRENT PSW SAVE POINTER(32-BIT M/C)		MST00910
003086	3E60		92	DC	Z(RSAVE)		REGISTER SAVE POINTER(32-BIT M/C)		MST00920
000088	C810 0A00		93	BOOT	LHI R1,ORIGIN1		R1 = ADR( FIRST BYTE OF TEST PROG )		MST00930
00008C	C830 3E4B		94		LHI R3,LNZB		R3 = ADR( LAST NON-ZERO BYTE )		MST00940
000090	4030 0022		95		STH R3,X'22'		REG SAVE POINTER, 16-BIT MACHINE		MST00950
000094	C860 00FF		96	NN	LHI R6,X'00FF'		R6 = CHKSUM BYTE = X'MN'		MST00960
000098	D340 0078		97		LB R4,X'78'		INPUT DEV ADR		MST00970
00009C	DE40 0079		98		OC R4,X'79'				MST00980
0000A0	9D45		99	LEADER	SSR R4,R5				MST00990
0000A2	2091	100		BTBS	9,1		DU,BSY		MST01000
0000A4	9B45	101		RDR	R4,R5				MST01010
0000A6	0855	102		LDAR	R5,R5				MST01020
0000A8	2234	103		BZS	LEADER		IGNORE LEADER		MST01030
0000AA	D251 0000	104	LOAD	STB	R5,0(R1)		STORE 1ST NON-ZERO & SUBSEQUENT BYTE		MST01040
0000AE	D351 0000	105		LB	R5,0(R1)		RELOAD DATA BYTE TO		MST01050
0000B2	0765	106		XAR	R6,R5		GENERATE CHKSUM		MST01060
0000B4	9481	107		EXBR	R8,R1				MST01070
0000B6	9828	108		WHR	R2,R8		DISPLAY MEMORY ADDRESS		MST01080
0000B8	9D45	109		SSR	R4,R5				MST01090
0000BA	2091	110		BTBS	9,1		DU,BSY		MST01100
0000BC	9B45	111		RDR	R4,R5				MST01110
0000BE	C110 00AA	112		EXLE	R1,LOAD		LOAD TILL LAST BYTE		MST01120
0000C2	9486	113		EXBR	R8,R6				MST01130
0000C4	9828	114		WHR	R2,R8		FINAL CHKSUM		MST01140
0000C6	2478	115	LDWT	LIS	R7,8				MST01150
0000C8	117C	116		SLLS	R7,12		R7 = X'8200'		MST01160
0000CA	9557	117		EPSR	R5,R7		HALT PROCESSOR.		MST01170
0000CC	2203	118		BS	LD4T				MST01180

## EXEC - FTPE RO3P1 (W/CONDITIONAL ASSEMBLY)

0000CE		120	ORG	X'A00'		MST01200
	0000 0A00	121	ORIGIN1	EQU *		MST01210
		127		ELSE		MST01270
000A00	4300 0A2E	128	B	START1	START HERE FOR 32-BIT PROCESSOR	MST01280
000A04	4300 0A04	129	ORIGIN2	B ORIGIN2	INVALID ENTRY	MST01290
000A08	4300 0A4A	130	B	START3	SPECIAL 32-BIT ENTRY	MST01300
000A0C	4300 0A04	131	B	ORIGIN2	INVALID ENTRY	MST01310
000A10		132		ENDC		MST01320
		133	*			MST01330
		134	*	-----		MST01340
		135	*	TEST CONSTANTS	*	MST01350
		136	*			MST01360
000A10	0202	137	IO	DC X'0202'	I/O DEVICE(S) IDENTIFIER	MST01370
000A12	1011	138	PASLADR	DC X'1011'	PASLA/PALM READ/WRITE ADDRESSES	MST01380
000A14	0202	139	CLIFADR	DC X'0202'	CURRENT LOOP INTERFACE R/W ADDRESSES	MST01390
000A16	6262	140	LPADR	DC X'6262'	LINE PRINTER ADDRESS	MST01400
000A18	1011	141	C300ADR	DC X'1011'	CAROUSEL 320/PASLA ADDRESSES	MST01410
000A1A	0000	142		DCX 0	PROVISION FOR SPECIAL DEVICE	MST01420
000A1C	0140	143	TIME	DC X'140'	CONSTANT FOR 1 MS DELAY(X'C8'-MOD70)	MST01430
000A1E	0000	144		DCX 0	RESERVED	MST01440
000A20	30F0	145	PSW	DCX 30F0	PSW USED IN PROGRAM	MST01450
000A22	30F0	146	PSW2	DCX 30F0	PSW USED IN EXEC	MST01460
000A24	70F0	147	PSW3	DCX 70F0	ENABLE INTERRUPTS	MST01470
000A26	0000	148		DCX 0	RESERVED	MST01480
000A28	0000	149		DCX 0	RESERVED	MST01490
000A2A	0000	150		DCX 0	RESERVED	MST01500
000A2C	0000	151		DCX 0	RESERVED	MST01510
		152	*	-----		MST01520
		153	*			MST01530
000A2E	0711	154	START1	IAR R1,R1		MST01540
000A30	4010 0030	155		STH R1,X'30'	DISABLE INT AT PROCESSOR LEVEL	MST01550
000A34	4820 0A22	156		LH R2,PSW2		MST01560
000A38	4020 0032	157		STH R2,X'32'	SELECT REG SET 15	MST01570
		165		ENDC		MST01650
000A3C	C820 0A4E	166	ST	LHI R2,START		MST01660
000A40	4010 0034	167		STH R1,X'34'		MST01670
000A44	4020 0036	168		STH R2,X'36'	II INT NEW PSW LOC	MST01680
000A48	0000	169		DCX 0	TAKE AN ILLEGAL INSTRUCTION INT	MST01690
		170	*			MST01700
000A4A	4300 0A2E	171	START3	B START1	INSERT SPECIAL ROUTINE HERE	MST01710
		174		ENDC		MST01740
		175	*			MST01750
000A4E	41F0 131E	176	START	BAL LINK,SETKB	ESTABLISH KEYBOARD DEVICE	MST01760
000A52	9300	177		LBR R0,R0	TO TEST 'IO' BYTE	MST01770
000A54	2701	178		SIS R0,1	CRT ON PASLA ?	MST01780
000A56	4330 0A7A	179		BZ CRT	BRANCH IF YES.	MST01790
000A5A	2703	180		SIS R0,3	CAROUSEL ON PASLA ?	MST01800
000A5C	4200 0A5C	181		NOP *	PROVISION FOR SPECIAL KBD DEVICE	MST01810
000A60	4230 0A9A	182		BNZ TTY	BRANCH IF NO.	MST01820
000A64	40CC 1230	183	C300	STH R0,PAUSE	RESET TRANS PAUSE FLAG	MST01830
000A68	4800 0A19	184		LH R0,C300ADR	LOAD CAROUSEL/PASLA ADDRESSES	MST01840
000A6C	4810 15A8	185		LH R1,CARRD	CAROUSEL COMMANDS	MST01850
000A70	4820 15B0	186		LH R2,CAR2ND	PASLA/PALM FORMAT COMMAND	MST01860
000A74	D340 15A3	187		LB R4,CARRQ2S		MST01870

## EXEC - FTPE R03P1 (W/CONDITIONAL ASSEMBLY)

000A78	2309	188		BS	CRT2			MST01880
000A7A	4810 15A6	189	CRT	LH	R1,CRTRD	CRT/PASLA COMMANDS		MST01890
000A7E	48C0 0A12	190		LH	R0,PASLADR	LOAD PASLA ADDRESSES		MST01900
000A82	4820 15AE	191		LH	R2,CRT2ND	AND FORMAT COMMAND		MST01910
000A86	D340 15AA	192		LB	R4,CRTRQ2S			MST01920
000A8A	4000 159E	193	CRT2	STH	R0,PASFLG	SET 'CONSOLE ON PASLA' FLAG		MST01930
000A8E	9330	194		LBR	R3,R0			MST01940
000A90	9452	195		EXBR	R5,R2	POSITION 2ND CMD		MST01950
000A92	9E35	196		OCR	R3,R5	SET PASLA/PALM FORMAT		MST01960
000A94	D240 15AC	197		STB	R4,CONRQ2S			MST01970
000A98	23CA	198		BS	GOTIT			MST01980
000A9A	2400	199	TTY	LIS	R0,0			MST01990
000A9C	4000 159E	200		STH	R0,PASFLG	RESET 'CONSOLE ON PASLA' FLAG		MST02000
000AA0	4800 0A14	201		LH	R0,CLIFADR	LOAD CURRENT LOOP INTERFACE ADDRESS		MST02010
000AA4	4810 15B4	202		LH	R1,CLIFRD	AND COMMANDS		MST02020
000AA8	4820 15B6	203		LH	R2,CLIF2ND			MST02030
		204	*					MST02040
000AAC	4000 15A0	205	GOTIT	STH	R0,CONADR	CONSOLE DEVICE ADDRESSES		MST02050
000AB0	4010 15A2	206		STH	R1,CONRD	CONSOLE READ/WRITE COMMANDS		MST02060
000AB4	4020 15A4	207		STH	R2,CON2ND	AND FORMAT COMMAND (PASLA/PALM)		MST02070
000AB8	41F0 13A2	208		BAL	LINK,LCORE	SET UP LOW CORE		MST02080
000ABC	2400	209		LIS	R0,0			MST02090
000ABE	4000 15C2	210		STH	R0,WASDU	RESET 'DEVICE UNAVAILABLE' FLAG		MST02100
000AC2	4000 18BC	211		STH	R0,RFMTFLG	'FORMAT POT. DESTROYED' FLAG RESET**		MST02110
000AC6	41F0 11B0	212		BAL	LINK,CRLF			MST02120
000ACA	C850 1966	213		LHI	R5,TITLE			MST02130
000ACE	4050 15BC	214		STH	R5,ISITERR	FORCE PRINT	**	MST02140
000AD2	41F0 1110	215		BAL	R15,PRINT	PRINT TEST PROGRAM TITLE		MST02150
		216						MST02160
		217						MST02170
		218						MST02180
		219						MST02190
000AD6	0000 0AD6	220	OPTIN	EQU	*			MST02200
	41F0 11B0	221		BAL	LINK,CRLF	CR,LF TO LIST DEVICE		MST02210
	0000 0ADA	222	OPTIN1	EQU	*			MST02220
000ADA	4820 0A22	223		LH	R2,PSW2			MST02230
000ADE	9512	224		EPSR	R1,R2	NO INT. REG SET 15		MST02240
000AE0	41F0 131E	225	OPTIN2	BAL	LINK,SETKB	ESTABLISH CONSOLE		MST02250
000AE4	D340 169E	226		LB	R4,ANSG	OUTPUT AN * TO INDICATE	**	MST02260
000AEB	41F0 11BE	227		BAL	LINK,OUTCHR	COMMAND MODE ESTABLISHED		MST02270
000AEC	2541	228		LCS	R4,1	X'FF'		MST02280
000AEE	41F0 11BE	229		BAL	LINK,OUTCHR			MST02290
000AF2	C8C0 125A	230		LHI	R12,QUESTN	SET UP R12 FOR ERR ROUTINE		MST02300
000AF6	C800 2020	231		LHI	R0,X'2020'	BLANK OUT COMMAND BUFFER		MST02310
000AFA	4000 3E4C	232		STH	R0,OPTBUF	WHICH WILL CONTAIN OPTION		MST02320
000AFE	40C0 3E4E	233		STH	R0,OPTBUF+2	NAME		MST02330
000B02	4000 3E50	234		STH	R0,OPTBUF+4			MST02340
000B06	0711	235		XAR	R1,R1	CLEAR OPTBUF INDEX		MST02350
000B08	41F0 1232	236	RDCHR	BAL	R15,GETCHR	GET A CHAR IN R4		MST02360
000B0C	C540 0060	237		CLHI	R4,X'60'	UPPER CASE ALPHA ?		MST02370
000B10	2183	238		BLS	RDCHARO	BRANCH IF NO.		MST02380
000B12	CB40 0020	239		SHI	R4,X'20'	CONVERT TO LOWER CASE		MST02390
000B16	C540 0023	240	RDCHARO	CLHI	R4,X'23'	IS IT # ?		MST02400
000B1A	4330 0AD6	241		BE	OPTIN			MST02410
000B1E	C540 005F			CLHI	R4,X'5F'	LEFT ARROW, UNDERLINE CR DELETE ?		MST02410

## EXEC - FTPE R03P1 (W/CONDITIONAL ASSEMBLY)

000B22	2139	242	BNES	RDCHR1		MST02420
000B24	2711	243	SIS	R1,1	YES, DECREMENT INDEX	MST02430
000B26	021C	244	BMR	R12	BUFFER UNDERFLOW; PRINT '??'	MST02440
000B28	C800 0020	245	LHI	R0,X'20'		MST02450
000B2C	D201 3E4C	246	STB	R0,OPTBUF(R1)		MST02460
000B30	4300 0B08	247	B	RDCHR		MST02470
000B34	C540 000D	248	RDCHR1	CLHI R4,X'0D'	IS IT CR ?	MST02480
000B38	233C	249	BES	LOOKUP	YES, TRY MATCH	MST02490
000B3A	C540 0020	250	CLHI	R4,X'20'	IS IT A BLANK?	MST02500
000B3E	2339	251	BES	LOOKUP	YES, TRY MATCH	MST02510
000B40	C510 0006	252	CLHI	R1,6	7 CHARACTERS INPUT ?	MST02520
000B44	038C	253	BNLR	R12	IF YES, ERROR	MST02530
000B46	D241 3E4C	254	STB	R4,OPTBUF(R1)	STORE CURRENT BYTE	MST02540
000B4A	2611	255	AIS	R1,1	BUMP BUFFER INDEX	MST02550
000B4C	4300 0B08	256	B	RDCHR	READ NEXT CHARACTER	MST02560
		257	*-----*			MST02570
		258	* OPTION MATCH ROUTINE			MST02580
		259	*			MST02590
000B50	C810 16A0	260	LOOKUP	LHI R1,OPT	LOAD ADDRESS OF OPTION TABLE	MST02600
000B54	0733	261	LOOK1	XAR R3,R3	CLEAR BUFFER INDEX	MST02610
000B56	0861	262		LDAR R6,R1	SET OPTION WORD INDEX	MST02620
000B58	4856 0000	263	LOOK2	LH R5,0(R6)		MST02630
000B5C	021C	264		BMR R12	IF MINUS, THEN NO MATCH = ERROR	MST02640
000B5E	4553 3E4C	265		CLH R5,OPTBUF(R3)	COMPARE TO OPTBUF HW	MST02650
000B62	2333	266		BES LOOK3		MST02660
000B64	261C	267		AIS R1,12		MST02670
000B66	2209	268		BS LOOK1		MST02680
000B68	2632	269	LOOK3	AIS R3,2	TRY NEXT HW	MST02690
000B6A	2662	270		AIS R6,2		MST02700
000B6C	C530 0006	271		CLHI R3,6	3 MATCHING HW FOUND ?	MST02710
000B70	208C	272		BLS LOOK2		MST02720
		273	*			MST02730
000B72	C510 17E4	274		CLHI R1,RUN	RUN COMMAND ?	MST02740
000B76	4330 0D02	275		BE RUNIT		MST02750
000B7A	C510 17D8	276		CLHI R1,OPTION	OPTION CND ?	MST02760
000B7E	4230 0C74	277		BNE LOOK4	NO, LOOK FURTHER	MST02770
		278	*-----*			MST02780
		279	* TO PROCESS INPUT COMMAND 'OPTION'			MST02790
000B82	4820 17E0	280		LH R2,OPTION+8	CHECK FOR SPECIAL ROUTINE	MST02800
000B86	0232	281		BNZR R2	LINK TO ROUTINE	MST02810
000B88	C830 16A0	282	OPTRTN	LHI R3,TEST	RETURN HERE	MST02820
000B8C	C8E0 0C12	283		LHI R14,OPTCMD8		MST02830
000B90	41F0 11B0	284		BAL LINK,CRLF		MST02840
000B94	0722	285	OPTCMD	XAR R2,R2	RESET COUNTER	MST02850
000B96	D342 16A0	286	OPTCMD1	LB R4,OPT(R2)	TO PRINT TEST	MST02860
000B9A	41F0 11BE	287		BAL LINK,OUTCHR		MST02870
000B9E	2621	288		AIS R2,1		MST02880
000BA0	C520 0006	289		CLHI R2,6		MST02890
000BA4	2087	290		BLS OPTCMD1		MST02900
000BA6	C840 0020	291		LHI R4,C'		MST02910
000BAA	41F0 11BE	292		BAL LINK,OUTCHR	OUTPUT 1 SPACE	MST02920
000BAE	0755	293		XAR R5,R5	TO PRINT SELECTED TEST NUMBERS	MST02930
000BB0	4050 1584	294		STH R5,FIRST		MST02940
000BB4	4823 0006	295		LH R2,6(R3)	FIRST TEST WORD	MST02950

## EXEC - LTPF R03P1 (W/CONDITIONAL ASSEMBLY)

000BB8	2440	296	OPTCMD2	LIS	R4,0	START WITH TEST 0	MST02960	
000BBA	4040 3E54	297		STH	R4,TEMP		MST02970	
000BBE	9121	298	OPTCMD3	SLHLS	R2,1		MST02980	
000BC0	4380 0BF2	299		BNC	OPTCMD7		MST02990	
000BC4	4040 3E54	300	OPTCMD4	STH	R4,TEMP	OPTION VALUE FOUND.	MST03000	
000BC8	4800 1584	301		LH	R0,FIRST	IS IT FIRST ?	MST03010	
000BCC	2335	302		BZS	OPTCMD5		MST03020	
000BCE	C840 002C	303		LHI	R4,C','	NO, OUTPUT COMMA	MST03030	
000BD2	41F0 11BE	304		BAL	LINK,OUTCHR		MST03040	
000BD6	40F0 1584	305	OPTCMD5	STH	LINK,FIRST		MST03050	
000BDA	0855	306		LDAR	R5,R5	TEST VALUE FROM SECOND HW	MST03060	
000BDC	2335	307		BZS	OPTCMD6	NO	MST03070	
000BDE	C840 0031	308		LHI	R4,C'1'	YES,OUTPUT '1'	MST03080	
000BE2	41F0 11BE	309		BAL	LINK,OUTCHR		MST03090	
000BE6	4840 3E54	310	OPTCMD6	LH	R4,TEMP	RESTORE R4	MST03100	
000BEA	D344 15E4	311		LB	R4,HEXTAB(R4)	CONVERT	MST03110	
000BEE	41F0 11BE	312		BAL	LINK,OUTCHR	OUTPUT 0-F	MST03120	
000BF2	4840 3E54	313	OPTCMD7	LH	R4,TEMP	RESTORE	MST03130	
000BF6	2641	314		AIS	R4,1	INCREMENT TEST #	MST03140	
000BF8	4040 3E54	315		STH	R4,TEMP		MST03150	
000BFC	C540 0010	316		CLHI	R4,16		MST03160	
000C00	4280 0BBE	317		BL	OPTCMD3		MST03170	
000C04	0855	318	OPTCMD71	LDAR	R5,R5	DONE ?	MST03180	
000C06	023E	319		BNZR	R14		MST03190	
000C08	4823 0008	320		LH	R2,8(R3)	SECOND TEST WORD	MST03200	
000C0C	2451	321		LIS	R5,1	R5 = 1 FOR SECOND TEST HW	MST03210	
000C0E	4300 0BB8	322		B	OPTCMD2		MST03220	
		323	*-----*					MST03230
		324	* TO OUTPUT OTHER OPTION NAMES & VALUES					MST03240
		325	*					MST03250
000C12	41F0 11B0	326	OPTCMD8	BAL	LINK,CRLF		MST03260	
000C16	2461	327		LIS	R6,1	SET LINE COUNTER	MST03270	
000C18	C820 16AC	328		LHI	R2,OPT+12	R2 POINTS TO THE NAME	MST03280	
000C1C	2436	329	OPTCMD9	LIS	R3,6		MST03290	
000C1E	D342 0000	330	OPTCMD10	LB	R4,0(R2)		MST03300	
000C22	41F0 11BE	331		BAL	LINK,OUTCHR	OUTPUT OPTION NAME CHAR	MST03310	
000C26	2621	332		AIS	R2,1		MST03320	
000C28	2731	333		SIS	R3,1	6 CHARACTERS OUTPUT ?	MST03330	
000C2A	2026	334		BPS	OPTCMD10	NO,LOOP	MST03340	
000C2C	C840 0020	335		LHI	R4,C' '		MST03350	
000C30	41F0 11BE	336		BAL	LINK,OUTCHR	OUTPUT ONE SPACE	MST03360	
000C34	4852 0000	337		LH	R5,0(R2)	R5 = OPTION VALUE	MST03370	
000C38	24C4	338		LIS	R0,4		MST03380	
000C3A	41F0 10BE	339		BAL	LINK,R5HEX	WRITE OPTION VALUE IN HEX (4 DIGITS)	MST03390	
000C3E	D300 0A10	340		LB	R0,10		MST03400	
000C42	2701	341		SIS	R0,1	CONSOLE = CRT ?	MST03410	
000C44	213D	342		BNZS	OPTCMD12	BRANCH: NO.	MST03420	
000C46	2661	343		AIS	R6,1	INCREMENT LINE COUNTER.	MST03430	
000C48	C560 0014	344		CLHI	R6,20	PAGE FULL ?	MST03440	
000C4C	2189	345		BLS	OPTCMD12	NO	MST03450	
000C4E	0766	346		XAR	R5,R5	INITIALIZE LINE COUNT	MST03460	
000C50	41F0 1232	347	OPTCMD11	BAL	LINK,GETCHR		MST03470	
000C54	274D	348		SIS	R4,13	CF ?	MST03480	
000C56	4330 0AD6	349		BZ	OPTIN	TO ACCEPT NEXT COMMAND	MST03490	



## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

000C5A	2643	350		AIS	R4,3	LF ?	MST03500
000C5C	2036	351		BNZS	OPTCMD11	IF YES, PRINT NEXT PAGE	MST03510
000C5E	41F0 11B0	352	OPTCMD12	BAL	LINK,CRLF		MST03520
000C62	41F0 1274	353		BAL	LINK,TSTBRK	EXIT IF 'BREAK' PRESSED.	MST03530
000C66	2626	354		AIS	R2,6		MST03540
000C68	C520 17B4	355		CLHI	R2,OPTEND2	ALL PRINTING OPTIONS DCNE ?	MST03550
000C6C	4280 0C1C	356		BL	OPTCMD9	NO,LOOP FOR NEXT ONE	MST03560
000C70	4300 0ADA	357		B	OPTIN1	TO ACCEPT NEXT COMMAND	MST03570
		358					MST03580
000C74	C510 16A0	359	LOOK4	CLHI	R1,TEST	'TEST' OPTION ?	MST03590
000C78	4330 0C80	360		BE	TESTOP		MST03600
		361	*		TO PROCESS COMMANDS OTHER THAN 'TEST', 'OPTION'.		MST03610
		362	*				MST03620
000C7C	274D	363		SIS	R4,13	OPT FOLLOWED BY CR ?	MST03630
000C7E	033C	364		BZR	R12	YES, ERROR	MST03640
000C80	41E0 1060	365		BAL	R14,OPTVAL	GET OPTION VALUE IN R6	MST03650
000C84	274D	366		SIS	R4,13	TERMINATED BY CR ?	MST03660
000C86	023C	367		BNZR	R12	IF NO, BRANCH	MST03670
000C88	48E1 0008	368		LH	R14,8(R1)	GET OPTION CHECK ROUTINE ADDRESS	MST03680
000C8C	2332	369		BZS	LOOK5		MST03690
000C8E	01FE	370		BALR	R15,R14	LINK OPTION CHECK ROUTINE	MST03700
	0000 0C90	371	LOOK5	EQU	*	RETURN HERE	MST03710
000C90	4061 0006	372		STH	R6,6(R1)	STORE OPTION VALUE	MST03720
000C94	4300 0AD6	373		B	OPTIN	TO ACCEPT NEXT COMMAND	MST03730
		374	*				MST03740
000C98	C360 FFFE	375	ZERONE	THI	R6,X'FFFE'	IGNORE LSB	MST03750
000C9C	033F	376		BZR	R15	OKAY	MST03760
000C9E	030C	377		BR	R12	ERROR RETURN	MST03770
		378	*				MST03780
000CA0	C560 0400	379	ADR	CLHI	R6,X'400'	(R6) = 10 BIT DEVICE ADDRESS	MST03790
000CA4	028F	380		BLR	R15	RETURN TO LOOK5	MST03800
000CA6	030C	381		BR	R12		MST03810
		382	*				MST03820
000CA8	C560 000F	383	LEVEL	CLHI	R6,15	(R6) = INTERRUPT LEVEL HEX DIGIT	MST03830
000CAC	028F	384		BLR	R15	RETURN TO LOOK5	MST03840
000CAE	030C	385		BR	R12		MST03850
		386					MST03860
		387	*		TEST OPTION PROCESS ROUTINE		MST03870
		388	*				MST03880
000CB0	274D	389	TESTOP	SIS	R4,13	'TEST' FOLLOWED BY (CR) ?	MST03890
000CB2	213B	390		BNZS	TSTOP1		MST03900
000CB4	4800 1814	391		LH	R0,DEFTSTS	YES, SET TEST OPTION TO	MST03910
000CB8	4000 16A6	392		STH	R0,TEST+6	FIRST TEST WORD	MST03920
000CBC	4800 1816	393		LH	R0,DEFTSTS+2	ALL DEFAULT TESTS IN PROGRAM	MST03930
000CC0	4000 16A8	394		STH	R0,TEST+8	SECOND TEST WORD	MST03940
000CC4	4300 0AD6	395		B	OPTIN	TO ACCEPT NEXT COMMAND	MST03950
		396	*				MST03960
000CC8	48E0 188C	397	TSTOP1	LH	R5,MAXTST		MST03970
000CCC	2470	398		LIS	R7,0	TEST BIT ACCUMULATORS	MST03980
000CCE	2480	399		LIS	R8,0		MST03990
000CD0	41E0 1060	400	TSTOP2	BAL	R14,OPTVAL	GET OPTION VALUE IN R6	MST04000
000CD4	0556	401		CLAR	R5,R6		MST04010
000CD6	026C	402		BLR	R12	ERROR: INVALID TEST NUMBER	MST04020
000CD8	C560 0010	403		CLHI	R6,16	R6 < 16 ?	MST04030

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

000CDC	2385	404	BNLS	TSTOP3	NO	MST04040
000CDE	41E0 1096	405	BAL	R14,UNARY	GET UNARY OPERAND IN R3	MST04050
000CE2	0673	406	CAR	R7,R3	SET CURRENT BIT	MST04060
000CE4	2306	407	BS	TSTOP4		MST04070
000CE6	CB60 0010	408	TSTOP3	SHI	R6,16	MST04080
000CEA	41E0 1096	409	BAL	R14,UNARY	R6 = 0-F	MST04090
000CEE	0683	410	CAR	R8,R3	SET CURRENT BIT	MST04100
000CF0	274D	411	TSTOP4	SIS	R4,13	MST04110
000CF2	4230 0CDO	412	BNZ	TSTOP2	TERMINATED BY CR ?	MST04120
000CF6	4070 16A6	413	STH	R7,TEST+6	STORE VALID SELECTED TESTS	MST04130
000CFA	4080 16A8	414	STH	R8,TEST+8	TO ACCEPT NEXT COMMAND	MST04140
000CFE	4300 0AD6	415	B	OPTIN		MST04150
		416	-----			MST04160
		417	*			MST04170
		418	RUNIT	EQU	*	MST04180
		419	BAL	LINK,CRLF		MST04190
		420	LH	RO,IO		MST04200
000D02	0000 0DD2	421	STH	RO,IOSAVE	RESTORE USER'S I/O CHOICE	MST04210
000D06	41F0 11B0	422	BAL	LINK,CRLF		MST04220
000D0A	4000 3E52	423	BAL	LINK,INIT	LINK USER INITIALIZATION ROUTINE	MST04230
000D0E	41F0 11B0	424	BAL	LINK,INIT	RETURN HERE	MST04240
000D12	41F0 1DBC	425	INITRET	EQU	*	MST04250
	0000 0D16	426	LIS	R15,0		** MST04260
000D16	24F0	427	LIS	R4,0	CHECK DEVSADR FALSE SYNC	** MST04270
000D1A	4814 17F4	428	LH	R1,DEVSADR(R4)		** MST04280
000D1E	4210 0D44	429	BR	KEEPO	END OF TABLE	** MST04290
000D22	9B10	430	SSR	R1,RO		** MST04300
000D24	2704	431	SIS	RO,4	FALSE SYNC ?	** MST04310
000D26	213C	432	BNZS	INSYS		** MST04320
000D28	2403	433	OUTSYS	LIS	RO,3	** MST04330
000D2A	C920 1670	434	LHI	R2,OUTSYS+4		** MST04340
000D2E	41F0 10E8	435	BAL	R15,HEIASC		** MST04350
000D32	C850 166C	436	LHI	R5,OUTSYS		** MST04360
000D36	4050 15BC	437	STH	R5,ISITERR		** MST04370
000D3A	41F0 1110	438	BAL	R15,PRINT	'DEV *** FALSE SYNC'	** MST04380
000D3E	2642	439	INSYS	AIS	R4,2	** MST04390
000D40	4300 0D1A	440	B	INITRET+4		** MST04400
000D44	08FF	441	KEEPO	LDAR	R15,R15	** MST04410
000D46	4230 0AD6	442	BNZ	OPTIN		** MST04420
000D4A	40F0 15C4	443	STH	R15,WASDU1		MST04430
000D4E	240F	444	LIS	RO,15	TO FIND HIGHEST SELECTED TEST NO.	MST04440
000D50	4810 16A8	445	LH	R1,TEST+8	CHECK SECOND TEST HW	MST04450
000D54	1011	446	KEEP1	SRLS	R1,1	MST04460
000D56	218B	447	BCS	FOUND1	RO = F-0	MST04470
000D58	2701	448	SIS	RO,1	TRY NEXT DIGIT	MST04480
000D5A	2213	449	BNMS	KEEP1	INITIALIZE AGAIN	MST04490
000D5C	240F	450	LIS	RO,15	CHECK FIRST TEST HW	MST04500
000D5E	4810 16A6	451	LH	R1,TEST+6		MST04510
000D62	1011	452	KEEP2	SRLS	R1,1	MST04520
000D64	2186	453	BCS	FOUND1+4	RO = F-0 = TEST #	MST04530
000D66	2701	454	SIS	RO,1		MST04540
000D68	2213	455	BNMS	KEEP2	LOOP	MST04550
000D6A	030C	456	BR	R12	TEST NOT SELECTED	MST04560
000D6C	CA00 0010	457	FOUND1	AHI	ADJUST TEST # FOR SECOND HW	MST04570
000D70	4000 15C0		STH	RO,SELTST	HIGHEST SELECTED TEST NUMBER	MST04580

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		458	*						MST04530
		459	*	RESET TEST PARAMETERS					MST04590
		460	*						MST04500
000D74	0700	461		XAR	RO,RO				MST04510
000D76	4000 15BC	462		STH	RO,ISITERR	RESET ERROR FLAG			MST04520
000D7A	4000 15C6	463		STH	RO,TOTAL	RESET TOTAL			MST04630
000D7E	4000 15C8	464		STH	RO,TOTERR	RESET TOTERR			MST04640
000D82	4000 15C2	465		STH	RO,WASDU	RESET WASDU			MST04650
000D86	C810 3030	466		LHI	R1,C'00'				MST04660
000D8A	4010 15FA	467		STH	R1,MTESTNO	RESET THESE FLAGS TO C'00'			MST04670
000D8E	4010 1604	468		STH	R1,ETESTNO				MST04680
000D92	4010 1606	469		STH	R1,ERRNO				MST04690
000D96	41F0 13A2	470		BAL	LINK,LCORE	SET UP LOW CORE			MST04700
		471	*						MST04710
		472	*	START SELECTION FROM TEST 0					MST04720
		473	*						MST04730
000D9A	0700	474	KEEP3	XAR	RO,RO				MST04740
000D9C	4000 15CA	475		STH	RO,BTESTNO	RESET BINARY TEST NUMBER			MST04750
000DA0	4000 15CE	476		STH	RO,NEXTST	RESET NEXT TEST #			MST04760
		477	*						MST04770
		478	*	TO FIND THE NEXT SELECTED TEST.					MST04780
		479	*						MST04790
000DA4	4820 15CE	480	KEEP4	LH	R2,NEXTST	GET NEXT TEST #			MST04800
000DA8	2408	481	KEEP41	LIS	RO,8				MST04810
000DAA	910C	482		SRHLS	RO,12	RO = X'8000'			MST04820
000DAC	CC02 0000	483		SRHL	RO,0(R2)	RO = NEXT TEST BIT			MST04830
000DB0	C520 0010	484		CLHI	R2,X'10'	NEXT TEST < 16			MST04840
000DB4	2185	485		BLS	KEEP42				MST04850
000DB6	4400 16A8	486		NH	RO,TEST+8	LOOK AT TEST HW 2			MST04860
000DBA	2137	487		BNZS	KEEP5				MST04870
000DBC	2304	488		BS	KEEP43				MST04880
000DBE	4400 16A6	489	KEEP42	NH	RO,TEST+6	LOOK AT TEST HW 1			MST04890
000DC2	2133	490		BNZS	KEEP5				MST04900
000DC4	2621	491	KEEP43	AIS	R2,1				MST04910
000DC6	220F	492		BS	KEEP41	LOOP FOR NEXT TEST #			MST04920
000DC8	4020 15CA	493	KEEP5	STH	R2,BTESTNO	CURRENT TEST #			MST04930
000DCC	0812	494		LDAR	R1,R2	R1 = TEST # IN BINARY			MST04940
000DCE	2621	495		AIS	R2,1				MST04950
000DD0	4020 15CE	496		STH	R2,NEXTST				MST04960
000DD4	2402	497		LIS	RO,2	SET DIGITS TO PRINT = 2			MST04970
000DD6	C820 15FA	498		LHI	R2,MTESTNO	R2 = A(MTESTNO)			MST04980
000DDA	41F0 10E8	499		BAL	LINK,HEXASC	STORE TEST # IN ASCII @ MTESTNO			MST04990
000DDE	C800 0100	500		LHI	RO,X'0100'	TEST 17 MASK	**		MST05000
000DE2	4400 16A8	501		NH	RO,TEST+8	IS IT SELECTED ?	**		MST05010
000DE6	2133	502		BNZS	KEEP5A	BRANCH: YES.	**		MST05020
000DE8	41F0 1CEA	503		BAL	R15,RFWTCK	CHECK IF RE-FORMAT REQ'D.	**		MST05030
000DEC	4820 15FA	504	KEEP5A	LH	R2,MTESTNO				MST05040
000DF0	4020 1604	505		STH	R2,ETESTNO	STORE TEST # IN ASCII @ ETESTNO			MST05050
000DF4	41F0 1274	506		BAL	LINK,TSTBRK	TEST BREAK			MST05060
000DF8	C850 15F4	507		LHI	R5,TSTMSG				MST05070
000DFC	41F0 1110	508		BAL	LINK,PRINT	PRINT 'TEST NN'			MST05080
000E00	0700	509		XAR	RO,RO				MST05090
000E02	4000 15BE	510		STH	RO,NOERR	RESET ERROR FLAG			MST05100
000E06	4000 15CC	511		STH	RO,COUNT	RESET COUNT			MST05110

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000E0A	4810	0A20	512	KEEP6	LH	R1,PSW	ENABLE INTERRUPTS	MST05120
000E0E	95C1		513		EPSR	RO,R1		MST05130
000E10	4820	15CA	514		LH	R2,BTESTNO	R2 = TEST #	MST05140
000E14	1122		515		SLLS	R2,LADC		MST05150
000E16	5812	1818	516		LDA	R1,TESTS(R2)		MST05160
000E1A	0301		517		BR	R1	GO TO TEST MODULE	MST05170
			518		-----			
			519	*				
			520	*	TEST MODULE END ROUTINE			
			521	*				
	0000	0E1C	522	TSTEND	EQU	*		MST05220
000E1C	4810	0A22	523		LH	R1,PSW2		MST05230
000E20	9501		524		EPSR	RO,R1	DISABLE INT & PROCESSOR LEVEL	MST05240
000E22	4800	15CC	525		LH	RO,COUNT		MST05250
000E26	2601		526		AIS	RO,1	INCREMENT COUNT	MST05260
000E28	4000	15CC	527		STH	RO,COUNT		MST05270
000E2C	4500	177E	528		CLH	RO,LOOP+6	IF COUNT > LOOP,	MST05280
000E30	2385		529		BWLS	KEEP7	GO TO NEXT TEST MODULE	MST05290
000E32	41F0	1274	530		BAL	LINK,TSTBRK	IF BREAK GO TO OPTIN	MST05300
000E36	4300	0E0A	531		B	KEEP6	OTHERWISE, REPEAT SAME TEST	MST05310
000E38	4800	158E	532	KEEP7	LH	RO,ROERR	LOOK & ERROR FLAG	MST05320
000E3E	2135		533		BWLS	KEEP7		MST05330
000E40	C950	161A	534		LHI	R5,ROERRSG		MST05340
000E44	41F0	1110	535		BAL	LINK,PRINT	PRINT "NO ERROR"	MST05350
000E48	4810	15CA	536	KEEP7	LH	R1,BTESTNO	GET TEST #	MST05360
000E4C	4510	15C0	537		CLH	R1,SELST	IS THE LAST SELECTED TEST DONE ?	MST05370
000E50	4280	0DA4	538		BL	KEEP4	NO, GO SELECT NEXT TEST	MST05380
			539	*				
			540	*	ALL THE SELECTED TESTS ARE NOW RUN			
			541	*				
	0000	0E5A	542	ABORT	EQU	*	COME HERE TO ABORT TEST SEQUENCE.	MST05420
000E54	41F0	12B8	543		BAL	LINK,TSTDU	RETURN WITH R1 = DU BIT	MST05430
000E58	4230	0E5A	544		BWZ	KEEP9	IF DU, DISPLAY TOTAL	MST05440
000E5C	4810	15C4	545		LH	R1,WASDU1	WAS IT EVER ?	MST05450
000E60	4230	0ECC	546		BWZ	KEEP10	YES, PRINT TOTAL, TOTERR	MST05460
000E64	41F0	1274	547		BAL	LINK,TSTBRK		MST05470
000E68	4810	178A	548		LH	R1,CONTIN+6	IF CONTIN = 1,	MST05480
000E6C	4230	0D9A	549		BWZ	KEEP3	GO TO TEST 0	MST05490
000E70	41F0	131E	550		BAL	LINK,SETKB	KB DEVICE = LIST DEVICE	MST05500
000E74	C850	168E	551		LHI	R5,EOTMSG		MST05510
000E78	41F0	1110	552		BAL	LINK,PRINT	'END OF TEST'	MST05520
000E7C	41F0	1CEA	553		BAL	R15,RFMTCK	CHECK IF REFORMAT NECESSARY	MST05530
000E80	4300	0AD6	554		B	OPTIN	**	MST05540
			555		-----			
			556	*	ROUTINE INCREMENTS, DISPLAYS & CHECKS 'TOTAL'			
			557	*				
000E84	4010	15C2	558	KEEP9	STH	R1,WASDU	SET 'WASDU' FLAG	MST05580
000E88	4810	15C6	559		LH	R1,TOTAL	INCREMENT TOTAL	MST05590
000E8C	2611		560		AIS	R1,1		MST05600
000E8E	4010	15C6	561		STH	R1,TOTAL		MST05610
000E92	2421		562	KEEP9	LIS	R2,1		MST05620
000E94	DE20	159D	563		OC	R2,INCR	DISPLAY: INCREMENTAL MODE	MST05630
000E98	4800	15C8	564		LH	RO,TOTERR		MST05640
000E9C	9400		565		EXBR	RO,RO		MST05650

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000E9E	9820	566	WHR	R2,R0	DISPLAY TOTERR	MST05660
000EA0	9401	567	EXBR	RO,R1	FORMAT FOR DISPLAY	MST05670
000EA2	9820	568	WHR	R2,R0	DISPLAY TOTAL	MST05680
000EA4	DE20 159C	569	OC	R2,NORM	DISPLAY: NORMAL MODE	MST05690
000EA8	C510 7FFF	570	CLHI	R1,X'7FFF'	TOTAL < MAX RETAINABLE ?	MST05700
000EAC	2389	571	BNLS	HALT9		MST05710
000EAE	4800 15CA	572	LH	RO,BTESTNO	RO = CURRENT TEST #	MST05720
000EB2	4500 15C0	573	CLH	RO,SELTST	IS IT LAST TEST ?	MST05730
000EB6	4280 0DA4	574	BL	KEEP4	NO, GO TO NEXT TEST	MST05740
000EBA	4300 0D9A	575	B	KEEP3	GO TO TEST 0	MST05750
		576	*			MST05760
000EBE	C810 080F	577	HALT9	LHI R1,X'80F'		MST05770
000EC2	9114	578	SLHLS	R1,4	(R1) = X'80F0'	MST05780
000EC4	9521	579	EPSR	R2,R1	HALT PROCESSOR	MST05790
		580	*			MST05800
		581	*	WHEN EXE/RUN IS PRESSED, PRINT TOTAL & TOTERR		MST05810
		582	*			MST05820
000EC6	41F0 12D8	583	BAL	LINK,TSTDU	SEE IF LIST DEV IS ON	MST05830
000ECA	2036	584	BNZS	HALT9	NO, HALT	MST05840
000ECC	0700	585	KEEP10	XAR RO,R0		MST05850
000ECE	4000 15C2	586	STH	RO,WASDU	RESET FLAG	MST05860
000ED2	41F0 11B0	587	BAL	LINK,CRLF		MST05870
000ED6	C850 160A	588	LHI	R5,TOTMSG		MST05880
000EDA	4050 15BC	589	STH	R5,ISITERR		MST05890
000EDE	41F0 1110	590	BAL	LINK,PRINT	PRINT 'TOTAL TOTERR'	MST05900
000EE2	2404	591	LIS	RO,4	TO PRINT 4 HEX DIGITS	MST05910
000EE4	4850 15C6	592	LH	R5,TOTAL		MST05920
000EE8	41F0 10BE	593	BAL	LINK,R5HEX	PRINT TOTAL IN HEX	MST05930
000EEC	2434	594	LIS	R3,4		MST05940
000EEE	C840 0020	595	LHI	R4,C'	SPACE	MST05950
000EF2	41F0 11BE	596	KEEP101	BAL LINK,OUTCHR	OUTPUT IT	MST05960
000EF6	2731	597	SIS	R3,1		MST05970
000EF8	2023	598	BPS	KEEP101	4 TIMES	MST05980
000EFA	2404	599	LIS	RO,4	TO PRINT 4 HEX DIGITS	MST05990
000EFC	4850 15C8	600	LH	R5,TOTERR		MST06000
000F00	41F0 10BE	601	BAL	LINK,R5HEX	PRINT TOTERR IN HEX	MST06010
000F04	4300 0AD6	602	B	OPTIN	GO TO BEGINNING	MST06020
		603	*	*****		MST06030
		604	*	ERROR ROUTINES	(OVERRIDE NONMSG OPTION)	MST06040
		605	*			MST06050
000F08	D000 3F20	606	ERR	STM RO,ERRSAVE	STORE REGISTERS	MST06060
000F0C	4120 0F92	607	BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS ON	MST06070
000F10	41E0 0FC4	608	BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06080
000F14	0700	609	ERRCOM2	XAR RO,R0		MST06090
000F16	4000 15BC	610	STH	RO,ISITERR	RESET ERROR FLAG	MST06100
000F1A	4820 0A20	611	LH	R2,PSW		MST06110
000F1E	9502	612	EPSR	RO,R2		MST06120
000F20	D100 3F20	613	LM	RO,ERRSAVE	RESTORE REGISTERS	MST06130
000F24	03CF	614	BR	LINK	RETURN TO TEST	MST06140
000F26	D000 3F20	615	ERRD	STM RO,ERRSAVE	STORE REGISTERS	MST06150
000F2A	4120 0F92	616	BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS ON	MST06160
000F2E	41E0 0FC4	617	BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06170
000F32	41E0 0FC4	618	BAL	RET,ERRD1	PRINT 'DEV DDD'	MST06180
000F36	4300 0F14	619	B	ERRCOM2		MST06190

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000F3A	D0CC 3F20	620	ERRS	STM	RO,ERRSAVE	STORE REGISTERS	MST06200
000F3E	4120 0F92	621		BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS ON	MST06210
000F42	41E0 OFC4	622		BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06220
000F46	41E0 OFE6	623		BAL	RET,ERRS1	PRINT 'STA SS'	MST06230
000F4A	4300 0F14	624		B	ERRCOM2		MST06240
000F4E	D0C0 3F20	625	ERRDS	STM	RO,ERRSAVE	STORE REGISTERS	MST06250
000F52	4120 0F92	626		BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS ON	MST06260
000F56	41E0 OFC4	627		BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06270
000F5A	41E0 OFFE	628		BAL	RET,ERRDS1	PRINT 'DEV DDD STA SS'	MST06280
000F5E	4300 0F14	629		B	ERRCOM2		MST06290
000F62	D000 3F20	630	ERRL	STM	RO,ERRSAVE	STORE REGISTERS	MST06300
000F66	40F0 1596	631		STH	R15,OLOC	STORE ERROR LOC TO PRINT	MST06310
000F6A	4120 0F92	632		BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS ON	MST06320
000F6E	41E0 OFC4	633		BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06330
000F72	41E0 1024	634		BAL	RET,ERRL1	PRINT 'LOC LLL'	MST06340
000F76	4300 0F14	635		B	ERRCOM2		MST06350
000F7A	D000 3F20	636	ERRALL	STM	RO,ERRSAVE	STORE REGISTERS	MST06360
000F7E	4120 0F92	637		BAL	R2,ERRCOM	RETURN IF LIST DEVICE IS ON	MST06370
000F82	41E0 OFC4	638		BAL	RET,ERR1	PRINT 'ERROR TTNN'	MST06380
000F86	41E0 OFFE	639		BAL	RET,ERRDS1	PRINT 'DEV DDD STA SS'	MST06390
000F8A	41E0 103C	640		BAL	RET,ERRPL1	PRINT 'PSW PPPP LOC LLL'	MST06400
000F8E	4300 0F14	641		B	ERRCOM2		MST06410
		642	*				MST06420
		643	*	COMMON ERROR ROUTINE			MST06430
		644	*				MST06440
000F92	4020 OFAC	645	ERRCOM	STH	R2,COMRET		MST06450
000F96	4810 OA22	646		LH	R1,PSW2		MST06460
000F9A	9501	647		EPSR	RO,R1	DISABLE INT. 2 PROCESSOR LEVEL	MST06470
000F9C	41E0 12D8	648		BAL	LINK,TSTDU	GET LIST DEVICE DU BIT IN R1	MST06480
000FA0	2137	649		BNZS	ERRCOM1	BRANCH IF OFF-LINE	MST06490
000FA2	4020 15BC	650		STH	R2,ISITERR	SET ERROR FLAG	MST06500
000FA6	4020 15BE	651		STH	R2,NOERR		MST06510
000FAA	4300 OFAA	652		B	*	GO, PRINT ERROR MESSAGE	MST06520
	00C0 OFAC	653	COMRET	EQU	*-2		MST06530
		654	*				MST06540
000FAE	4810 15C8	655	ERRCOM1	LH	R1,TOTERR	LIST DEVICE IS OFF	MST06550
000FB2	2611	656		AIIS	R1,1		MST06560
000FB4	4010 15C8	657		STH	R1,TOTERR	INCREMENT TOTERR	MST06570
000FB8	C51C 7FFF	658		CLHI	R1,X'7FFF'	TOTERR < MAX RETAINABLE ?	MST06580
000FBC	4280 0E92	659		BL	KEEP91	NO, ABORT CURRENT TEST & GOTO NEXT	MST06590
000FC0	4300 0EBE	660		B	HALT9	YES, HALT PROCESSOR	MST06600
		661	*	-----			MST06610
		662	*	MESSAGE PRINT ROUTINES		(DO NOT OVERRIDE NOMSG OPTION)	MST06620
		663	*				MST06630
		664	*	TO PRINT 'ERROR TTNN'			MST06640
		665	*				MST06650
000FC4	C8E0 15FE	666	ERR1	LHI	R5,ERRMSG		MST06660
000FC8	41E0 1110	667		BAL	LINK,PRINT	PRINT 'ERROR TTNN'	MST06670
		668	*			TT = TEST #, NN = ERROR #	MST06680
000FCC	03CE	669		BR	RET	RETURN	MST06690
		670	*				MST06700
		671	*	TO PRINT 'DEV DDD'			MST06710
		672	*				MST06720
000FCE	24C3	673	ERRD1	LIS	RO,3	SET UP DIGITS = 3	MST06730

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000FD0	4810 1598	674	LH	R1,ERRDEV	R1 = ERROR DEV # IN BINARY	MST06740
000FD4	C820 1638	675	LHI	R2,ASCIDEV2		MST06750
000FD8	41F0 10E8	676	BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST06760
000FDC	C850 1634	677	LHI	R5,DEVMSG2		MST06770
000FE0	41F0 1110	678	BAL	LINK,PRINT	PRINT 'DEV DD'	MST06780
000FE4	030E	679	BR	RET	RETURN	MST06790
		680	*			MST06800
		681	*	TO PRINT 'STA SS'		MST06810
		682	*			MST06820
000FE6	2402	683	ERRS1	LIS R0,2	SET UP DIGITS = 2	MST06830
000FE8	D310 159A	684	LB	R1,ERRSTA	R1 = ERROR STATUS	MST06840
000FEC	C820 1630	685	LHI	R2,ASCISTA		MST06850
000FF0	41F0 10E8	686	BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST06860
000FF4	C850 162C	687	LHI	R5,STAMSG		MST06870
000FF8	41F0 1110	688	BAL	LINK,PRINT	PRINT 'STA SS'	MST06880
000FFC	030E	689	BR	RET	RETURN	MST06890
		690	*			MST06900
		691	*	TO PRINT 'DEV DDD STA SS'		MST06910
		692	*			MST06920
000FFE	2403	693	ERRDS1	LIS R0,3	SET UP DIGITS = 3	MST06930
001000	4810 1598	694	LH	R1,ERRDEV	R1 = ERROR DEV #	MST06940
001004	C820 1628	695	LHI	R2,ASCIDEV		MST06950
001008	41F0 10E8	696	BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST06960
00100C	2402	697	LIS	R0,2	SET UP DIGITS = 2	MST06970
00100E	D310 159A	698	LB	R1,ERRSTA	R1 = ERROR STATUS	MST06980
001012	C820 1630	699	LHI	R2,ASCISTA		MST06990
001016	41F0 10E8	700	BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST07000
00101A	C850 1624	701	LHI	R5,DEVMSG		MST07010
00101E	41F0 1110	702	BAL	LINK,PRINT	PRINT 'DEV DD STA SS'	MST07020
001022	030E	703	BR	RET	RETURN	MST07030
		704	*			MST07040
		705	*	TO PRINT 'LOC LLLL'		MST07050
		706	*			MST07060
001024	2404	707	ERRL1	LIS R0,4	SET UP DIGITS = 4	MST07070
001026	4810 1596	708	LH	R1,OLOC	R1= OLD LOC	MST07080
00102A	C820 164C	709	LHI	R2,ASCILOC		MST07090
00102E	41F0 10E8	710	BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST07100
001032	C850 1648	711	LHI	R5,LOCMSG		MST07110
001036	41F0 1110	712	BAL	LINK,PRINT	PRINT 'LOC LLLL'	MST07120
00103A	030E	713	BR	RET	RETURN	MST07130
		714	*			MST07140
		715	*	TO PRINT 'PSW PPPP LOC LLLL'		MST07150
		716	*			MST07160
00103C	2404	717	ERRPL1	LIS R0,4	SET UP DIGITS = 4	MST07170
00103E	4810 1592	718	LH	R1,OPSW	R1 = OLD PSW	MST07180
001042	C820 1642	719	LHI	R2,ASCIPSW		MST07190
001046	41F0 10E8	720	BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST07200
00104A	4810 1596	721	LH	R1,OLOC	R1= OLD LOC	MST07210
00104E	C820 164C	722	LHI	R2,ASCILOC		MST07220
001052	41F0 10E8	723	BAL	LINK,HEXASC	CONVERT IT TO ASCII	MST07230
001056	C850 163E	724	LHI	R5,PSWMSG		MST07240
00105A	41F0 1110	725	BAL	LINK,PRINT	PRINT 'PSW PPPP LOC LLLL'	MST07250
00105E	030E	726	BR	RET	RETURN	MST07260
		727	*	*****		MST07270

## EXRC - ETPE RO3P1 (W/CONDITIONAL ASSEMBLY)

		728	*	TO OBTAIN OPTION VALUE IN R6	(16 BITS, TARGET 16)	MST07280
		729	*			MST07290
001060	0766	730	OPTVAL	XAR R6,R6	INITIALIZE ACCUMULATOR	MST07300
001062	41F0 1232	731		BAL R15,GETCHR	GET A CHAR IN R4	MST07310
001066	24FF	732	OPTVAL0	LIS R15,15		MST07320
001068	D44F 15E4	733	OPTVAL1	CLB R4,HEXTAB(R15)	SCAN TABLE	MST07330
00106C	2334	734		BES OPTVAL2	MATCH	MST07340
00106E	27F1	735		SIS R15,1		MST07350
001070	2214	736		BNMS OPTVAL1		MST07360
001072	030C	737		BR R12	ERROR; VALUE NOT IN TABLE.	MST07370
001074	1164	738	OPTVAL2	SLLS R6,4	SHIFT LEFT 4	MST07380
001076	066F	739		CAR R6,R15	OR IN CURRENT DIGIT	MST07390
001078	41F0 1232	740	OPTVAL3	BAL R15,GETCHR	GET NEXT CHAR	MST07400
00107C	C540 005F	741		CLHI R4,X'5F'	IS IT LEFT ARROW ?	MST07410
001080	2133	742		BNES OPTVAL4		MST07420
001082	1064	743		SRLS R6,4	THROW AWAY LAST HEX ENTRY	MST07430
001084	2206	744		BS OPTVAL3		MST07440
001086	C540 000D	745	OPTVAL4	CLHI R4,13	EXIT IF CR	MST07450
00108A	033E	746		BER R14		MST07460
00108C	C540 002C	747		CLHI R4,X'2C'	OR COMMA	MST07470
001090	4230 1066	748		BNE OPTVAL0	LOOP TO PROCESS	MST07480
001094	030E	749		BR R14	RETURN	MST07490
		750	*			MST07500
		751	*	TO CONVERT (R6) FROM BINARY TO UNARY PATTERN, IN R3		MST07510
		752	*			MST07520
001096	2431	753	UNARY	LIS R3,1	INITIALIZE	MST07530
001098	C560 000F	754	UNARY1	CLHI R6,15	DONE ?	MST07540
00109C	033E	755		BER R14	RETURN	MST07550
00109E	0A33	756		AAR R3,R3	NO. SHIFT R3.	MST07560
0010A0	2661	757		AIS R6,1	INCREMENT COUNTER	MST07570
0010A2	2205	758		BS UNARY1		MST07580
		759	*			MST07590
		760	*	TO PROVIDE # OF MILLISECONDS DELAY SPECIFIED BY R0		MST07600
		761	*			MST07610
0010A4	D000 3E60	762	TIMER	STM R0,RSAVE	SAVE REGISTERS	MST07620
0010A8	2410	763		LIS R1,0		MST07630
0010AA	2421	764		LIS R2,1		MST07640
0010AC	4830 0A1C	765		LH R3,TIME	R3 = TIME CONSTANT FOR 1 MS DELAY	MST07650
0010B0	C110 10B0	766		BXLE R1,*		MST07660
0010B4	2701	767		SIS R0,1		MST07670
0010B6	2037	768		BNZS TIMER+4	LOOP TILL SPECIFIED DELAY	MST07680
0010B8	D100 3E60	769		LM R0,RSAVE	RESTORE REGISTERS	MST07690
0010BC	030F	770	TIMXT	BR LINK	RETURN	MST07700
		771	*			MST07710
		772	*	R5HEX PRINTS CONTENTS OF R5 IN HEX		MST07720
		773	*	PRINTS UPTO 4 DIGITS	(8 DIGITS, TARGET 32)	MST07730
		774	*			MST07740
0010BE	D000 3E60	775	R5HEX	STM R0,RSAVE	STORE REGISTERS	MST07750
0010C2	0E20	776		LDAR R2,R0	R2 = # OF DIGITS TO BE PRINTED	MST07760
0010C4	2721	777		SIS R2,1		MST07770
0010C6	4210 10E2	778		EM R5AB		MST07780
0010CA	1122	779		SLLS R2,2	R2 = 4(DIGITS-1)	MST07790
0010CC	0845	780	R5X	LDAR R4,R5		MST07800
0010CE	EC42 0000	781		SRAL R4,0(R2)		MST07810



## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

0010D2	C440 000F	782		NHI	R4,15	R4 = HEX DIGIT	MST07820
0010D6	D344 15E4	783		LB	R4,HEXTAB(R4)		MST07830
0010DA	41F0 11BE	784	R5XA	BAL	R15,OUTCHR		MST07840
0010DE	2724	785		SIS	R2,4		MST07850
0010E0	221A	786		BNMS	R5X	LOOP TILL ALL DIGITS	MST07860
0010E2	D100 3E60	787	R5XB	LM	R0,RSAVE	RESTORE REGISTERS	MST07870
0010E6	030F	788		BR	LINK	RETURN	MST07880
		789					MST07890
		790				* TO CONVERT HEXADECIMAL DATA IN R1 TO ASCII CHAR & STORE @ 0(R2)	MST07900
		791				*	MST07910
0010E8	D000 3E60	792	HEXASC	STM	R0,RSAVE	STORE REGISTERS	MST07920
0010EC	0830	793		LDAR	R3,R0	R3 = DIGITS	MST07930
0010EE	1132	794		SLLS	R3,2		MST07940
0010F0	2734	795		SIS	R3,4	R3 = 4(DIGITS)-4	MST07950
0010F2	0841	796	HEXASC1	LDAR	R4,R1	R4 = HEX DATA	MST07960
0010F4	EC43 0000	797		SBAL	R4,0(R3)		MST07970
0010F8	C440 000F	798		NHI	R4,15	R4 = HEX DIGIT TO BE CONVERTED	MST07980
0010FC	D344 15E4	799		LB	R4,HEXTAB(R4)		MST07990
001100	D242 0000	800		STB	R4,0(R2)	STORE ASCII CHAR	MST08000
001104	2621	801		AIS	R2,1		MST08010
001106	2734	802		SIS	R3,4		MST08020
001108	221B	803		BNMS	HEXASC1	LOOP TILL ALL DIGITS	MST08030
00110A	D100 3E60	804		LM	R0,RSAVE	RESTORE REGISTERS	MST08040
00110E	030F	805		BR	LINK	RETURN	MST08050
		806					MST08060
		807				* TO PRINT THE ASCII MESSAGE	MST08070
		808				*	MST08080
001110	D000 3E60	809	PRINT	STM	R0,RSAVE	STORE REGISTERS	MST08090
001114	D310 3E53	810		LB	R1,IOSAVE+1	LOAD LIST IDENTIFIER	MST08100
001118	2711	811		SIS	R1,1	CRT ?	MST08110
00111A	2338	812		BZS	P4		MST08120
00111C	2713	813		SIS	R1,3	CAROUSEL ?	MST08130
00111E	213A	814		BNZS	P5		MST08140
001120	D300 0A19	815		LB	R0,C300ADR+1		MST08150
001124	DE00 15B0	816		OC	R0,CAR2ND		MST08160
001128	2305	817		BS	P5		MST08170
00112A	D300 0A13	818	P4	LB	R0,PASLADR+1		MST08180
00112E	DE00 15AE	819		OC	R0,CRT2ND		MST08190
001132	41F0 12D8	820	P5	BAL	LINK,TSTDU		MST08200
001136	2335	821		BZS	P1		MST08210
001138	4010 15C2	822		STH	R1,WASDU	SET FLAG	MST08220
00113C	4300 11A6	823		B	PRINT5	EXIT	MST08230
001140	4820 15C2	824	P1	LH	R2,WASDU		MST08240
001144	4330 1172	825		BZ	P3		MST08250
001148	C810 0140	826		LHI	R1,X'140'	DELAY CONSTANT	MST08260
00114C	C8C0 1000	827		LHI	R0,X'1000'		MST08270
001150	2701	828		SIS	R0,1		MST08280
001152	2031	829		BTBS	3,1		MST08290
001154	2711	830		SIS	R1,1		MST08300
001156	2035	831		BTBS	3,5	LOOP TILL TIMEOUT	MST08310
001158	0744	832		XAR	R4,R4		MST08320
00115A	4040 15C2	833		STH	R4,WASDU		MST08330
00115E	2541	834		LCS	R4,1	CHARACTER = X'FF'	MST08340
001160	4040 15C4	835		STH	R4,WASDU1		MST08350

## EXEC - FTPE ROBP1 (W/CONDITIONAL ASSEMBLY)

001164	2434	336	LIS	R3,4		MST08360
001166	4110 11BF	337	P2	BAL	LINK,OUTCHR	MST08370
00116A	2731	838	SIS	R3,1		MST08380
00116C	2023	839	BPS	P2		MST08390
00116E	4300 0ECC	940	B	KEEP10	PRINT TOTAL, TOTERR	MST08400
		841	*			MST08410
001172	4800 15BC	842	P3	LH	RO,ISITERR	** MST08420
001175	4500 1796	843	CLH	RO,NOMSG+6	SHOULD MESSAGE BE SUPPRESSED ?	** MST08430
00117A	4280 11A6	844	BL	PRINT5	BRANCH: YES.	** MST08440
		845	*			MST08450
00117E	D345 0000	846	PRINT2	LB	R4,0(R5)	GET A MESSAGE BYTE
001182	41F0 11BE	847	BAL	LINK,OUTCHR	OUTPUT IT	MST08460
001186	274D	848	SIS	R4,13	CR ?	MST08470
001188	2333	849	BZS	PRINT3	MSG OVER	MST08480
00118A	2651	850	AIS	R5,1		MST08490
00118C	2207	851	BS	PRINT2	LOOP FOR NEXT CHAR	MST08500
00118E	244A	852	PRINT3	LIS	R4,10	LF
001190	D310 3E53	853	LB	R1,IOSAVE+1	GET LIST DEV IDENTIFIER	MST08510
001194	2713	854	SIS	R1,3	LINE PRINTER ?	MST08520
001196	2335	855	BZS	PRINT3A	BRANCH IF YES.	MST08530
001198	41F0 11BE	856	BAL	LINK,OUTCHR	LF	MST08540
00119C	2541	857	LCS	R4,1	DEL	MST08550
00119E	2302	858	BS	PRINT3B		MST08560
0011A0	2441	859	PRINT3A	LIS	R4,1	YES, OUTPUT X'01'
0011A2	41F0 11BE	860	PRINT3B	BAL	LINK,OUTCHR	TERMINAL CHARACTER
0011A6	41F0 1274	861	PRINT5	BAL	LINK,TSTBRK	MST08600
0011AA	D100 3E60	862	LM	RO,RSAVE	RESTORE REGISTERS	MST08610
0011AE	030F	863	BR	LINK	RETURN	MST08620
		864	*	-----		MST08630
		865	*	SHALL SUPPORT ROUTINES		MST08640
		866	*			MST08650
		867	*	TO OUTPUT CR,LF TO LIST DEVICE		MST08660
		868	*			MST08670
0011B0	D000 3E60	869	CRLF	STM	RO,RSAVE	STORE REGISTERS
0011B4	244D	870	LIS	R4,13		MST08680
0011B6	41F0 11BE	871	BAL	LINK,OUTCHR	OUTPUT CR	MST08690
0011BA	4300 11BE	872	B	PRINT3	LINE FEED, RESTORE, RETURN	MST08700
		873	*	-----		MST08710
		874	*	TO OUTPUT A CHARACTER TO THE LIST DEVICE		MST08720
0011BE	40F0 122E	875	OUTCHR	STH	R15,OUT1+2	SAVE RETURN ADDRESS
0011C2	D300 3E53	876	LB	RO,IOSAVE+1		MST08730
0011C6	2704	877	SIS	RO,4		MST08740
0011C8	4230 1206	878	BNZ	OUTCHR2	BRANCH IF NO TRANS PAUSE	MST08750
0011CC	4000 1230	879	STH	RO,PAUSE	RESET FLAG	MST08760
0011D0	41F0 12D8	880	OTC.0	BAL	LINK,TSTDU	ON-LINE ?
0011D4	4230 1228	881	BNZ	OUTO	BRANCH IF NO.	MST08770
0011D8	9DC1	882	SSR	RO,R1	CHARACTER TO READ ?	MST08780
0011DA	2386	883	BFFS	8,OTC.2	BRANCH IF YES	MST08790
0011DC	4810 1230	884	OTC.1	LH	R1,PAUSE	PAUSED NOW ?
0011E0	2038	885	BNZS	OTC.0	BRANCH: YES, WAIT FOR DC2	MST08800
0011E2	4300 1206	886	B	OUTCHR2	PRESSE ON	MST08810
0011E6	9FC1	887	OTC.2	RDR	RO,R1	DC2, DC4 (FDX ONLY) ?
0011E8	C410 007F	888	NHI	R1,X'7F'		MST08820
0011EC	CB10 0012	889	SHI	R1,X'12'	DC2 ?	MST08830
						MST08840
						MST08850
						MST08860
						MST08870
						MST08880
						MST08890

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

0011F0	2134	890		BNZS	OTC.3		MST08900
0011F2	4010 1230	891		STH	R1,PAUSE	RESET FLAG	MST08910
0011F6	2308	892		BS	OUTCHR2	PRESS ON	MST08920
0011F8	2712	893	CTC.3	SIS	R1,2	DC4 ?	MST08930
0011FA	4230 11D0	894		BNZ	OTC.0	NO.	MST08940
0011FE	40F0 1230	895		STH	LINK,PAUSE	SET FLAG	MST08950
001202	4300 11D0	896		B	OTC.0	AND WAIT FOR DC2	MST08960
001206	41F0 12D8	897	OUTCHR2	BAL	LINK,TSTDU	OFF-LINE ?	MST08970
00120A	213F	898		BNZS	OUTO	IF YES.	MST08980
00120C	4110 1364	899		BAL	R1,SETUP	SET UP FOR OUTPUT	MST08990
001210	9DC1	900	CTC.4	SSR	R0,R1	WAIT FOR NOT BUSY	MST09000
001212	213B	901		BTFS	3,OUTO	BRANCH IF OFF-LINE	MST09010
001214	C510 000C	902		CLHI	R1,12	PASLA OFFLINE ?	MST09020
001218	2338	903		BES	OUTO	BRANCH: YES.	MST09030
00121A	C310 0008	904		THI	R1,8	BUSY ?	MST09040
00121E	2037	905		BNZS	OTC.4	WAIT FOR NOT BUSY.	MST09050
001220	9A04	906		WDR	R0,R4	OUTPUT DATA BYTE	MST09060
001222	9DC1	907		SSR	R0,R1		MST09070
001224	2081	908		BTBS	8,1	WAIT FOR NOT BUSY.	MST09080
001226	2303	909		BS	OUT1		MST09090
001228	4010 15C2	910	OUTO	STH	R1,WASDU	SET FLAG	MST09100
00122C	4300 122C	911	OUT1	B	*	RETURN AS SET UP ABOVE	MST09110
001230	0000	912	PAUSE	DCX	0	SET DURING TRANSMISSION PAUSE	MST09120
		913					MST09130
		914				* TO GET A CHAR FROM KEYBOARD (IN REG R4)	MST09140
		915				*	MST09150
001232	4140 132C	916	GETCHR	BAL	R4,KBREAD	PUT KB DEVICE IN READ MODE	MST09160
001236	9D04	917		SSR	R0,R4		MST09170
001238	Q21F	918		BTBR	1,LINK	IF DU, RETURN	MST09180
00123A	2082	919		BTBS	8,2	IF BUSY, LOOP	MST09190
00123C	9B04	920		RDR	R0,R4	READ A CHAR IN R4	MST09200
		921				* TO ECHO RECEIVED CHARACTERS TO CONSOLE DEVICE IN FDX MODE	MST09210
00123E	D390 15A2	922	ECHO	LB	R9,CONRD		MST09220
001242	C590 00A9	923		CLHI	R9,X'A9'	CAROUSEL ?	MST09230
001246	2137	924		BNES	ECHR TN	DO NOT ECHO	MST09240
001248	D390 15A1	925		LB	R9,CONADR+1		MST09250
00124C	DD90 159B	926		SS	R9,SINK		MST09260
001250	2082	927		BTBS	8,2		MST09270
001252	9A94	928		WDR	R9,R4	ECHO RECEIVED BYTE	MST09280
001254	C440 007F	929	ECHR TN	NHI	R4,X'7F'	REMOVE PARITY BIT	MST09290
001258	030F	930		BR	LINK	RETURN	MST09300
		931					MST09310
		932				* TO OUTPUT '?' TO CONSOLE	MST09320
		933				*	MST09330
00125A	41F0 11B0	934	QUESTN	BAL	LINK,CRLF		MST09340
00125E	40F0 15BC	935		STH	LINK,ISITERR	SET FLAG	MST09350
001262	C850 169C	936		LHI	R5,QMSG		MST09360
001266	41F0 1110	937		BAL	LINK,PRINT	PRINT '?'	MST09370
00126A	0700	938		XAR	R0,R0		MST09380
00126C	4000 15BC	939		STH	R0,ISITERR		MST09390
001270	4300 0ADA	940		B	OPTIN1	TO ACCEPT COMMAND INPUT	MST09400
		941					MST09410
		942				* IF BREAK KEY DEPRESSED, GO TO 'OPTIN' OR (BRKVECT); ELSE RETURN.	MST09420
		943				*	MST09430

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

001274	D000 3EA0	944	TSTBRK	STM	RO,RSAVE+64	STORE REGISTERS	MST09440	
001278	40F0 12D6	945		STH	LINK,BRKRTN		MST09450	
00127C	D300 15A0	946		LB	RO,CONADR	GET KEYBOARD DEVICE ADR	MST09460	
001280	9D01	947		SSR	RO,R1		MST09470	
001282	C310 0020	948		THI	R1,X'20'	'BREAK' KEY PRESSED ?	MST09480	
001286	4330 12CA	949		BZ	TSTBRK3	NO. EXIT	MST09490	
00128A	4820 159E	950		LH	R2,PASFLG	PASLA ?	MST09500	
00128E	233C	951		BZS	TSTBRK1	BRANCH IF NO.	MST09510	
001290	C310 0008	952		THI	R1,8	ALREADY ACKNOWLEDGED ?	MST09520	
001294	4230 12CA	953		BNZ	TSTBRK3	BRANCH IF YES	MST09530	
001298	9B02	954		RDR	RO,R2		MST09540	
00129A	9D01	955		SSR	RO,R1		MST09550	
00129C	2281	956		BFBS	8,1		MST09560	
00129E	0822	957		LDAR	R2,R2	ZERO CHARACTER ?	MST09570	
0012A0	4230 12CA	958		BNZ	TSTBRK3	BRANCH: JUST FRAMING ERROR	MST09580	
0012A4	2305	959		BS	TSTBRK2		MST09590	
0012A6	9D01	960	TSTBRK1	SSR	RO,R1		MST09600	
0012A8	C310 0020	961		THI	R1,X'20'		MST09610	
0012AC	2033	962		BTBS	3,3	WAIT FOR BREAK KEY RELEASE	MST09620	
0012AE	48F0 15BA	963	TSTBRK2	LH	R15,BRKVECT	CHECK FOR SPECIAL ROUTINE	MST09630	
0012B2	213A	964		BNZS	TBRK2.5	BRANCH: USE VECTOR	** MST09640	
0012B4	4810 0A22	965		LH	R1,PSW2	ELSE, ABORT.	** MST09650	
0012B8	9501	966		EPSR	RO,R1	.	** MST09660	
0012BA	C850 1680	967		LHI	R5,ABTMSG	.	** MST09670	
0012BE	41F0 1110	968		BAL	R15,PRINT	** ABORTED **	** MST09680	
0012C2	4300 0AD6	969		B	OPTIN	TO EXEC.	** MST09690	
0012C6	40F0 12D6	970	TBRK2.5	STH	R15,BRKRTN	SET UP FOR EXIT	** MST09700	
0012CA	2400	971	TSTBRK3	LIS	RO,0		MST09710	
0012CC	4000 15BA	972		STH	RO,BRKVECT	DELETE VECTOR AFTER ONE SHOT.	MST09720	
0012D0	D100 3EA0	973		LM	RO,RSAVE+64	RESTORE REGISTERS	MST09730	
0012D4	4300 12D4	974		B	*	RETURN TO PROGRAM	MST09740	
	0000 12D6	975	BRKRTN	EQU	*-2		MST09750	
		976	-----					MST09760
		977	* SEE IF LIST DEVICE OFF-LINE (R1, CC NON-ZERO IF OFF)					MST09770
		978	*					MST09780
0012D8	D310 3E53	979	TSTDU	LB	R1,IOSAVE+1	GET LIST DEV IDENTIFIER	MST09790	
0012DC	2711	980		SIS	R1,1	CRT/PASLA ?	MST09800	
0012DE	213D	981		BNZS	TSTDU1	BRANCH IF NO.	MST09810	
0012E0	D300 0A12	982		LB	RO,PASLADR		MST09820	
0012E4	9D01	983	TSTDU0	SSR	RO,R1		MST09830	
0012E6	C410 00FC	984		NHI	R1,X'FC'		MST09840	
0012EA	C510 000C	985		CLHI	R1,12	BSY & EX SET ?	MST09850	
0012EE	2133	986		BTFS	3,3	BRANCH IF NOT OFF-LINE	MST09860	
0012F0	0811	987		LDAR	R1,R1	SET CONDITION CODE	MST09870	
0012F2	03CF	988		BR	LINK	DEVICE OFF-LINE	MST09880	
0012F4	0711	989		XAR	R1,R1		MST09890	
0012F6	03CF	990		BR	LINK	RETURN	MST09900	
0012F8	D300 0A14	991	TSTDU1	LB	RO,CLIFADR		MST09910	
0012FC	2711	992		SIS	R1,1	CURRENT LOOP ?	MST09920	
0012FE	233C	993		BZS	TSTDU2	BRANCH IF YES.	MST09930	
001300	D300 0A16	994		LB	RO,LPADR		MST09940	
001304	2711	995		SIS	R1,1	LP ?	MST09950	
001306	2338	996		BZS	TSTDU2	BRANCH IF YES.	MST09960	
001308	D300 0A18	997		LB	RO,C300ADR		MST09970	

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00130C	2711	998	SIS	R1,1	CAROUSEL 300 ?	MST09980
00130E	4330 12E4	999	BZ	TSTDUO	BRANCH IF YES.	MST09990
001312	4200 1312	1000	NOP	*	PROVISION FOR SPECIAL DEVICE	MST10000
001316	9DC1	1001	TSTDU2	SSR RO,R1	GET STATUS IN R1	MST10010
001318	C410 0001	1002	NHI	R1,1	R1 = DU BIT	MST10020
00131C	030F	1003	BR	LINK	RETURN	MST10030
		1004	* -----			MST10040
		1005	* TO DIRECT INPUT AND OUTPUT TO CONSOLE DEVICE			MST10050
		1006	*			MST10060
00131E	D300 0A10	1007	SETKB	LB RO,IO	GET KEYBOARD DEVICE	MST10070
001322	9410	1008		EXBR R1,RO		MST10080
001324	0610	1009		OAR R1,RO		MST10090
001326	4010 3E52	1010		STH R1,IOSAVE	KB DEVICE = LIST DEVICE	MST10100
00132A	030F	1011		BR LINK	RETURN	MST10110
		1012	* -----			MST10120
		1013	* TO PUT KEYBOARD DEVICE IN READ MODE			MST10130
		1014	*			MST10140
00132C	D300 15A0	1015	KBREAD	LB RO,CONADR		MST10150
001330	DE00 15A2	1016		OC RO,CONRD		MST10160
001334	4890 159E	1017		LH R9,PASFLG	PASLA ?	MST10170
001338	4200 1338	1018		NOP *	FOR SPECIAL KB DEVICE	MST10180
00133C	033A	1019	TTYGET	BZR R4	RETURN	MST10190
00133E	DE00 159B	1020	CRTGET	RD RO,SINK	DUMMY READ	MST10200
001342	DE00 15AC	1021		OC RO,CONRQ2S		MST10210
001346	030A	1022		BR R4	RETURN	MST10220
		1023	* -----			MST10230
		1024	* TO SET UP KEYBOARD DEV TO READ WITH INT ENABLED			MST10240
		1025	*			MST10250
001348	D000 3E60	1026	KBRD	STH RO,RSAVE	SAVE REGISTERS	MST10260
00134C	D300 15A0	1027		LB RO,CONADR	GET KB DEV ADR	MST10270
001350	4810 159E	1028		LH R1,PASFLG	PASLA ?	MST10280
001354	2333	1029		BZS KBRD1		MST10290
001356	DE00 15AC	1030		OC RO,CONRQ2S		MST10300
00135A	DE00 15A5	1031	KBRD1	OC RO,CONENRD	CONSOLE : ENABLE, READ	MST10310
00135E	D100 3E60	1032		LH RO,RSAVE	RESTORE REGISTERS	MST10320
001362	030F	1033		BR LINK	RETURN	MST10330
		1034	* -----			MST10340
		1035	* LIST DEVICE SET UP ROUTINE			MST10350
		1036	*			MST10360
001364	D300 3E53	1037	SETUP	LB RO,IOSAVE+1	GET LIST DEV IDENTIFIER	MST10370
001368	2701	1038		SIS RO,1	PASLA ?	MST10380
00136A	233F	1039		BZS CRTDRV	YES, GO TO CRT DRIVER	MST10390
00136C	2701	1040		SIS RO,1	CURRENT LOOP ?	MST10400
00136E	2338	1041		BZS TTYDRV	YES, GO TO TTY DRIVER	MST10410
001370	2701	1042		SIS RO,1	LINE PRINTER ?	MST10420
001372	233E	1043		BZS LPDRV		MST10430
001374	2701	1044		SIS RO,1	CAROUSEL 300 ?	MST10440
001376	4330 1398	1045		BZ CARDRV		MST10450
00137A	4200 137A	1046		NOP *	PROVISION TO ADD SPECIAL DEV	MST10460
00137E	D300 0A15	1047	TTYDRV	LB RO,CLIFADR+1		MST10470
001382	DE00 15B5	1048		OC RO,CLIFWRT	WRITE COMMAND TO CURR. LP. INTERF.	MST10480
001386	0301	1049		BR R1	RETURN	MST10490
001388	D300 0A13	1050	CRTDRV	LB RO,PASLADR+1		MST10500
00138C	2308	1051		BS CONDRV		MST10510

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00138E	D300 0A15	1052	LPDRV	LB	RO,LPADR		MST10520	
001392	DE00 15B2	1053		OC	RO,LPWRT	COMMAND TO LINE PRINTER	MST10530	
001396	03C1	1054		BR	R1	RETURN	MST10540	
001398	D300 0A19	1055	CARDRV	LB	RO,C300ADR+1		MST10550	
00139C	DE00 15A9	1056	CONDRV	OC	RO,CARWRT		MST10560	
0013A0	03C1	1057		BR	R1	RETURN	MST10570	
		1058	* *****					MST10580
		1059	* LOW CORE SET UP ROUTINE					MST10590
		1060	*					MST10600
0013A2	0711	1061	LCORE	XAR	R1,R1		MST10610	
0013A4	2422	1062		LIS	R2,2		MST10620	
0013A6	C830 004E	1063		LHI	R3,X'4E'		MST10630	
0013AA	0700	1064		XAR	RO,RO		MST10640	
0013AC	4001 0000	1065	ZERO1	STH	RO,0(R1)		MST10650	
0013B0	C110 13AC	1066		BXLE	R1,ZERO1	ZERO CORE FROM 0 THRU X'4F'	MST10660	
0013B4	C810 0080	1067		LHI	R1,X'80'		MST10670	
0013B8	C830 00CE	1068		LHI	R3,X'CE'		MST10680	
0013BC	42C0 13BC	1069	ZERO2	NOP	*		MST10690	
0013C0	C110 13BC	1070		BXLE	R1,ZERO2	ZERO CORE FROM X'80' THRU X'CF'	MST10700	
0013C4	C800 1470	1071		LHI	RO,XI32	INTERRUPT HANDLER ROUTINE	MST10710	
0013C8	C830 08CE	1072		LHI	R3,X'8CE'		MST10720	
0013CC	4001 0000	1073	ZERO3	STH	RO,0(R1)		MST10730	
0013D0	C110 13CC	1074		BXLE	R1,ZERO3	SET UP INT SERVICE POINTER TABLE	MST10740	
0013D4	C830 1548	1075		LHI	R3,II		MST10750	
0013D8	4030 0036	1076		STH	R3,X'36'	ILL INST INT NEW PSW LOC	MST10760	
0013DC	C840 1554	1077		LHI	R4,MM		MST10770	
0013E0	4040 003E	1078		STH	R4,X'3E'	M. M. INT NEW PSW LOC	MST10780	
0013E4	C830 1522	1079		LHI	R3,AF		MST10790	
0013E8	4030 004E	1080		STH	R3,X'4E'	ARITHMETIC FAULT NEW PSW LOC(32-BIT)	MST10800	
		1081	*			FIXED PT DIVIDE FAULT NEW PSW LOC	MST10810	
0013EC	C840 3E60	1082		LHI	R4,RSAVE		MST10820	
		1097		ENDC			MST10970	
		1098	*				MST10980	
		1099	* SET UP LOW CORE FOR 32 BIT MACHINE					MST10990
		1100	*					MST11000
0013F0	4040 0086	1101	LCORE32	STH	R4,X'86'	REG SAVE POINTER	MST11010	
0013F4	C840 3E58	1102		LHI	R4,PSWSAVE	PPF PSW SAVE AREA	MST11020	
0013F8	4040 0084	1103		STH	R4,X'84'	POINTER	MST11030	
0013FC	C830 1518	1104		LHI	R3,RP		MST11040	
001400	4030 0096	1105		STH	R3,X'96'	RELOC/PROTECT INT NEW PSW LOC	MST11050	
001404	D310 15A0	1106		LB	R1,CONADR	LOAD CCNSOLE I/O ADDRESS	MST11060	
001408	0A11	1107		AAR	R1,R1		MST11070	
00140A	C8C0 1428	1108		LHI	RO,KBINTO	RO = A(KEYBOARD INT HANDLER)	MST11080	
00140E	4061 00D0	1109		STH	RO,X'D0'(R1)	STORE @ X'D0'+2(KB DEV ADR)	MST11090	
001412	0711	1110		XAR	R1,R1	TO SET UP SERVICE POINTER TABLE	MST11100	
001414	C830 1470	1111		LHI	R3,XI32		MST11110	
001418	4821 17F4	1112	LCORE32A	LH	R2,DEVSADR(R1)	GET DEV ADR FROM TABLE	MST11120	
00141C	021F	1113		BMR	LINK	DONE. RETURN	MST11130	
00141E	0A22	1114		AAR	R2,R2		MST11140	
001420	4032 00D0	1115		STH	R3,X'D0'(R2)	STORE @ X'D0'+2(DEV ADR)	MST11150	
001424	2612	1116		AIS	R1,2		MST11160	
001426	22C7	1117		BS	LCORE32A		MST11170	
		1118	*-----*					MST11180
		1119	* KEYBOARD INTERRUPT HANDLER					MST11190

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001428	C330	0020	1120	*					MST11200
00142C	4330	1450	1121	KBINT0	THI	R3,X'20'	IS BREAK KEY DEPRESSED ?		MST11210
001430	4850	159E	1122		BZ	KBINT1	NO		MST11220
001434	2339		1123		LH	R5,PASFLG	CONSOLE ON PASLA ?		MST11230
001436	9B24		1124		BZS	KBINT0A	BRANCH IF NO.		MST11240
001438	9D23		1125		RDR	R2,R4			MST11250
00143A	2281		1126		SSR	R2,R3			MST11260
00143C	0844		1127		BFBS	8,1			MST11270
00143E	4230	146C	1128		LDAR	R4,R4			MST11280
001442	4300	0AD6	1129		BNZ	RETOPSW	IGNORE FRERR ONLY		MST11290
001446	9D23		1130	KBINT00	B	OPTIN			MST11300
001448	C330	0020	1131	KBINT0A	SSR	R2,R3			MST11310
00144C	2033		1132		THI	R3,X'20'			MST11320
00144E	2206		1133		BTBS	3,3	WAIT FOR BREAK KEY RLS		MST11330
001450	4020	1598	1134		BS	KBINT00	O TO COMMAND MODE		MST11340
001454	D230	159A	1135	KBINT1	STH	R2,INTDEV			MST11350
			1136		STB	R3,INTSTA			MST11360
			1140		ENDC				MST11400
001458	4000	1592	1141		STH	R0,OPSW	STORE OLD PSW OF 32-BIT PROCESSOR		MST11410
00145C	4010	1596	1142		STH	R1,OLOC	IN ORDER TO RETURN BACK TO TEST		MST11420
001460	9B24		1143	KBINT2	RDR	R2,R4			MST11430
001462	41F0	123E	1144		BAL	LINK,ECHO	ECHO RECEIVED BYTE		MST11440
001466	4890	1588	1145		LH	R9,KBINT	IF ZERO,IGNORE; ELSE		MST11450
00146A	0239		1146		BNZR	R9	GO,PROCESS KB INT FURTHER		MST11460
			1147	*	-----				MST11470
			1148	*	TO RETURN ON OLD PSW				MST11480
			1149	*					MST11490
	0000	146C	1150	RETOPSW	EQU	*			MST11500
			1156		ENDC				MST11560
00146C	C200	1590	1157	RETOPSW1	LPSW	OPSW32			MST11570
			1158	*	*****				MST11580
			1159	*	EXTERNAL INTERRUPT HANDLER				MST11590
			1165		ENDC				MST11650
			1166	*					MST11660
	0000	1470	1167	XI32	EQU	*	FOR 32-BIT PROCESSOR		MST11670
001470	95AA		1168		EPSR	R10,R10	CAPTURE CURRENT PSW		MST11680
001472	40A0	1588	1169		STH	R10,INTPSW			MST11690
001476	4020	1598	1170		STH	R2,INTDEV	STORE INTERRUPTING DEVICE ADDRESS		MST11700
00147A	D230	159A	1171		STB	R3,INTSTA	STORE INTERRUPTING DEVICE STATUS		MST11710
			1177		ENDC				MST11770
00147E	4000	1592	1178	XI32A	STH	R0,OPSW	STORE OLD PSW STATUS		MST11780
001482	4010	1596	1179		STH	R1,OLOC	STORE OLD PSW LOC		MST11790
			1183		ENDC				MST11830
001486	4820	0A22	1184		LH	R2,PSW2			MST11840
00148A	9512		1185		EPSR	R1,R2	SELECT USER REGISTER SET		MST11850
00148C	D000	3EE0	1186		STM	R0,INTSAV	SAVE USER REGISTERS		MST11860
001490	4820	1598	1187		LH	R2,INTDEV			MST11870
001494	48A0	1588	1188		LH	R10,INTPSW			MST11880
			1189	*					MST11890
001498	0755		1190	XI16A	XAR	R5,R5			MST11900
00149A	4865	17F4	1191	XI1	LH	R6,DEVSADR(R5)	GET DEV ADRS FROM TABLE		MST11910
00149E	4210	14E4	1192		BM	XIERR	TABLE OVERFLOW.		MST11920
0014A2	0562		1193		CLAR	R6,R2	COMPARE INTERRUPTING DEVICE ADDRESS		MST11930
0014A4	2333		1194		BES	XI2			MST11940

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0014A6	2652	1195		AIS	R5,2		YST11950
0014A8	22C7	1196		BS	XI1		MST11960
0014AA	4865 1802	1197	XI2	LH	R6,DEVINT(R5)	GET INTERRUPT HANDLER ADDRESS	MST11970
0014AE	4320 14F4	1198		BZ	XIERR	INTERRUPT NOT EXPECTED	MST11980
0014B2	4060 14E2	1199		STH	R6,XIEXIT		MST11990
		1200	*				MST12000
		1204		ENDC			MST12040
0014B6	10E1	1205		SRLS	R5,1		MST12050
0014B8	10A4	1206		SRLS	R10,4		MST12060
0014BA	C4A0 000F	1207		NHI	R10,15		MST12070
0014BE	D4A5 190E	1208		CLB	R10,INTLVL(R5)	CHECK PROPER INTERRUPT LEVEL	MST12080
0014C2	4230 14F4	1209		BNE	LVLERR		MST12090
		1210	*				MST12100
0014C6	4860 1596	1211	XI3	LH	R6,OLOC	GET PSW AT TIME OF INTERRUPT	MST12110
0014CA	C560 10A8	1212		CLHI	R6,TIMER+4		MST12120
0014CE	2187	1213		BLS	XI4	WAS INTERRUPT IN TIMER ROUTINE ?	MST12130
0014D0	C560 10BC	1214		CLHI	R6,TIMXT		MST12140
0014D4	2384	1215		BNLS	XI4	BRANCH IF NO.	MST12150
0014D6	D100 3E60	1216		LM	R0,RSAVE	RESTORE FROM 'TIMER' ENTRY	MST12160
0014DA	2303	1217		BS	XI5		MST12170
0014DC	D100 3EE0	1218	XI4	LM	R0,INTSAV	RESTORE FROM XI16/XI32 ENTRY	MST12180
0014E0	4300 14E0	1219	XI5	B	*	AND GO TO INTERRUPT HANDLER	MST12190
	0000 14E2	1220	XIEXIT	EQU	*-2		MST12200
		1221	*				MST12210
		1222	*			EXTERNAL INTERRUPT ERROR ROUTINE	MST12220
		1223	*				MST12230
0014E4	C860 4634	1224	XIERR	LHI	R6,C'F4'	ERROR # F4	MST12240
0014E8	4060 1606	1225		STH	R6,ERRNO		MST12250
0014EC	41F0 0F7A	1226		BAL	LINK,ERRALL	'ERROR XIF4', 'DEV DDD STA SS'	MST12260
		1227	*			'PSW PPPP LOC LLLL'	MST12270
0014F0	4300 0ADA	1228		B	OPIN1	TO ENTER COMMAND MODE	MST12280
		1229	*				MST12290
		1230	*			DEVICE INTERRUPTED IN WRONG INTERRUPT LEVEL	MST12300
		1231	*				MST12310
0014F4	C860 4636	1232	LVLERR	LHI	R6,C'F6'	ERROR # F6	MST12320
0014F8	4060 1606	1233		STH	R6,ERRNO		MST12330
0014FC	D3AA 15E4	1234		LB	R10,HEXTAB(R10)	CONVERT TO ASCII	MST12340
001500	D2A0 1668	1235		STB	R10,ERRLVL	AND STORE ERROR LEVEL IN MESSAGE	MST12350
001504	41F0 0F7A	1236		BAL	LINK,ERRALL	'ERROR XIF6', 'DEV DDD STA SS'	MST12360
		1237	*			'PSW PPPP LOC LLLL'	MST12370
001508	C850 1652	1238		LHI	R5,INTLVL		MST12380
00150C	4050 15BC	1239		STH	R5,ISITERR	SET FLAG TO OVERRIDE NOMSG OPTION	MST12390
001510	41F0 1110	1240		BAL	LINK,PRINT	'INTERRUPTED IN LEVEL N'	MST12400
001514	4300 0ADA	1241		B	OPIN1	ENTER COMMAND MODE.	MST12410
		1242	*				MST12420
		1243	*			SPURIOUS INTERRUPT HANDLERS	MST12430
		1249		ENDC			MST12490
		1250	*				MST12500
		1251	*			RELOCATION/PROTECTION INT TRAP	MST12510
		1252	*				MST12520
001518	C820 4635	1253	RP	LHI	R2,C'F5'		MST12530
00151C	4020 1606	1254		STH	R2,ERRNO	SET ERROR # F5	MST12540
001520	23C5	1255		BS	COMM		MST12550
		1256	*				MST12560



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		1257	*	ARITHMETIC FAULT INT (32-BIT PROCESSOR) TRAP		MST12570
		1260		ENDC		MST12600
		1261	*			MST12610
001522	C820 4631	1262	AF	LHI R2,C'F1'		MST12620
001526	4020 1606	1263		STH R2,ERRNO	SET ERROR # F1	MST12630
		1269		ENDC		MST12690
00152A	40E0 1592	1270	COMM	STH R14,OPSW		MST12700
00152E	40F0 1596	1271		STH R15,OLOC		MST12710
001532	4800 0A22	1272	COMM1	LH R0,PSW2		MST12720
001536	9520	1273		EPSR R2,R0	NO INT. , REG SET 15	MST12730
001538	41F0 0F08	1274		BAL LINK,ERR	PRINT 'ERROR X'FN'	MST12740
00153C	40F0 15BC	1275		STH LINK,ISITERR	FORCE PRINT	MST12750
001540	41F0 103C	1276		BAL RET,ERRPL1	PRINT 'PSW PPPP LOC LLLL'	MST12760
001544	4300 0ADA	1277		B OPTIN1	ENTER COMMAND MODE	MST12770
		1278	*			MST12780
		1279	*	ILLEGAL INSTRUCTION INTERRUPT TRAP		MST12790
		1280	*			MST12800
001548	C820 4632	1281	II	LHI R2,C'F2'		MST12810
00154C	4020 1606	1282		STH R2,ERRNO	SET ERROR # F2	MST12820
		1288		ENDC		MST12880
001550	4300 152A	1289	II32	B COMM		MST12890
		1290	*			MST12900
		1291	*	MACHINE HALFUNCTION INTERRUPT TRAP		MST12910
		1292	*			MST12920
001554	95AA	1293	MM	EPSR R10,R10	CAPTURE MMINT PSW	MST12930
001556	C820 4633	1294		LHI R2,C'F3'		MST12940
00155A	4020 1606	1295		STH R2,ERRNO	SET ERROR # F3	MST12950
00155E	48E0 0022	1296		LH R14,X'22'	OLD PSW ( 32-BIT PROCESSOR)	MST12960
001562	48F0 0026	1297		LH R15,X'26'	OLD LOC	MST12970
		1303		ENDC		MST13030
001566	C4E0 FFF0	1304	MM32	MHI R14,X'FFF0'		MST13040
00156A	C4A0 00F	1305		MHI R10,X'000F'		MST13050
00156E	06EA	1306		OAR R14,R10		MST13060
001570	40E0 1592	1307		STH R14,OPSW		MST13070
001574	40F0 1596	1308		STH R15,OLOC		MST13080
		1313		ENDC		MST13130
001578	C800 080F	1314		LHI R0,X'080F'		MST13140
00157C	9104	1315		SLHLS R0,4	RO = X'80F0'	MST13150
00157E	9520	1316		EPSR R2,R0	HALT PROCESSOR	MST13160
		1317	*			MST13170
		1318	*	WHEN EXE/RUN IS DEPRESSED, ERROR MSG IS PRINTED.		MST13180
		1319	*			MST13190
001580	4300 1532	1320		B COMM1		MST13200
		1321	*	*****		MST13210
		1322	*	ETPE CONSTANTS & TABLES		MST13220
		1323	*			MST13230
001584	0000	1324	FIRST	DCX 0		MST13240
001586	0000	1325	MOD32	DCX 0	FLAG FOR 32-BIT M/C(NON-ZERO)	MST13250
001588	0000	1326	INTPSW	DCX 0	(FOR 32-BIT M/C ONLY)	MST13260
001590		1327		ALIGN 8		MST13270
		1328	-----			MST13280
001590	0000	1329	OPSW32	DCX 0	OLD PSW STORAGE AREA	MST13290
001592	0000	1330	OPSW	DCX 0		MST13300
001594	0000	1331		DCX 0		MST13310

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

001596	00C0	1332	OLOC	DCX	0		MST13320
		1333	*				MST13330
001598	00C0	1334	INTDEV	DCX	0	INTERRUPTING DEV ADR	MST13340
	0000 1598	1335	ERRDEV	EQU	INTDEV	ERROR DEVICE #	MST13350
00159A	00	1336	INTSTA	DB	0	INTERRUPTING DEV STATUS	MST13360
	0000 159A	1337	ERRSTA	EQU	INTSTA	ERRONEOUS STATUS	MST13370
00159B	00	1338	SINK	DB	0	BIT BUCKET	MST13380
00159C	80	1339	NORM	DB	X'80'		MST13390
00159D	40	1340	INCR	DB	X'40'		MST13400
00159E	0000	1341	PASFLG	DCX	0	SET WHEN CONSOLE ON PASLA/PALM	MST13410
0015A0	0000	1342	CONADR	DCX	0	CONSOLE/KEYBOARD DEVICE ADDRESS	MST13420
0015A2	0000	1343	CONRD	DCX	0		MST13430
	0000 15A3	1344	CONWRT	EQU	CONRD+1		MST13440
0015A4	0000	1345	CON2ND	DCX	0	2ND CMD, ENABLE RD CMD	MST13450
	0000 15A5	1346	CONENRD	EQU	CON2ND+1		MST13460
0015A6	B9AB	1347	CRTRD	DCX	B9AB	CRT READ/WRITE COMMANDS	MST13470
	0000 15A7	1348	CRTWRT	EQU	CRTRD+1		MST13480
0015A8	A9AB	1349	CARRD	DCX	A9AB	CAROUSEL 300 READ/WRITE COMMANDS	MST13490
	0000 15A9	1350	CARWRT	EQU	CARRD+1		MST13500
0015AA	3B	1351	CRTRQ2S	DB	X'3B'		MST13510
0015AB	23	1352	CARRQ2S	DB	X'23'		MST13520
0015AC	00	1353	CONRQ2S	DB	0		MST13530
0015AE	F879	1354	CRT2ND	DCX	F879	CRT FORMAT COMMAND	MST13540
	0000 15AF	1355	CRTEHRD	EQU	CRT2ND+1	ENABLE RD CMD	MST13550
0015B0	F069	1356	CAR2ND	DCX	F069	CAROUSEL FORMAT COMMAND	MST13560
	0000 15B1	1357	CARENRD	EQU	CAR2ND+1	ENABLE RD CMD	MST13570
0015B2	80	1358	LPWRT	DB	X'80'		MST13580
0015B4	A4D8	1359	CLIFRD	DCX	A4D8		MST13590
	0000 15B5	1360	CLIFWRT	EQU	CLIFRD+1		MST13600
0015B6	0064	1361	CLIF2ND	DCX	0064	CURRENT LOOP INTERFACE	MST13610
	0000 15B7	1362	CLIFWRD	EQU	CLIF2ND+1	ENABLE RD CMD	MST13620
		1363	*				MST13630
0015B8	146C	1364	KBINT	DC	Z(RETOPSW)	KEYBOARD INT RETURN ADR	MST13640
0015BA	0000	1365	BRKVECT	DC	Z(0)	BREAK KEY VECTOR	MST13650
0015BC	0000	1366	ISITERR	DCX	0		MST13660
0015BE	0000	1367	NOERR	DCX	0		MST13670
0015C0	0000	1368	SELTST	DCX	0	HIGHEST SELECTED TEST #	MST13680
0015C2	0000	1369	WASDU	DCX	0	1 IF KEYBOARD DEVICE WAS OFF	MST13690
0015C4	0000	1370	WASDU1	DCX	0	NON-ZERO IF TOTAL,TOTERR TO PRINT	MST13700
0015C6	0000	1371	TOTAL	DCX	0	# OF TIMES THE SELECTED TESTS RUN	MST13710
0015C8	0000	1372	TOTERR	DCX	0	TOTAL ERRORS DETECTED WHILE DU	MST13720
0015CA	0000	1373	BTESTNO	DCX	0	CURRENT TEST # IN BINARY	MST13730
0015CC	0000	1374	COUNT	DCX	0		MST13740
0015CE	0000	1375	NEXTST	DCX	0	NEXT TEST #	MST13750
		1376	*				MST13760
0015D0	0000 0001	1377	DECTAB	DC	1,10,100,1000,10000		MST13770
0015D4	0000 000A						
0015D8	0000 0064						
0015DC	0000 03E8						
0015E0	0000 2710						
0015E4	30313233	1378	HEXTAB	DB	C'0123456789ABCDEF'		MST13780
	34253637						
	38394142						
	43444546						

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

		1379	*-----				MST13790
		1380	* ETPE MESSAGES				MST13800
		1381	*				MST13810
0015F4	54455354	1382	TSTMSG	DC	C'TEST *** ,X'0D00'		MST13820
	20202A2A						
0015FC	0D00						
	0000 15FA	1383	MTESTNO	EQU	*-4		MST13830
0015FE	4552524F	1384	ERRMSG	DC	C'ERROR ***** ,X'0D00'		MST13840
	52202A2A						
	2A2A						
001608	0D00						
	0000 1604	1385	ETESTNO	EQU	*-6	STORED BY ETPE	MST13850
	0000 1606	1386	ERRNO	EQU	*-4	STORE ERRNO AS CHAR CONSTANT	MST13860
00160A	544F5441	1387	TOTMSG	DC	C'TOTAL TOTERR' ,X'0D00'		MST13870
	4C202020						
	544F5445						
	5252						
001618	0D00						
00161A	4E4F2045	1388	NOERMSG	DC	C'NO ERROR' ,X'0D00'		MST13880
	52524F52						
	0D00						
001622	44455620	1389	DEVMSG	DC	C'DEV *** STA *** ,X'0D00'	**	MST13890
001624	2A2A2A20						
	53544120						
	2A2A						
001632	0D00						
	0000 1628	1390	ASCIDEV	EQU	*-12		MST13900
	0000 162C	1391	STAMSG	EQU	*-8		MST13910
	0000 1630	1392	ASCISTA	EQU	*-4		MST13920
001634	44455620	1393	DEVMSG2	DC	C'DEV ***** ,X'0D00'		MST13930
	2A2A2A20						
00163C	0D00						
	0000 1638	1394	ASCIDEV2	EQU	*-6		MST13940
00163E	50535720	1395	PSWMSG	DC	C'PSW ***** LOC ***** ,X'0D00'		MST13950
	2A2A2A2A						
	20204C4F						
	43202A2A						
	2A2A						
001650	0D00						
	0000 1642	1396	ASCIPSW	EQU	*-16		MST13960
	0000 1648	1397	LOCMSG	EQU	*-10		MST13970
	0000 164C	1398	ASCILOC	EQU	*-6		MST13980
001652	494E5445	1399	INTLVL	DC	C'INTERRUPTED IN LEVEL ** ,X'0D00'		MST13990
	52525550						
	54454420						
	494E204C						
	4556454C						
	20202A20						
00166A	0D00						
	0000 1668	1400	ERRLVL	EQU	*-4		MST14000
00.66C	44455620	1401	OUSYS	DC	C'DEV *** FALSE SYNC' ,X'0D00'	**	MST14010
	2A2A2A20						
	46414C53						
	45205359						

## EXEC - FTPE R03P1 (W/CONDITIONAL ASSEMBLY)

00167E	4E43					
001680	0D00					
001680	2A204142	1402	ABTMSG	DC	C'** ABORTED ** ,X'0D00'	** MST14020
	4F525445					
	44202A20					
00168C	0D00					
00168E	454E4420	1403	EOTMSG	DC	C'END OF TEST',X'0D00'	MST14030
	4F462054					
	45535420					
00169A	0D00					
00169C	3F0D	1404	QMSG	DC	X'3F0D'	MST14040
00169E	2A0D	1405	AMSG	DC	X'2A0D'	MST14050



## EXEC - ITPF R03P1 (W/CONDITIONAL ASSEMBLY)

001718	52455452	1421	RETRY	DC	C'RETRY ',X'0001',X'0000',X'0000'	ALLOWED RETRIES	MST14210
	5920						
00171E	00C1						
001720	0000						
001722	0000						
001724	54494D56	1422	TIMVAL	DC	C'TIMVAL',X'0000',X'0000',X'0000'		MST14220
	414C						
00172A	0000						
00172C	0000						
00172E	0000						
001730	44415441	1423	DATA	DC	C'DATA ',X'B8B8',X'0000',X'0000'	DATA BYTES WRITTEN	MST14230
	2020						
001736	B8B8						
001738	0000						
00173A	0000						
00173C	53434F50	1424	SCOPE	DC	C'SCOPE ',X'0000',X'0000',X'0000'		MST14240
	4520						
001742	0000						
001744	0000						
001746	0000						
001748	4F464653	1425	OFFSET	DC	C'OFFSET',X'0034',X'0000',X'0000'		MST14250
	4554						
00174E	0034						
001750	0000						
001752	0000						
001754	42554653	1426	BUFSIZ	DC	C'BUFSIZ',X'0000',Z(ZERONE),X'0000'		MST14260
	495A						
00175A	0000						
00175C	0C98						
00175E	0000						
001760	5345434E	1427	SECNUM	DC	C'SECNUM',X'0003',X'0000',X'0000'		MST14270
	554D						
001766	0003						
001768	0000						
00176A	0000						
00176C	5345454B	1428	SEEK	DC	C'SEEK ',X'0000',Z(ZERONE),X'0000'		MST14280
	2020						
001772	0000						
001774	0C98						
001776	0000						
001778	4C4F4F50	1429	LOOP	DC	C'LOOP ',X'0000',X'0000',X'0000'		MST14290
	2020						
00177E	0000						
001780	0000						
001782	0000						
001784	434F4E54	1430	CONTIN	DC	C'CONTIN',X'0000',Z(ZERONE),X'0000'		MST14300
	494E						
00178A	0000						
00178C	0C98						
00178E	0000						
001790	4E4F4D53	1431	NOMSG	DC	C'NOMSG ',X'0000',Z(LEVEL),X'0000' VARIABLE SUPPRESSI**		MST14310
	4720						
001796	0000						
001798	0CA8						

## EXEC - FTPE R03P1 (W/CONDITIONAL ASSEMBLY)

00179A	0000						
00179C	494E544C 4556	1432	INTLEV	DC	C'INTLEV',X'0000',Z(LEVEL),X'0000'		MST14320
0017A2	0000						
0017A4	0CA8						
0017A6	0000						
0017A8	4E4F4155 544F	1433	NOAUTO	DC	C'NOAUTO',X'0000',Z(NOAUTX),X'0000'		MST14330
0017AE	0000						
0017B0	1D12						
0017B2	0000						
	0000 17B4	1434	OPTEND2	EQU	*	END OF PRINTING OPTIONS	MST14340
0017B4	48454144 5320	1435	HEADS	DC	C'HEADS ',X'0000',Z(NOHEADR),X'0000'		MST14350
0017BA	0000						
0017BC	1C36						
0017BE	0000						
0017C0	494E4255 4620	1436	INBUF	DC	C'INBUF ',X'0000',Z(RBUFIN),X'0000'		MST14360
0017C6	0000						
0017C8	1C18						
0017CA	0000						
0017CC	4F555442 5546	1437	OUTBUF	DC	C'OUTBUF',X'0000',Z(WBUFIN),X'0000'		MST14370
0017D2	0000						
0017D4	1C1E						
0017D6	0000						
	0000 17D8	1438	OPTEND	EQU	*		MST14380
0017D8	4F505449 4F4E	1439	OPTION	DC	C'OPTION',X'0000',Z(OPTIONAD),X'0000'		MST14390
0017DE	0000						
0017E0	1C9C						
0017E2	0000						
0017E4	52554E20 2020	1440	RUN	DC	C'RUN ',X'0000',X'0000',X'0000'		MST14400
0017EA	0000						
0017EC	0000						
0017EE	0000						
0017F0	FFFF FFFF 0000 17F4	1441	DEVSADR	DC	-1		MST14410
		1442		EQU	*	INTERRUPTING DEVICE TABLE	MST14420
0017F4	0000	1443		DCX	0	SELCH	MST14430
0017F6	0000	1444		DCX	0	CONTROLLER	MST14440
0017F8	0000	1445		DCX	0	DRIVE 0	MST14450
0017FA	0C00	1446		DCX	0	DRIVE 1	MST14460
0017FC	0000	1447		DCX	0	DRIVE 2	MST14470
0017FE	0000	1448		DCX	0	DRIVE 3	MST14480
001800	FFFF	1449		DC	X'FFFF'		MST14490
001802	0000	1450	DEVINT	DC	X'0'		MST14500
001804	0000	1451		DC	X'0'		MST14510
001806	0000	1452		DC	X'0'		MST14520
001808	0000	1453		DC	X'0'		MST14530
00180A	0000	1454		DC	X'0'		MST14540
00180C	0000	1455		DC	X'0'		MST14550
00180E	0000	1456	INFLVL	DC	X'0'		MST14560

## EXEC - FTPE R03P1 (W/CONDITIONAL ASSEMBLY)

001810	0000	1457	DC	X'0'		MST14570
001812	00C0	1458	DC	X'0'		MST14580
		1459	*			MST14590
001814	FFEO	1460	DEFTSTS DCX	FFEO,04C0	DEFAULT TESTS: 0-A,15,18,19	MST14600
001816	04C0					
001818	0000 208E	1461	TESTS DC	TEST0,TEST1,TEST2,TEST3,TEST4,TEST5,TEST6,TEST7,TEST8		MST14610
00181C	0000 20CC					
001820	0000 2188					
001824	0000 21C2					
001828	0000 2200					
00182C	0000 2344					
001830	0000 25B4					
001834	0000 2682					
001838	0000 2734					
00183C	0000 273A	1462	DC	TEST9,TESTA,TESTB,TESTC,TESTD,TESTE,TESTF,TEST10		MST14620
001840	0000 2740					
001844	0000 27C8					
001848	0000 28A2					
00184C	0000 29B4					
001850	0000 2A18					
001854	0000 2A7C					
001858	0000 2B0C					
00185C	0000 2B36	1463	DC	TEST11,TEST12,TEST13,TEST14,TEST15,TEST16,TEST17		MST14630
001860	0000 2B64					
001864	0000 2B9A					
001868	0000 2BBC					
00186C	0000 2C04					
001870	0000 2CA8					
001874	0000 2D52					
001878	0000 2DFA	1464	DC	TEST18,TEST19,TEST1A,TEST1B,TEST1C		MST14640
00187C	0000 2E52					
001880	0000 2F50					
001884	0000 3010					
001888	0000 30A0					
00188C	001C	1465	MAXTST DCX	001C		MST14650
		1466	*			MST14660
	0000 0002	1467	TABSIZ EQU	2	TABLE SIZES:	MST14670
00188E	0005	1468	HEADTAB DCX	5,13		MST14680
001890	0013					
001892	0337	1469	CYLTAB DCX	337,337		MST14690
001894	0337					
		1470	* COMMAND BYTES			MST14700
		1471	*			MST14710
001896		1472	ALIGN 2			MST14720
001896	00	1473	WCMD DB	X'00'	CURRENT WRITE COMMAND	MST14730
001897	00	1474	RCMD DB	X'00'	CURRENT READ COMMAND	MST14740
001898	10	1475	CYLCMD DB	X'10'	SET CYLINDER	MST14750
001899	20	1476	HEDCMD DB	X'20'	SET HEAD	MST14760
00189A	00	1477	OFFCMD DB	X'00'	OFFSET COMMAND USED, SCOPE LOOPS	MST14770
00189B	03	1478	RCHECK DB	X'03'	READ CJECK	MST14780
00189C	30	1479	RELEASE DB	X'30'	DRIVE RELEASE COMMAND	MST14790
00189D	70	1480	CLEAR DB	X'70'	DRIVE CLEAR FAULT	MST14800
00189E	C8	1481	RESET DB	X'C8'	CONTROLLER RESET	MST14810
00189F	C2	1482	SEEK DB	X'C2'	SEEK	MST14820



## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

0018A0	C1	1483	RESTOC	DB	X'C1'	RESTORE	MST14830
0018A1	42	1484	ISKCMD	DB	X'42'	INTERRUPT SEEK COMMAND	MST14840
0018A2	41	1485	IRESTOC	DB	X'41'	INTERRUPT RESTORE COMMAND	MST14850
0018A3	08	1486	STOP	DB	X'08'	SELCH STOP	MST14860
0018A4	48	1487	ESTOP	DB	X'48'	SELCH STOP, EXTENDED MCDE	MST14870
0018A5	00	1488	GAP1	DB	X'00'		MST14880
0018A6	0F	1489	SYNC	DB	X'0F'	SYNC BYTE	MST14890
0018A7	00	1490	SLCHCMD	DB	X'00'	SELCH COMMAND USED	MST14900
		1491	*				MST14910
0018A8	30	1492	CMD.30	DB	X'30'	OFFSETS NOMINAL	MST14920
0018A9	31	1493	CMD.31	DB	X'31'	STROBE LATE	MST14930
0018AA	32	1494	CMD.32	DB	X'32'	STROBE EARLY	MST14940
0018AB	34	1495	CMD.34	DB	X'34'	SERVO MINUS	MST14950
0018AC	35	1496	CMD.35	DB	X'35'	SERVO MINUS, STROBE LATE	MST14960
0018AD	36	1497	CMD.36	DB	X'36'	SERVO MINUS, STROBE EARLY	MST14970
0018AE	38	1498	CMD.38	DB	X'38'	SERVO PLUS	MST14980
0018AF	39	1499	CMD.39	DB	X'39'	SERVO PLUS, STROBE LATE	MST14990
0018B0	3A	1500	CMD.3A	DB	X'3A'	SERVO PLUS, STROBE EARLY	MST15000
0018B1	00	1501		DB	*	END OF COMMAND BYTES	MST15010
0018B2	4130	1502	IDDC	DC	X'4130'	USED IN TEST 7	MST15020
		1503	*				MST15030
		1504	* STATUS BYTE EQUATES				MST15040
		1505	*				MST15050
		1506	* CONTROLLER				MST15060
		1507	*				MST15070
	0000 0080	1508	WRTPRT	EQU	X'80'	SECTOR WRITE-PROTECTED	MST15080
	0000 0040	1509	HDFAIL	EQU	X'40'	SECTOR HEADER MATCH FAILURE	MST15090
	0000 0020	1510	DEFSEC	EQU	X'20'	SECTOR WAS MARKED DEFECTIVE	MST15100
	0000 0010	1511	CYLOV	EQU	X'10'	CYLINDER OVERFLOW OCCURRED	MST15110
	0000 0008	1512	BSY	EQU	X'08'	BUSY	MST15120
	0000 0004	1513	EX	EQU	X'04'	EXAMINE	MST15130
	0000 0002	1514	IDLE	EQU	X'02'	CONTROLLER IDLE	MST15140
	0000 0001	1515	DATERR	EQU	X'01'	DATA TRANSFER ERROR	MST15150
		1516	*				MST15160
		1517	* DRIVE ADDITIONAL				MST15170
		1518	*				MST15180
	0000 0020	1519	ALTCHAN	EQU	X'20'	RESERVED TO ALTERNATE CHANNEL	MST15190
	0000 0010	1520	UNSAFE	EQU	X'10'	DRIVE UNSAFE	MST15200
	0000 0008	1521	NOTRDY	EQU	X'08'	DRIVE NOT READY	MST15210
	0000 0002	1522	SEEKINC	EQU	X'02'	SEEK INCOMPLETE	MST15220
	0000 0001	1523	OFFLINE	EQU	X'01'	DRIVE OFF-LINE	MST15230
		1524	*				MST15240
	0000 0040	1525	MAXSEC	EQU	64	(NORMAL) MAX SECTS + 1	MST15250
	0000 0100	1526	LRECL	EQU	256	NORMAL MODE RECORD LENGTH	MST15260
	0000 0114	1527	PRECL	EQU	276	FORMAT MODE REC LENGTH/SECTOR	MST15270
	0000 000E	1528	GAPSIZE	EQU	14	ALL-ZERO GAP SIZE	MST15280
		1529	*				MST15290
0018B4	00C0	1530	MAXCYL	DCX	0	MAX CYL ADRS + 1	MST15300
0018B6	0000	1531	MAXHEAD	DCX	0	MAX HEAD ADRS + 1	MST15310
0018B8	00C0	1532	RDER	DCX	0	READ ERROR FLAG	MST15320
0018BA	0000	1533	FLAGS	DCX	0	TEST MODULE INTERNAL FLAGS	MST15330
0018BC	00C0	1534	RFMTFLG	DCX	0	SET IF LOCYL FORMAT POT. DESTROYED	MST15340
0018BE	00C0	1535	ERRFLG1	DCX	0	SET WHEN ERROR DETECTED BY SVC	MST15350
0018C0	0000	1536	LRCC	DCX	0	CKSUM USED IN SCOPE LOOPS	MST15360

## EXEC - FTPE R03P1 (W/CONDITIONAL ASSEMBLY)

0018C2	0000	1537	RND1	DCX	0	RANDOM NUMBER	MST15370
0018C4	0000	1538	RND2	DCX	0	RANDOM NUMBER	MST15380
0018C6	0000	1539	STATE	DCX	0	CURRENT DRIVE ADDRESS	MST15390
0018C8	0000	1540	RRCTR	DCX	0	ERROR COUNTER (DECREMENTS)	MST15400
0018CA	0000	1541	RWOCMD	DCX	0	USED BY 'READ', 'WRIT'	MST15410
0018CC	0000	1542	CPCODE	DCX	0	CURRENT OPERATION'S 'CODE' (CC)	MST15420
0018CE	0000	1543	ERPSCNT	DCX	0	EXPECTED ROT POS SENSE VALUE	MST15430
0018D0	0000	1544	EDATA	DCX	0	EXPECTED DATA ON READ	MST15440
0018D2	0000	1545	RDATA	DCX	0	ACTUAL DATA READ	MST15450
0018D4	0000	1546	HEADSA	DCX	0,0	HEADS DELETED, TESTS 8,9,A	MST15460
0018D6	0000						
0018D8	0000	1547	SVCNUM	DCX	0	SVC NUMBER FROM CALLER	MST15470
0018DA	0000	1548	SEQPTR	DCX	0	ERROR PRINT CONTROL (INTERNAL)	MST15480
0018DC	0000	1549	CURSECT	DCX	0	CURRENT SECTOR (LOGICAL)	MST15490
0018DE	0000	1550	CURSECT2	DCX	0	CURRENT SECTOR (PHYSICAL)	MST15500
0018E0	0000	1551	HEAD	DCX	0	CURRENT HEAD NUMBER	MST15510
0018E2	0000	1552	CURCYL	DCX	0	CURRENT CYLINDER NUMBER	MST15520
0018E4	0000	1553	RPSCMT	DCX	0	RPS COUNT READ FROM DRIVE	MST15530
0018E6	0000	1554	COUNTER	DCX	0	INTERNAL LOOPS COUNTER	MST15540
0018E8	0000	1555	FUTADRS	DCX	0	ADRS OF PRIMARY DRIVE	MST15550
0018EA	0000	1556	SECFILAD	DCX	0	ADRS OF SECONDARY DRIVE	MST15560
0018F0		1557	ALIGN	8			MST15570
0018F0	0000 0000	1558	SVCPSW	DCX	0,0	RETURN PSW FOR SVC.DRV (32-BIT)	MST15580
0018F4	0000 0000						
0018F8	0000 0000	1559	BLKADRS	DAC	0	SVC PARAM BLK ADRS	MST15590
0018FC	0000 0000	1560	MEMTOP	DAC	0	DETECTED TOP-OF-MEMORY	MST15600
001900	0000 0000	1561	SIZE	DAC	0	IFER SIZE	MST15610
001904	0000 00FF	1562	IDSIZE	DAC	LRECL-1	USED IN TEST 7	MST15620
001908	0000 0000	1563	EXSELAD	DAC	0	SELCH END ADRS READ	MST15630
	0000 1908	1564	BCOUNT	EQU	EXSELAD	BYTE COUNT AT ERROR.	MST15640
00190C	0000 4380	1565	RDFADR	DAC	RDF	READ BUFFER ADDRESS	MST15650
001910	0000 3F60	1566	WTFADR	DAC	WTF	WRITE BUFFER ADDRESS	MST15660
001914	0000 0000	1567	SA	DAC	0	TRANSFER START	MST15670
001918	0000 0000	1568	FA	DAC	0	TRANSFER END	MST15680
00191C	0000 0000	1569	SW1SAV	DAC	0	USED IN TESTS 8,9,A	MST15690
001920	0000 0000	1570	RSRET	DAC	0	SAVE	MST15700
001924	0000 0000	1571	RWSAVE	DAC	0	SAVE	MST15710
001928	0000 0000	1572	FLGRTN	DAC	0	SAVE	MST15720
00192C	0000 0000	1573	SKRTN	DAC	0	SAVE	MST15730
001930	0000 0000	1574	INTSKR	DAC	0	SAVE	MST15740
001934	0000 0000	1575	BERN	DAC	0	RERUN ADDRESS	MST15750
001938	0000 0000	1576	RXRFL	DAC	0	ADDRESS OF TEST SVC IN LOOP TESTS	MST15760
00193C	0000 0000	1577	ERRFLG	EAC	0	ADDRESS OF TEST SVC USED	MST15770
001940	0000 0000	1578	TEMPA	DAC	0	SAVE	MST15780
001944	0000 0000	1579	TEMPB	DAC	0	SAVE	MST15790
001948	0000 0000	1580	TEMPC	DAC	0	SAVE	MST15800
		1581	*				MST15810
	0000 194C	1582	STATTAB	EQU	*	DEVICE STATUSES ON GIVEN ERROR	MST15820
00194C	00	1583	DB	0		SELECTOR CHANNEL	MST15830
00194D	00	1584	DB	0		DISC SYSTEM CONTROLLER	MST15840
00194E	00	1585	DB	0		DRIVE 0	MST15850
00194F	00	1586	DB	0		DRIVE 1	MST15860
001950	00	1587	DB	0		DRIVE 2	MST15870
001951	00	1588	DB	0		DRIVE 3	MST15880

## EXEC - FTPE R03P1 (W/CONDITIONAL ASSEMBLY)

		1589	*				MST15890
	0000 1952	1590	SVCVECTS	EQU	*	SVC NEW PSW LOCATIONS	MST15900
001952	3920	1591		DC	Z(SVC0.OP)		MST15910
001954	392E	1592		DC	Z(SVC1.OP)		MST15920
001956	393A	1593		DC	Z(SVC2.OP)		MST15930
001958	3946	1594		DC	Z(SVC3.OP)		MST15940
00195A	3952	1595		DC	Z(SVC4.OP)		MST15950
00195C	395E	1596		DC	Z(SVC5.OP)		MST15960
00195E	3964	1597		DC	Z(SVC6.OP)		MST15970
001960	396E	1598		DC	Z(SVC7.OP)		MST15980
001962	3978	1599		DC	Z(SVC8.OP)		MST15990
001964	3982	1600		DC	Z(SVC9.OP)		MST16000
	0000 0003	1602	DCAD	EQU	3		MST16020
	0000 0004	1603	SLAD	EQU	4		MST16030
	0000 0005	1604	FUT	EQU	5		MST16040
	0000 0006	1605	WK0	EQU	6		MST16050
	0000 0007	1606	WK1	EQU	7		MST16060
	0000 0008	1607	WK2	EQU	8		MST16070
	0000 0009	1608	WK3	EQU	9		MST16080
	0000 000A	1609	STAT	EQU	10		MST16090
	0000 000B	1610	TRACK	EQU	11		MST16100
	0000 000C	1611	OPKEY	EQU	12		MST16110
	0000 000D	1612	SECT	EQU	13		MST16120
	0000 000E	1613	RETN2	EQU	14		MST16130
	0000 000F	1614	RETN	EQU	15		MST16140
		1616	*	MESSAGES			MST16160
		1617	*				MST16170
001966		1618	IFNZ	ADC-2			MST16180
001966	4B534D20	1619	TITLE	DB	C'MSM DISC TEST 06-200F02R01 (32-BIT)'		MST16190
	44495343						
	20544553						
	54203036						
	2D323030						
	46303252						
	30312028						
	33322D42						
	495429						
		1622		ENDC			MST16220
001989	0D	1623		DB	X'OD'		MST16240
00198A	454E5445	1624	MSG01	DB	C'ENTER DELETED HEADS',X'OD'		MST16250
	52204445						
	4C455445						
	44204845						
	4144530D						
00199E	494E5641	1625	MSG02	DB	C'INVALID OPTION',X'OD'		MST16260
	4C494420						
	20202020						
	20202020						

## EXEC - FTPE R03P1 (W/CONDITIONAL ASSEMBLY)

	204F5054					
	494F4E0D					
0019B6	494C4C45	1626	MSG03	DB	C'ILLEGAL CYLADRS - CE PACK',X'0D'	MST16270
	47414C20					
	43594C41					
	44525320					
	2E204345					
	20504143					
	48CD					
0019D0	52452D46	1627	MSG04	DB	C'RE-FORMAT LOCYL',X'0D'	MST16280
	4F524D41					
	54204C4F					
	43594C0D					
0019E0	44454620	1628	MSG05	DB	C'DEF SEC FLAGGED *** ** **',X'0D'	MST16290
	53454320					
	464C4147					
	47454420					
	2A2A2A20					
	2A2A202A					
	2A0D					
0019FA	464C4147	1629	MSG06	DB	C'FLAG REJECTED <---X',X'0D'	MST16300
	2052454A					
	45435445					
	44203C2D					
	2D2D580D					
001A0E	54414B45	1630	MSG07	DB	C'TAKE DRIVE OFF-LINE',X'0D'	MST16310
	20445249					
	5645204F					
	46462D4C					
	494E450D					
	0000 1A12	1631	MSG08	EQU	MSG07+4	MST16320
001A22	50555420	1632	MSG09	DB	C'PUT DRIVE ON-LINE',X'0D'	MST16330
	44524956					
	45204F4E					
	2D4C494E					
	450D					
001A34	53455420	1633	MSG10	DB	C'SET WRITE-PROTECT OFF',X'0D'	MST16340
	57524954					
	452D5052					
	4F544543					
	54204F46					
	46CD					
	0000 1A37	1634	MSG11	EQU	MSG10+3	MST16350
001A4A	53455420	1635	MSG12	DB	C'SET WRITE-PROTECT ON',X'0D'	MST16360
	57524954					
	452D5052					
	4F544543					
	54204F4E					
	0D					
	0000 1A4D	1636	MSG13	EQU	MSG12+3	MST16370
001A5F	534F4C49	1637	MSG14	DB	C'SOLID ERROR:',X'0D'	MST16380
	44204552					
	524F523A					
	0D					

## EXEC - FTPE R03P1 (W/CONDITIONAL ASSEMBLY)

001A6C	42595445 53202020 20202020 20524541 44202A2A 2A2A0D	1638	MSG15	DB	C'BYTES	READ *****',X'OD'	MST16390
001A83	53454C43 48204641 20202020 2020200D	1639	MSG16	DB	C'SELCH FA	',X'OD'	MST16400
001A94		1640		ALIGN	2		MST16405
001A94	53484F55 4C442042 45202020 20202020 200D	1641	MSG17	DB	C'SHOULD BE	',X'OD'	MST16410
001AA6	43594C20 2A2A2A20 48454144 202A2A20 53454354 202A2A0D	1642	MSG18	DB	C'CYL *** HEAD ** SECT **',X'OD'		MST16420
001ABE	414C5445 524E4154 45204348 414E4E45 4C204255 53590D	1643	MSG19	DB	C'ALTERNATE CHANNEL BUSY',X'OD'		MST16430
001AD5	20464F52 4D415420 53574954 4348204F 46460D	1644	MSG20	DB	C' FORMAT SWITCH OFF',X'OD'		MST16440
001AE8	50524F54 45435445 44205752 49544520 56494F4C 4154494F 4E0D	1645	MSG21	DB	C'PROTECTED WRITE VIOLATION',X'OD'		MST16450
001B02	48415244 20524541 44204552 524F520D	1646	MSG22	DB	C'HARD READ ERROR',X'OD'		MST16460
001B12	534F4654 20524541 44204552 524F520D	1647	MSG23	DB	C'SOFT READ ERROR',X'OD'		MST16470
001B22		1648		ALIGN	2		MST16480
001B22	54455354 20205858 20204142 4FE25445 440D	1649	MSG24	DB	C'FEST XX ABORTED',X'OD'		MST16490

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

001B34	4D454D4F 5259204C 494D4954 20455843 45454445 440D	1650	MSG25	DB	C'MEMORY LIMIT EXCEEDED',X'0D'	MST16500
001B4A	53454C45 4354204E 45572053 4543544F 52204F50 54494F4E 0D	1651	MSG26	DB	C'SELECT NEW SECTOR OPTION',X'0D'	MST16510
001B63	53544154 5 2  20202020 20202020 20202020 20202020 20200D	1652	MSG27	DB	C'STATUS                   ',X'0D'(6 DEVICES)	MST16520
001B7E	494E4255 46202020 20202020 200D	1653	MSG28	DB	C'INBUF           ',X'0D'	MST16530
001B8C	4F555442 55462020 20202020 200D	1654	MSG29	DB	C'OUTBUF       ',X'0D'	MST16540
001B9A	52505320 202A2A0D	1655	MSG30	DB	C'RPS   ***,X'0D'	MST16550
001BA2		1656		ALIGN 2		MST16560
001BA2	4552524F 52205454 43434E4E 0D	1657	MSG31	DB	C'ERROR TTCCNN',X'0D'	MST16570
001BAF	41545445 4D505449 4E472052 452D464F 524D4154 0D	1658	MSG32	DB	C'ATTEMPTING RE-FORMAT',X'0D'	MST16580
001BC4	4241434B 47524F55 4E442046 41494C55 52450D	1659	MSG33	DB	C'BACKGROUND FAILURE',X'0D'	MST16590
001BD7	5245464F 524D4154 2041424F 52544544 0D	1660	MSG34	DB	C'REFORMAT ABORTED',X'0D'	MST16600
001BE8	414C5445 524E4154 45205345	1661	MSG35	DB	C'ALTERNATE SECTOR ASSIGNED',X'0D'	MST16610

EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

	43544F52					
	20415353					
	49474E45					
	440D					
001C02	50524F43	1662	MSG36	DB	C'PROCEED WITH CAUTION',X'0D'	MST16620
	45454420					
	57495448					
	20434155					
	54494F4E					
	0D					
001C17	00	1663		DB	*	MST16630

EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

		1666	*OPTION ENTRY HANDLERS		MST16660
		1667	*		MST16670
001C18	E610 190C	1668	RBUFIN LDAI R1,RDFADR	READ BUFFER POINTER	MST16680
001C1C	2303	1669	BS BUFIN.1		MST16690
001C1E	E610 1910	1670	WBUFIN LDAI R1,WTFADR	WRITE BUFFER POINTER	MST16700
001C22	C460 FFFE	1671	BUFIN.1 NHI R6,X'FFFE'	FORCE ALIGN 2	MST16710
001C26	F560 0000 3F60	1672	CLAI R6,WTF	ABOVE PROGRAM ?	MST16720
001C2C	028C	1673	BLR R12	INPUT ERROR	MST16730
001C2E	5061 0000	1674	STA R6,0(R1)	SAVE OPTION VALUE	MST16740
001C32	4300 0AD6	1675	B OPTIN		MST16750
		1676	*		MST16760
001C36	2470	1677	NOHEADR LIS R7,0		MST16770
001C38	2480	1678	LIS R8,0		MST16780
001C3A	0866	1679	LDAR R6,R6	HEADS 0 ?	MST16790
001C3C	4330 1C90	1680	BZ NOHEAD1	BRANCH: DELETE NONE.	MST16800
001C40	41F0 1CEA	1681	BAL R15,RFMTCK	CHECK IF RE-FORMAT REQ'D.	MST16810
001C44	41F0 0C98	1682	BAL R15,ZERONE	MUST BE 0 OR 1	MST16820
001C48	E650 198A	1683	LDAI R5,MSG01		MST16830
001C4C	4050 15BC	1684	STH R5,ISITERR		MST16840
001C50	41F0 1180	1685	BAL LINK,CRLF		MST16850
001C54	41F0 1110	1686	BAL R15,PRINT	'ENTER DELETED HEADS'	MST16860
001C58	C840 003E	1687	LHI R4,C'>'		MST16870
001C5C	41F0 11BE	1688	BAL R15,OUTCHR	'>' FOR PROMPT	MST16880
001C60	2541	1689	LCS R4,1		MST16890
001C62	41F0 11BE	1690	BAL R15,OUTCHR	FOLLOWED BY 'DELETE' FOR PASLA	MST16900
		1691	*		MST16910
001C66	4850 18B6	1692	LH R5,MAXHEAD		MST16920
001C6A	41E0 1060	1693	NOH.1 BAL R14,OPTVAL		MST16930
001C6E	0565	1694	CLAR R6,R5		MST16940
001C70	038C	1695	BNLR R12	INVALID HEAD #	MST16950
001C72	C560 0010	1696	CLHI R6,16		MST16960
001C76	2385	1697	BNLS NOH.2		MST16970
001C78	41E0 1096	1698	BAL R14,UNARY		MST16980
001C7C	0673	1699	OAR R7,R3	SET CURRENT BIT	MST16990
001C7E	2306	1700	BS NOH.3		MST17000
001C80	CB60 0010	1701	NOH.2 SHI R6,16		MST17010
001C84	41E0 1096	1702	BAL R14,UNARY		MST17020
001C88	0683	1703	OAR R8,R3	SET CURRENT BIT	MST17030
001C8A	274D	1704	NOH.3 SIS R4,13		MST17040
001C8C	4230 1C6A	1705	BNZ NOH.1		MST17050
001C90	4070 18D4	1706	NOHEAD1 STH R7,HEADSA		MST17060
001C94	4080 18D6	1707	STH R8,HEADSA+2		MST17070
001C99	4300 0AD6	1708	B OPTIN	TO COMMAND MODE	MST17080
		1709	*		MST17090
001C9C	41F0 11B0	1710	OPTIONAD BAL R15,CRLF		MST17100
001CA0	2406	1711	LIS R0,ADC+2	DIGIT COUNT	MST17110
001CA2	5810 190C	1712	LDA R1,RDFADR		MST17120
001CA6	E620 1385	1713	LDAI R2,MSG28+7		MST17130
001CAA	41F0 10E8	1714	BAL R15,HEXASC		MST17140
001CAE	40F0 15BC	1715	STH R15,ISITERR	FORCE PRINT	MST17150
001CB2	E650 137E	1716	LDAI R5,MSG28		MST17160



## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

001CB6	41F0	1110	1717	BAL	R15,PRINT	'INBUF...'	MST17170
001CBA	5810	1910	1718	LDA	R1,WFADR		MST17180
001CBE	E620	1B93	1719	LDAI	R2,MSG29+7		MST17190
001CC2	41F0	10E8	1720	BAL	R15,HEXASC		MST17200
001CC6	E650	1B8C	1721	LDAI	R5,MSG29		MST17210
001CCA	41F0	1110	1722	BAL	R15,PRINT	'OUTBUF...'	MST17220
			1723	*			MST17230
001CCE	C820	17B4	1724	LHI	R2,HEADS		MST17240
001CD2	4020	0B98	1725	STH	R2,OPTCMD1+2		MST17250
001CD6	E630	18CE	1726	LDAI	R3,HEADSA-6		MST17260
001CDA	41E0	0B94	1727	BAL	R14,OPTCMD	'HEADS N1,N2,....'	MST17270
001CDE	C820	16A0	1728	LHI	R2,TEST		MST17280
001CE2	4020	0B98	1729	STH	R2,OPTCMD1+2		MST17290
001CE6	4300	0B88	1730	B	OPTRN		MST17300
			1731	*			MST17310
001CEA	4800	18BC	1732	RFMTCK	LH R0,RFMTFLG	REFORMAT REQUIRED ?	MST17320
001CEE	033F		1733	BZR	R15	BRANCH: NO.	MST17330
001CF0	41F0	11B0	1734	BAL	R15,CRLF		MST17340
001CF4	E650	19D0	1735	LDAI	R5,MSG04		MST17350
001CF8	4050	15BC	1736	STH	R5,ISITERR		MST17360
001CFC	41F0	1110	1737	BAL	R15,PRINT	'RE-FORMAT LOCYL'	MST17370
001D00	4800	17AE	1738	LH	R0,NOAUTO+6	AUTO FUNCTIONS INHIBITED ?	MST17380
001D04	4330	0AEO	1739	BZ	OPTIN2	BRANCH: NO. MUST REFORMAT.	MST17390
001D08	2400		1740	LIS	R0,0		MST17400
001D0A	4000	18BC	1741	STH	R0,RFMTFLG	YES. USER RESPONSIBLE AFTER WARNING.	MST17410
001D0E	4300	0AEO	1742	B	OPTIN2		MST17420
			1743	*			MST17430
001D12	41F0	0C98	1744	NOAUTX	BAL R15,ZERONE		MST17440
001D16	4800	17AE	1745	LH	R0,NOAUTO+6		MST17450
001D1A	4060	17AE	1746	STH	R6,NOAUTO+6		MST17460
001D1E	0506		1747	CLAR	R0,R6	CHANGING OPTION ?	MST17470
001D20	2339		1748	BES	NOAU.1	BRANCH: NO.	MST17480
001D22	E650	1C02	1749	LDAI	R5,MSG36		MST17490
001D26	4050	15BC	1750	STH	R5,ISITERR		MST17500
001D2A	41F0	11B0	1751	BAL	R15,CRLF		MST17510
001D2E	41F0	1110	1752	BAL	R15,PRINT	'PROCEED WITH CAUTION'	MST17520
001D32	4300	0AD6	1753	NOAU.1	B OPTIN		MST17530
			1755	*	OPTION INPUT ERROR ROUTINES USED AFTER 'RUN' COMMAND.		MST17550
			1756	*			MST17560
001D36	41F0	1D94	1757	ERROR1	BAL R15,SETMSG	INVALID SECNUM OPTION	MST17570
001D3A	1760		1758	EC	Z(SECNUM)		MST17580
001D3C	41F0	1D94	1759	ERROR2	BAL R15,SETMSG	INVALID DRIVE OPTION	MST17590
001D40	1700		1760	DC	Z(DRIVE)		MST17600
001D42	41F0	1D94	1761	ERROR3	BAL R15,SETMSG	INVALID LOCYL OPTION	MST17610
001D46	16AC		1762	DC	Z(LOCYL)		MST17620
001D48	41F0	1D94	1763	ERROR4	BAL R15,SETMSG	INVALID HICYL OPTION	MST17630
001D4C	16B8		1764	DC	Z(HICYL)		MST17640
001D4E	41F0	1D94	1765	ERROR5	BAL R15,SETMSG	INVALID SECTOR OPTION	MST17650
001D52	16C4		1766	DC	Z(SECTOR)		MST17660
001D54	41F0	1D94	1767	ERROR6	BAL R15,SETMSG	INVALID OFFSET OPTION	MST17670
001D58	1748		1768	DC	Z(OFFSET)		MST17680

## EXFC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

001D5A	41F0 1D94	1769	ERROR7	BAL	R15,SETMSG	INVALID PACTYP OPTION	MST17690	
001D5E	16E0	1770		DC	Z(PACTYP)		MST17700	
001D60	41F0 1D94	1771	ERROR9	BAL	R15,SETMSG	INVALID SCOPE OPTION	MST17710	
001D64	173C	1772		DC	Z(SCOPE)		MST17720	
001D66	41F0 1D94	1773	ERROR10	BAL	R15,SETMSG	INVALID TIMVAL OPTION	MST17730	
001D6A	1724	1774		DC	Z(TIMVAL)		MST17740	
001D6C	E650 19B6	1775	ERROR11	LDAI	R5,MSG03	INVALID CYLADRS - CE PACK	MST17750	
001D70	4300 1DAC	1776		B	PRINTIT		MST17760	
001D74	E650 1934	1777	ERROR12	LDAI	R5,MSG25	AVAILABLE MEMORY EXCEEDED	MST17770	
001D78	4300 1DAC	1778		B	PRINTIT		MST17780	
001D7C	41F0 1D94	1779	ERROR13	BAL	R15,SETMSG	INVALID XFILE OPTION	MST17790	
001D80	170C	1780		DC	Z(XFILE)		MST17800	
001D82	41F0 1D94	1781	ERROR14	BAL	R15,SETMSG	INVALID INBUF OPTION	MST17810	
001D86	17C0	1782		DC	Z(INBUF)		MST17820	
001D88	41F0 1D94	1783	ERROR15	BAL	R15,SETMSG	INVALID OUTBUF OPTION	MST17830	
001D8C	17CC	1784		DC	Z(OUTBUF)		MST17840	
001D8E	41F0 1D94	1785	ERROR16	BAL	R15,SETMSG	INVALID HEADS OPTION	MST17850	
001D92	17B4	1786		DC	Z(HEADS)		MST17860	
		1787	*				MST17870	
001D94	485F 0000	1788	SETMSG	LH	R5,0(R15)	GET ARGUMENT POINTER	MST17880	
001D98	2486	1789		LIS	WK2,6		MST17890	
001D9A	D375 0005	1790	SETMSG1	LB	WK1,5(R5)		MST17900	
001D9E	D278 19A7	1791		STB	WK1,MSG02+9(WK2)		MST17910	
001DA2	2751	1792		SIS	R5,1		MST17920	
001DA4	2781	1793		SIS	WK2,1		MST17930	
001DA6	2026	1794		BPS	SETMSG1		MST17940	
001DA8	E650 199E	1795		LDAI	R5,MSG02		MST17950	
001DAC	41F0 131E	1796	PRINTIT	BAL	LINK,SETKB		MST17960	
001DB0	40F0 15BC	1797		STH	LINK,ISITERR	FORCE PRINT	MST17970	
001DB4	41F0 1110	1798		BAL	R15,PRINT		MST17980	
001DB8	4300 OADA	1799		B	OPTIN1	TO EXEC	MST17990	
		1801	*INITIALIZATION					MST18010
001DBC	C860 6000	1802	INIT	LHI	R6,X'8000'		MST18020	
001DC0	4660 16A6	1803		CH	R6,TEST+6		MST18030	
001DC4	4060 16A6	1804		STH	R6,TEST+6	SET TEST0 BIT	MST18040	
		1805	*				MST18050	
001DC8	E600 1D36	1806		LDAI	R0,ERROR1		MST18060	
001DCC	4870 1766	1807		LH	WK1,SECNUM+6		MST18070	
001DD0	2671	1808		AIS	WK1,1		MST18080	
001DD2	0330	1809		BZR	R0	INVALID SECNUM OPTION	MST18090	
001DD4	1071	1810		SRLS	WK1,1	INPUT EVEN-POWER-OF-2 (LESS 1)	MST18100	
001DD6	2281	1811		BFBS	8,1	WAIT FOR CARRY	MST18110	
001DD8	0230	1812		BNZR	R0		MST18120	
		1813	*				MST18130	
001DDA	41F0 3598	1814		BAL	R15,XFERSIZP	GET LARGEST TRANSFER SIZE	MST18140	
001DDE	5910 1910	1815		LDA	R1,WTFADR	WRITE BUFFER ADDRESS	MST18150	
001DE2	5820 190C	1816		LDA	R2,RDFADR		MST18160	
001DE6	0512	1817		CLAR	R1,R2	IS WTF BELCW RDF ?	MST18170	
001DE8	2386	1818		BNLS	INI.W1	BRANCH: NO.	MST18180	
001DEA	0A10	1819		AAR	R1,R0	WTF END ADDRESS;	MST18190	
001DEC	0512	1820		CLAR	R1,R2	BUFFER OVERLAP ?	MST18200	

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

001DEE	4380 1D88	1821	BNL	ERROR15	BRANCH: INV. OUTBUF OPTION	MST18210	
001DF2	2305	1822	BS	INI.W2		MST18220	
001DF4	0A20	1823	INI.W1	AAR	R2,R0	RDF END ADDRESS	MST18230
001DF6	0521	1824		CLAR	R2,R1	BUFFER OVERLAP ?	MST18240
001DF8	4380 1D82	1825		BNL	ERROR14	BRANCH: INV. INBUF OPTION	MST18250
		1826	*				MST18260
001DFC	E600 1D7C	1827	INI.W2	LDAI	R0,ERROR13		MST18270
001E00	4860 1706	1828		LH	R6,DRIVE+6		MST18280
001E04	C360 FFFC	1829		THI	R6,X'FFFC'		MST18290
001E08	4230 1D3C	1830		BNZ	ERROR2	INVALID DRIVE OPTION	MST18300
001E0C	4870 1712	1831		LH	R7,XFILE+6		MST18310
001E10	2418	1832		LIS	R1,X'0008'		MST18320
001E12	4410 16A6	1833		NH	R1,TEST+6	IS XFILE (TEST OC) TO BE RUN ?	MST18330
001E16	2334	1834		BZS	INI.W3	BRANCH: NO.	MST18340
001E18	C370 FFFC	1835		THI	R7,X'FFFC'	VALID ?	MST18350
001E1C	0230	1836		BNZR	R0	BRANCH: INVALID XFILE OPTION.	MST18360
001E1E	0567	1837	INI.W3	CLAR	R6,R7	SAME AS 'DRIVE' ?	MST18370
001E20	0330	1838		BER	R0	INVALID XFILE OPTION	MST18380
001E22	4800 16FA	1839		LH	R0,DISCON+6		MST18390
001E26	2601	1840		AIS	R0,1		MST18400
001E28	0A60	1841		AAR	R6,R0		MST18410
001E2A	0A70	1842		AAR	R7,R0		MST18420
001E2C	4060 18E8	1843		STH	R6,FUTADRS	MAIN DRIVE'S ADDRESS	MST18430
001E30	4070 18EA	1844		STH	R7,SECFILAD	SECONDARY DRIVE'S ADDRESS	MST18440
		1845	*				MST18450
001E34	D370 16D7	1846		LB	R7,PACTYP+7		MST18460
001E38	C570 0002	1847		CLHI	R7,TABSIZ	VALID ENTRY ?	MST18470
001E3C	4380 1D5A	1848		BNL	ERROR7		MST18480
001E40	1171	1849		SLLS	R7,1		MST18490
001E42	4887 1892	1850		LH	R8,CYLTAB(R7)		MST18500
001E46	4080 18B4	1851		STH	R8,MAXCYL	VALID FOR DRIVE TYPE SELECTED	MST18510
001E4A	4877 188E	1852		LH	R7,HEADTAB(R7)		MST18520
001E4E	4070 18B6	1853		STH	R7,MAXHEAD		MST18530
		1854	*				MST18540
001E52	48E0 16BE	1855		LH	TRACK,HICYL+6		MST18550
001E56	4210 1D48	1856		BM	ERROR4		MST18560
001E5A	45B0 18B4	1857		CLH	TRACK,MAXCYL	NOR MORE THAN MAX VALID.	MST18570
001E5E	4380 1D48	1858		BNL	ERROR4		MST18580
001E62	45B0 16B2	1859		CLH	TRACK,LOCYL+6		MST18590
001E66	4280 1D42	1860		BL	ERROR3	INVALID LOCYL OPTION	MST18600
001E6A	41F0 33DA	1861		BAL	RETN,ILLADD		MST18610
001E70	0000 1D6C	1862		DAC	ERROR11	ERROR RETURN	MST18620
001E74	48E0 16B2	1863		LH	TRACK,LOCYL+6		MST18630
001E78	4210 1D42	1864		BM	ERROR3		MST18640
001E7C	41F0 33DA	1865		BAL	RETN,ILLADD		MST18650
001E80	0000 1D6C	1866		DAC	ERROR11	ERROR RETURN	MST18660
		1867	*				MST18670
001E84	4870 172A	1868		LH	R7,TIMVAL+6		MST18680
001E88	4320 1D66	1869		BNP	ERROR10	INVALID TIMVAL OPTION	MST18690
001E8C	4070 0A1C	1870		STH	R7,TIME	PROCESSOR TIME CONSTANT	MST18700
001E90	1074	1871		SRLS	R7,4	PRECISION WHICH WILL BE USED:	MST18710
001E92	4330 1D66	1872		BZ	ERROR10	UNDERFLOW.	MST18720
		1873	*				MST18730
001E96	D360 174F	1874		LS	R6,OFFSET+7	LOAD OFFSET COMMAND	MST18740

## EXEC - ETPE RO3P1 (W/CONDITIONAL ASSEMBLY)

001E9A	0R76	1875		LDAR	R7,R6		MST18750
001E9C	2339	1876		BZS	INI.0		MST18760
001E9E	2418	1877		LIS	R1,8		MST18770
001EA0	D471 13A8	1878	INI.X	CLB	R7,CMD.30(R1)		MST18780
001EA4	2335	1879		BES	INI.0	BRANCH: VALID OFFSET COMMAND.	MST18790
001EA6	2711	1880		SIS	R1,1		MST18800
001EA8	2214	1881		BNMS	INI.X		MST18810
001EAA	4300 1D54	1882		B	ERROR6	INVALID OFFSET OPTION.	MST18820
		1883	*				MST18830
001EAE	D360 16CA	1884	INI.0	LB	R6,SECTOR+6	HEAD PORTION	MST18840
001EB2	4560 1886	1885		CLH	R6,MAXHEAD		MST18850
001EB6	4380 1D4E	1886		BNL	ERROR5		MST18860
001EBA	E610 18D4	1887		LDAl	R1,HEADSA	DELETED HEAD BITS -	MST18870
001EBE	C560 0010	1888		CLHI	R6,16		MST18880
001EC2	2184	1889		BLS	INI.A		MST18890
001EC4	CB60 0010	1890		SHI	R6,16		MST18900
001EC8	2612	1891		AIS	R1,2		MST18910
001ECA	41E0 1096	1892	INI.A	BAL	R14,UNARY	SET MASK POSITION	MST18920
001ECE	4431 0000	1893		NH	R3,0(R1)	SECTOR, HEADS OPTION MUST AGREE:	MST18930
001ED2	4230 1D8E	1894		BNZ	ERROR16	INVALID HEADS OPTION	MST18940
001ED6	D360 16CB	1895		LB	R6,SECTOR+7	SECTOR PORTION	MST18950
001EDA	C560 0041	1896		CLHI	R6,MAXSEC+1	0-X*40° VALID IN SOME CASES	MST18960
001EDE	4380 1D4E	1897		BNL	ERROR5		MST18970
		1898	*				MST18980
001EE2	4860 1742	1899		LH	R6,SCOPE+6		MST18990
001EE6	1062	1900		SRLS	R6,2	0-3 VALID IN SOME CASES	MST19000
001EE8	4230 1D60	1901		BNZ	ERROR9		MST19010
		1902	*				MST19020
001EEC	4860 16EE	1903		LH	R6,SELCH+6	SET UP SYSTEM DEVICES TABLE	MST19030
001EF0	4060 17F4	1904		STH	R6,DEVSA DR		MST19040
001EF4	4860 16FA	1905		LH	R6,DISCON+6		MST19050
001EF8	4060 17F6	1906		STH	R6,DEVSA DR+2		MST19060
001EFC	2470	1907		LIS	R7,0		MST19070
001EFE	2661	1908	INI.1	AIS	R6,1		MST19080
001F00	4067 17F8	1909		STH	R6,DEVSA DR+4(R7)	DRIVES 0-3	MST19090
001F04	2672	1910		AIS	R7,2		MST19100
001F06	C570 0008	1911		CLHI	R7,8		MST19110
001FOA	2086	1912		BLS	INI.1		MST19120
		1913	*				MST19130
001FOC	2415	1914		LIS	R1,5		MST19140
001FOE	D360 17A3	1915		LB	R6,INTLEV+7		MST19150
001F12	D261 180E	1916	INI.2	STB	R6,INTLVL(R1)		MST19160
001F16	2711	1917		SIS	R1,1		MST19170
001F18	2213	1918		BNMS	INI.2		MST19180
		1919	*				MST19190
001F1A	2400	1920		LIS	R0,0		MST19200
001F1C	4000 0098	1921		STH	R0,X'98°	SET UP SVC NEW PSW, VECTORS.	MST19210
001F20	C800 3000	1922		LHI	R0,X'3000°		MST19220
001F24	4000 009A	1923		STH	R0,X'9A°		MST19230
001F28	C810 0012	1924		LHI	R1,18		MST19240
001F2C	4801 1952	1925	INI.3	LH	R0,SVCVECTS(R1)		MST19250
001F30	4001 009C	1926		STH	R0,X'9C°(R1)		MST19260
001F34	2712	1927		SIS	R1,2		MST19270
001F36	2215	1928		BNMS	INI.3		MST19280

## EXEC - FTPE R03P1 (W/CONDITIONAL ASSEMBLY)

		1929	*				MST19290
001F38	2411	1930		LIS	R1,1	INIT RANDOM NUMBER GENERATOR	MST19300
001F3A	4010 18C2	1931		STH	R1,RND1		MST19310
001F3E	0A11	1932		AAE	R1,R1		MST19320
001F40	4010 18C4	1933		STH	R1,RND2		MST19330
		1934	*				MST19340
001F44	C810 1F70	1935	GETMTOP	LHI	R1,FOUNDTOP	SET MM INT VECTOR	MST19350
001F48	4010 003E	1936		STH	R1,X'3E'	FOR USE IN SEARCH.	MST19360
001F4C	C810 3FFC	1937		LHI	R1,X'4000'-ADC	MINIMUM REQ'D MEMORY	MST19370
001F50	25F5	1938		LCS	R15,5	TEST PATTERN = F---FFFB	MST19380
001F52	58E1 0000	1939	TOP2	LDA	R11,0(R1)	SAVE CURRENT CONTENTS	MST19390
001F56	50F1 0000	1940		STA	R15,0(R1)	INSERT TEST PATTERN	MST19400
001F5A	50E0 0000	1941		STA	R11,0	TO CLEAR MDR	MST19410
001F5E	58E1 0000	1942		LDA	R14,0(R1)	RELOAD TEST PATTERN (?)	MST19420
001F62	05EF	1943		CLAR	R14,R15	MEMORY THERE ?	MST19430
001F64	2136	1944		BNES	FOUNDTOP	BRANCH: NO.	MST19440
001F66	50E1 0000	1945		STA	R11,0(R1)	RESTORE ORIG. DATA	MST19450
001F6A	CA10 0400	1946		AHI	R1,X'400'	ADVANCE 1KB	MST19460
001F6E	228E	1947		BNCS	TOP2	CONTINUE	MST19470
		1948	* NOTE- ASSUMES	MAX MEMORY ON 16-BIT MACHINE = 64KB.			MST19480
001F70	C800 1554	1949	FOUNDTOP	LHI	R0,MM		MST19490
001F74	4000 003E	1950		STH	R0,X'3E'	RESTORE MMINT VECTOR	MST19500
001F78	4830 0A22	1951		LH	R3,PSW2	RE-ENABLE MMINT	MST19510
001F7C	9523	1952		EPSR	R2,R3		MST19520
		1955		ELSE			MST19550
001F7E	CB10 03FC	1956		SHI	R1,X'400'-ADC	CORRECT EXCESS ADDITION	MST19560
001F82		1957		ENDC			MST19570
001F82	5010 18FC	1958		STA	R1,MMTOP	EFFECTIVE TOP-OF-MEMORY	MST19580
001F86	C810 1554	1959		LHI	R1,MM		MST19590
001F8A	4010 003E	1960		STH	R1,X'3E'	RESTORE MM INT VECTOR.	MST19600
001F8E	4300 0D16	1961		B	INITRET	RETURN	MST19610

## EXEC - FTPE RO3P1 (W/CONDITIONAL ASSEMBLY)

		1963	*	*****					MST19630
		1964	*						MST19640
		1965	*	TO INITIALIZE DEDICATED DEVICE ADDRESS REGISTERS.					MST19650
		1966	*	TO PUT DEVICES IN INITIAL STATES, TEST MODULE OPTIONS.					MST19660
		1967	*	CALLING SEQUENCE BAL RETN,MODINIT					MST19670
		1968	*	DCX MODULEFLAGS					MST19680
		1969	*						MST19690
		1970	*	MODULE FLAGS HAVE THE FOLLOWING MEANINGS:					MST19700
		1971	*	BIT 15 - REQUIRES TRACK EVALUATION					MST19710
		1972	*	BIT 14 - NO ABORT (SCOPE LOOPS)					MST19720
		1973	*	BIT 13 - 65 SECTORS/TRACK ALLOWED					MST19730
		1974	*	BIT 12 - SECONDARY DRIVE TO BE USED					MST19740
		1975	*	BIT 11 - READ-ONLY/TEST DATA SCOPE OPTIONS DISALLOWED					MST19750
		1976	*	BIT 10 - NO HEADS MAY BE DELETED					MST19760
		1977	*	BIT 09 - SECNUM > X'3F' ALLOWED.					MST19770
		1978	*	BIT 08 - REQUIRES 'TSECT' INITIALIZATION					MST19780
		1979	*	BIT 00 - REFORMAT IN PROGRESS					MST19790
		1980	*						MST19800
	001F92	480F 0000	1981	MODINIT LH	RO,0(RETN)	LOAD MODULE FLAGS			MST19810
	001F96	4810 15CA	1982	LH	R1,BTESTNO				MST19820
	001F9A	4330 1FE4	1983	BZ	MOD.3	BRANCH: TEST 0 NEED NOT CHECK FLAGS			MST19830
	001F9E	C300 0010	1984	THI	RO,X'0010'	SCOPE 1 & 3 ILLEGAL ?			MST19840
	001FA2	2336	1985	BZS	MOD.1	BRANCH: ACCEPTABLE.			MST19850
	001FA4	2411	1986	LIS	R1,1				MST19860
	001FA6	4410 1742	1987	NH	R1,SCOPE+6				MST19870
	001FAA	4230 1D60	1988	BNZ	ERROR9	INVALID SCOPE OPTION			MST19880
	001FAE	C300 0020	1989	MOD.1 THI	RO,X'0020'	ARE HEADS ALLOWED TO BE DELETED ?			MST19890
	001FB2	4230 1FD8	1990	BNZ	MOD.2	BRANCH: NO.			MST19900
	001FB6	4810 1766	1991	LH	R1,SECNUM+6				MST19910
	001FBA	2611	1992	AIS	R1,1	SET TO EVEN-POWER-OF-2			MST19920
	001FBC	C820 FF80	1993	LHI	R2,X'FF80'	CORRESPONDING MASK -			MST19930
	001FC0	C300 0040	1994	THI	RO,X'40'	GREATER THAN 1 TRACK XFER ALLOWED ?			MST19940
	001FC4	2333	1995	BZS	MOD.1A	BRANCH: NO.			MST19950
	001FC6	C820 0000	1996	LHI	R2,0	MAX LIMIT MASK -			MST19960
	001FCA	C312 0000	1997	MOD.1A THI	R1,0(R2)				MST19970
	001FCE	4230 1D36	1998	BNZ	ERROR1	INVALID SECNUM OPTION			MST19980
	001FD2	C510 0041	1999	CLHI	R1,MAXSEC+1	MORE THAN 1 TRACK ?			MST19990
	001FD6	2187	2000	BLS	MOD.3	BRANCH: NO.			MST20000
	001FD8	4810 18D4	2001	MOD.2 LH	R1,HEADSA				MST20010
	001FDC	4610 18D6	2002	OH	R1,HEADSA+2	ANY HEADS DELETED ?			MST20020
	001FE0	4230 1D8E	2003	BNZ	ERROR16	INVALID 'HEADS' OPTION			MST20030
	001FE4	4000 18BA	2004	MOD.3 STH	RO,FLAGS				MST20040
	001FEB	26F2	2005	AIS	REIN,2	ADVANCE PAST MODULE FLAGS			MST20050
	001FEA	50F0 1944	2006	STA	REIN,TEMPB	WILL GO TO 'RERN'			MST20060
	001FEE	4800 171E	2007	LH	RO,RETRY+6				MST20070
	001FF2	4000 18C8	2008	STH	RO,RRCTR	INITIALIZE TO MAX RETRIES			MST20080
			2009	*					MST20090
	001FF6	2400	2010	LIS	RO,0				MST20100
	001FF8	241A	2011	LIS	R1,10				MST20110
	001FFA	4001 1802	2012	MOD.4 STH	RO,DEVINT(R1)	REMOVE INTPT VECTORS			MST20120
	001FFE	2712	2013	SIS	R1,2				MST20130
	002000	2213	2014	BNMS	MOD.4				MST20140
			2015	*					MST20150
	002002	D200 189A	2016	STB	RO,OFFCMD	NO OFFSETS			MST20160

## EXEC - ETPE R03P1 (W/CONDITIONAL ASSEMBLY)

002006	4000	18CC	2017		STH	RO,OPCODE	=TESTING INITIAL STATUS	MST20170
00200A	4000	15BC	2018		STH	RO,ISITERR		MST20180
00200E	5000	193C	2019		STA	RO,ERRFLG		MST20190
002012	5000	1938	2020		STA	RO,RXERFL		MST20200
			2021	*				MST20210
002016	4840	16EE	2022		LH	SLAD,SELCH+6		MST20220
00201A	4830	16FA	2023		LH	DCAD,DISCON+6		MST20230
00201E	4850	18E8	2024		LH	FUT,FUTADRS		MST20240
002022	4050	18C6	2025		STH	FUT,STATE	SET 'STATE' = MAIN DRIVE	MST20250
002026	DE40	18A3	2026		OC	SLAD,STOP		MST20260
00202A	DE30	189E	2027		OC	DCAD,RESET		MST20270
			2028	*				MST20280
00202E	41F0	2032	2029		BAL	R15,MOD.4A		MST20290
002032	50F0	1934	2030	MOD.4A	STA	R15,RERN	FOR MODINIT ERRORS -	MST20300
002036	24D0		2031		LIS	SECT,0		MST20310
002038	40D0	18DC	2032		STH	SECT,CURSECT		MST20320
00203C	24B0		2033		LIS	TRACK,0		MST20330
00203E	40B0	18E2	2034		STH	TRACK,CURCYL		MST20340
002042	40B0	18E0	2035		STH	TRACK,HEAD	HEAD 0	MST20350
002046	41F0	3438	2036		BAL	R15,SETHEAD	SET HEAD	MST20360
00204A	DE50	189D	2037		OC	FUT,CLEAR	CLEAR FAULT	MST20370
00204E	41E0	347C	2038		BAL	R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST20380
002052	000F		2039		DCX	000F		MST20390
002054	9D5A		2040		SSR	FUT,STAT		MST20400
002056	2323		2041		BFFS	SEEKINC,MOD.5		MST20410
002058	41F0	368E	2042		BAL	R15,RESTORE		MST20420
00205C	48B0	16B2	2043	MOD.5	LH	TRACK,LOCYL+6		MST20430
002060	4800	18BA	2044		LH	RO,FLAGS	RELOAD MODULE FLAGS:	MST20440
002064	C300	0081	2045		THI	RO,X'0081'	TEST TSECT, EVALUATE BITS	MST20450
002068	2333		2046		BZS	MOD.6	BRANCH: NO SEEK REQUIRED.	MST20460
00206A	4190	363C	2047		BAL	WK3,TSECT	GET CYLINDER, HEAD, SECTOR	MST20470
00206E	4800	18BA	2048	MOD.6	LH	RO,FLAGS		MST20480
002072	910F		2049		SLHLS	RO,15	EXTRACT EVALUATION BIT	MST20490
002074	2338		2050		BZS	MOD.7		MST20500
002076	4800	17AE	2051	TESTAUTO	LH	RO,NOAUTO+6	ARE PRE-EVAL & POST-FMT INHIBITED ?	MST20510
00207A	2135		2052		BNZS	MOD.7	BRANCH: YES.	MST20520
00207C	41F0	37C2	2053		BAL	R15,TENSECT	EVALUATE TRACK	MST20530
002080	D3D0	16CB	2054		LB	SECT,SECTOR+7		MST20540
002084	58F0	1944	2055	MOD.7	LDA	R15,TENPB		MST20550
002088	50F0	1934	2056		STA	R15,RERN	RERUN ADDRESS	MST20560
00208C	030F		2057		BR	R15	RETURN TO CALLER.	MST20570

## SYSTEM TEST SEQUENCES - TEST 00

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2059 * *****
2060 *
2061 *           T E S T   0
2062 *
2063 * PURPOSE OF TEST:
2064 * TEST 0 CHECKS THE STATUS OF THE SELECTOR CHANNEL, CONTRCLLR, AND
2065 * DISC DRIVE(S) TO BE USED. TEST 0 IS RUN BEFORE ALL OTHER
2066 * SELECTED TESTS, AND CANNOT BE BYPASSED.
2067 *
2068 * ASSUMPTIONS:
2069 * THE DISC DRIVE MUST BE ON-LINE AND NOT WRITE-PROTECTED; THE DRIVE
2070 * MUST NOT BE RESERVED TO THE ALTERNATE CHANNEL.
2071 * IT IS ASSUMED THAT THE PROCESSOR, SELCH, MEMORY, AND CONSOLE I/O
2072 * TESTS HAVE BEEN RUN SUCCESSFULLY, PRIOR TO SELECTING THIS TEST.
2073 *
2074 * DESIGN SPECIFICATIONS:
2075 * TO RUN TEST 0 WITH NO ERRORS,
2076 *     1) THE SELCH MUST NOT BE BUSY FOLLOWING A 'STOP' COMMAND.
2077 *     2) CONTROLLER 'BUSY' AND 'IDLE' STATUS BITS, ONLY, MUST BE SET
2078 *     3) ALL DISC DRIVE STATUS BITS MUST BE RESET.
2079 *
2080 * HOW TO RUN THE TEST:
2081 * ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE OPTIONS.
2082 * SELECT THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.
2083 *
2084 * OPTIONS:
2085 * LOOP, CONTIN, SELCH, DISCON, DRIVE
2086 *
2087 * ERRORS:
2088 * 000000 - 00FFFF

```

```

00208E 41F0 1F92      2090 TEST0  BAL  RETN,MODINIT      MST20900
002092 0000          2091          DCX  0              NO SPECIAL FLAGS      MST20910
002094 4850 18E8      2092          LH   FUT,FUTADRS      MST20920
002098 4050 18C6      2093          STH  FUT,STATE        MST20930
00209C E110 3DC8      2094          SVC  1,PBLK01         TEST SELCH NOT BUSY    MST20940
0020A0 E120 3DCC      2095          SVC  2,PBLK02         TEST CTRLR STATUS = X'0A' OR X'0B'  MST20950
0020A4 E130 3DD0      2096          SVC  3,PBLK03         TEST DRIVE STATUS NOT = X'20'      MST20960
0020A8 E130 3DD4      2097          SVC  3,PBLK04         TEST DRIVE STATUS = X'00'         MST20970
0020AC 2408          2098          LIS  R0,X'0008'      BIT FOR TEST0C         MST20980
0020AE 4400 16A6      2099          NH   R0,TEST+6      WILL TEST 0C BE RUN ?  MST20990
0020B2 233B          2100          BZS  TST0.1         BRANCH: NO.            MST21000
0020B4 4850 18EA      2101          LH   FUT,SECFILAD   MST21010
0020B8 4050 18C6      2102          STH  FUT,STATE        MST21020
0020BC E120 3DCC      2103          SVC  2,PBLK02         TEST CTRLR STATUS = X'0A' OR X'0B'  MST21030
0020C0 E130 3DD0      2104          SVC  3,PBLK03         TEST XFILE STATUS NOT X'20'      MST21040
0020C4 E130 3DD4      2105          SVC  3,PBLK04         TEST XFILE STATUS X'00'         MST21050
0020C8 4300 0E3A      2106 TEST0.1  B    KEEP7         RUN ONCE ONLY.        MST21060

```



## SYSTEM TEST SEQUENCES - TEST 01

```

2108 * *****
2109 *
2110 *           T E S T   1
2111 *
2112 * PURPOSE OF TEST:
2113 * TEST 1 PERFORMS A SIMPLE CHECK OF THE SEEK AND RESTORE FUNCTIONS.
2114 * ALSO CHECKS SERVO OFFSET PLUS/MINUS.
2115 *
2116 * ASSUMPTIONS:
2117 * THE DISC DRIVE MUST BE ON-LINE, AND NOT RESERVED TO THE ALTERNATE
2118 * CHANNEL. THE DISC PACK MUST BE FORMATTED IF BYCKAD = 0.
2119 *
2120 * DESIGN SPECIFICATIONS:
2121 * THE TEST SEQUENCE FOLLOWS:
2122 *     1) THE HEADS ARE RESTORED TO CYLINDER 0.
2123 *     2) THE MOST SIGNIFICANT VALID CYLINDER ADDRESS BIT
2124 *        IS SET, AND A SEEK IS MADE TO THAT CYLINDER.
2125 *        THE CYLINDER ADDRESS IS THEN DIVIDED BY 2 (SETTING
2126 *        THE NEXT LEAST-SIGNIFICANT BIT), AND THE PROCESS IS
2127 *        REPEATED, UNTIL CYLINDER 1 IS REACHED.
2128 *        (A RESTORE IS PERFORMED BEFORE EACH SEEK.)
2129 *     3) THE HEADS ARE THEN RESTORED TO CYLINDER 0, AND
2130 *        A SEEK IS MADE TO THE MAXIMUM CYLINDER ADDRESS.
2131 *     4) THE HEADS ARE RESTORED TO CYLINDER 0, AND A SEEK
2132 *        IS MADE TO THAT CYLINDER.
2133 *     5) A SEEK IS MADE TO AN INVALID CYLINDER ADDRESS,
2134 *        EXPECTING SEEK-INCOMPLETE STATUS.
2135 *     6) SERVO OFFSET PLUS/MINUS ARE COMMANDED.
2136 *
2137 *     A READ-CHECK IS PERFORMED FOLLOWING EACH SEEK OR
2138 *     RESTORE, IN STEPS 1 THROUGH 4, UNLESS 'BYCKAD' = 1.
2139 *     THE SECTOR SPECIFIED BY THE 'SECTOR' OPTION IS USED.
2140 *
2141 * HOW TO RUN THE TEST:
2142 * ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE OPTIONS,
2143 * SELECT THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.
2144 *
2145 * OPTIONS:
2146 * LOOP, CONTIN, DISCON, DRIVE, BYCKAD, PACTYP, SECTOR, OFFSET
2147 *
2148 * ERRORS:
2149 * 010000 - 01FFFF
2150 *
0020CC 41F0 1F92 2151 TEST1 BAL RETN,MODINIT
0020D0 0080 2152 DCX 0080 TSECT
0020D2 C8E0 0200 2153 LHI TRACK,X'200' MOST SIGNIF. BIT OF CYL ADRS
0020D6 40E0 1940 2154 TST1.1 STH TRACK,TEMPA
0020DA 41F0 368E 2155 BAL R15,RESTORE RESTORE TO CYLINDER 0
0020DE 41F0 36C6 2156 BAL RETN,CKADSR READ CHECK
0020E2 43E0 1940 2157 LH TRACK,TEMPA
0020E6 41FC 33DA 2158 BAL RETN,ILLADD CHECK FOR INVALID CYLINDERS
0020EC 00C0 20F8 2159 DAC TST1.2 BYPASS DESTINATION
0020F0 41F0 361A 2160 BAL RETN,SKSR SEEK SELECTED CYLINDER
0020F4 41FC 36C6 2161 BAL RETN,CKADSR CHECK ADDRESS
MST21080
MST21090
MST21100
MST21110
MST21120
MST21130
MST21140
MST21150
MST21160
MST21170
MST21180
MST21190
MST21200
MST21210
MST21220
MST21230
MST21240
MST21250
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MST21270
MST21280
MST21290
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MST21430
MST21440
MST21450
MST21460
MST21470
MST21480
MST21490
MST21500
MST21510
MST21520
MST21530
MST21540
MST21550
MST21560
MST21570
MST21580
MST21590
MST21600
MST21610

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## SYSTEM TEST SEQUENCES - TEST 01

0020F8	10P1	2162	TST1.2	SRLS	TRACK,1	NEXT BINARY SUBMULTIPLE	MST21620
0020FA	4230 20D6	2163		BNZ	TST1.1	CONTINUE	MST21630
		2164	*				MST21640
0020FE	41F0 363F	2165		BAL	R15,RESTORE	RESTORE	MST21650
002102	41F0 36C6	2166		BAL	RETN,CKADSR		MST21660
002106	48B0 19B4	2167		LH	TRACK,MAXCYL	TO SEEK HIGHEST CYLINDER	MST21670
00210A	27E1	2168		SIS	TRACK,1		MST21680
00210C	41F0 361A	2169		BAL	RETN,SKSR		MST21690
002110	41F0 36C6	2170		BAL	RETN,CKADSR		MST21700
002114	41F0 368E	2171		BAL	R15,RESTORE		MST21710
002118	41F0 361A	2172		BAL	RETN,SKSR	SEEK CYLINDER 0	MST21720
00211C	41F0 36C6	2173		BAL	RETN,CKADSR	CHECK ADDRESS	MST21730
		2174	*				MST21740
002120	48B0 19B4	2175		LH	TRACK,MAXCYL		MST21750
002124	41F0 3422	2176		BAL	R15,SETCYL		MST21760
002128	DE50 189F	2177		OC	FUT,SEEK		MST21770
00212C	C8C0 0021	2178		LHI	OPKEY,X'21'		MST21780
002130	40C0 18CC	2179		STH	OPKEY,OPCODE	=SEEKING ILLEGAL CYLADRS	MST21790
002134	E130 3DD8	2180		SVC	3,PBLK05	TEST SEEKINC SET BY INVALID CYLADRS	MST21800
002138	41F0 368E	2181		BAL	R15,RESTORE		MST21810
00213C	E130 3DDC	2182	TST1.4	SVC	3,PBLK06	TEST SEEKINC RESET BY RESTORE	MST21820
		2183	*				MST21830
002140	D300 18AE	2184		LB	RO,CMD.38	SERVO OFFSET PLUS	MST21840
002144	41F0 2166	2185		BAL	R15,OFSS		MST21850
002148	DE50 18A8	2186		OC	FUT,CMD.30	REQUIRED BY DRIVE INTERNALS	MST21860
00214C	D300 18AB	2187		LB	RO,CMD.34	SERVO OFFSET MINUS	MST21870
002150	41F0 2166	2188		BAL	R15,OFSS		MST21880
002154	D300 18A8	2189		LB	RO,CMD.30		MST21890
002158	D200 189A	2190		STB	RO,OFFCMD		MST21900
00215C	9E50	2191		OCR	FUT,RO	OFFSETS NOMINAL.	MST21910
00215E	41F0 361A	2192		BAL	RETN,SKSR	RE-SEEK CYLINDER	MST21920
002162	4300 0E1C	2193		B	TSTEND	EXIT	MST21930
002166	9E50	2195	OFSS	OCR	FUT,RO	SEND OFFSET COMMAND	MST21950
002168	D200 189A	2196		STB	RO,OFFCMD		MST21960
00216C	C8C0 0040	2197		LHI	OPKEY,X'40'		MST21970
002170	40C0 18CC	2198		STH	OPKEY,OPCODE	=TESTING OFFSETS	MST21980
002174	E130 3DE0	2199		SVC	3,PBLK07	EXPECT DRIVE NOT READY	MST21990
002178	41F0 34BC	2200		BAL	R14,DWAIT	WAIT FOR DRIVE READY	MST22000
00217C	0014	2201		DCX	0014		MST22010
00217E	E130 3DD0	2202		SVC	3,PBLK03	TEST DRIVE STATUS = X'00'	MST22020
002182	E120 3E18	2203		SVC	2,PBLK21	TEST CTRLR STATUS = X'0A'	MST22030
002186	030F	2204		BR	R15	RETURN	MST22040

## SYSTEM TEST SEQUENCES - TEST 02

		2206	*	*****		MST22060
		2207	*			MST22070
		2208	*	T E S T 2		MST22080
		2209	*			MST22090
		2210	*	PURPOSE OF TEST:		MST22100
		2211	*	TEST 2 PERFORMS AN EXHAUSTIVE CHECK OF THE HEAD-POSITICNING SERVO.		MST22110
		2212	*			MST22120
		2213	*	ASSUMPTIONS:		MST22130
		2214	*	THE DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE		MST22140
		2215	*	CHANNEL. THE DISC PACK MUST BE FORMATTED IF BYCKAD = 0.		MST22150
		2216	*			MST22160
		2217	*	DESIGN SPECIFICATIONS:		MST22170
		2218	*	FOLLOWING A RESTORE TO CYLINDER 0, A SENSE-STATUS SEEK IS MADE		MST22180
		2219	*	TO THE MAXIMUM VALID CYLINDER ADDRESS. SEEKS ARE THEN MADE TO		MST22190
		2220	*	CYLINDERS 1 AND (MAX-1). THE PROCESS REPEATS UNTIL ALL SEEKS ARE		MST22200
		2221	*	NEAR THE CENTER OF THE RANGE, THEN CONTINUES AS THE RANGE EXPANDS.		MST22210
		2222	*	THE TEST TERMINATES WHEN MAXIMUM RANGE HAS BEEN REACHED.		MST22220
		2223	*			MST22230
		2224	*	A READ-CHECK IS PERFORMED ON THE HEAD AND SECTOR SPECIFIED		MST22240
		2225	*	BY THE 'SECTOR' OPTION, FOR ALL CYLINDERS, IF 'BYCKAD' = 0.		MST22250
		2226	*			MST22260
		2227	*	HOW TO RUN THE TEST:		MST22270
		2228	*	ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE OPTIONS,		MST22280
		2229	*	SELECT THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.		MST22290
		2230	*			MST22300
		2231	*	OPTIONS:		MST22310
		2232	*	LOOP, CGTIN, DISCON, DRIVE, BYCKAD, PACTYP, SECTOR		MST22320
		2233	*			MST22330
		2234	*	ERRORS:		MST22340
		2235	*	020000 - 02FFFF		MST22350
		2236	*			MST22360
002188	41F0 1F92	2237	TEST2	BAL RETN,MODINIT		MST22370
00218C	0080	2238		DCX 0080	TSECT	MST22380
00218E	41F0 368E	2239		BAL R15,RESTORE	RESTORE TO CYL 0	MST22390
002192	2460	2240		LIS WK0,0	IF 0: SEEK (WK2); ELSE SEEK (WK1).	MST22400
002194	2571	2241		LCS WK1,1	ASCENDING CYLINDERS	MST22410
002196	4880 18B4	2242		LH WK2,MAXCYL	DESCENDING CYLINDERS	MST22420
00219A	2781	2243	OSCT1	SIS WK2,1		MST22430
00219C	4210 0E1C	2244		BH TSTEND		MST22440
0021A0	08E8	2245		LDAR TRACK,WK2		MST22450
0021A2	41F0 33DA	2246	OSCT2	BAL RETN,ILLADD	CHECK CE PACK INVALID ADDRESS	MST22460
0021A8	0000 21B4	2247		DAC OSCT3	BYPASS DESTINATION	MST22470
0021AC	41F0 361A	2248		BAL RETN,SKSR	SEEK CYLINDER, IF NOT VOID	MST22480
0021B0	41F0 36C6	2249		BAL RETN,CKADSR	DO READ CHECK	MST22490
0021B4	C760 FFFF	2250	OSCT3	XHI WK0,-1	CHANGE SENSE OF SEEK	MST22500
0021B8	4310 219A	2251		BHM OSCT1	BRANCH: SEEK DESCENDING	MST22510
0021BC	2671	2252		AIS WK1,1		MST22520
0021BE	08E7	2253		LDAR TRACK,WK1		MST22530
0021C0	22CF	2254		BS OSCT2	SEEK ASCENDING.	MST22540

SYSTEM TEST SEQUENCES - TEST 03

		2256	*	*****					MST22560
		2257	*						MST22570
		2258	*						MST22580
		2259	*	T E S T	3				MST22590
		2260	*	PURPOSE OF TEST:					MST22600
		2261	*	TEST 3 PERFORMS SEEKS TO RANDOM CYLINDERS BETWEEN LOCYL AND HICYL.					MST22610
		2262	*	DESIGNED TO DISCOVER ERRORS NOT DETECTED BY TESTS 1 AND 2.					MST22620
		2263	*						MST22630
		2264	*	ASSUMPTIONS:					MST22640
		2265	*	THE DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE					MST22650
		2266	*	CHANNEL. THE DISC PACK MUST BE FORMATTED IF BYCKAD = 0.					MST22660
		2267	*						MST22670
		2268	*	DESIGN SPECIFICATIONS:					MST22680
		2269	*	ONE THOUSAND SEEKS ARE MADE TO RANDOM CYLINDER ADDRESSES					MST22690
		2270	*	SUPPLIED BY A FIBONACCI GENERATOR.					MST22700
		2271	*	SEEK ADDRESSES NOT ALLOWED TO EXCEED THE HICYL OPTION SPECIFIED.					MST22710
		2272	*	NOR TO BE LESS THAN SPECIFIED LOCYL OPTION.					MST22720
		2273	*	A READ-CHECK IS PERFORMED ON THE HEAD AND SECTOR SPECIFIED BY					MST22730
		2274	*	THE 'SECTOR' OPTION AFTER EACH SEEK, UNLESS THE 'BYCKAD'					MST22740
		2275	*	OPTION = 0.					MST22750
		2276	*						MST22760
		2277	*	HOW TO RUN THE TEST:					MST22770
		2278	*	ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE OPTIONS,					MST22780
		2279	*	AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.					MST22790
		2280	*						MST22800
		2281	*	OPTIONS:					MST22810
		2282	*	LOOP, CONTIN, DISCON, DRIVE, BYCKAD, PACTYP, LOCYL, HICYL,					MST22820
		2283	*	SECTOR					MST22830
		2284	*						MST22840
		2285	*	ERRORS:					MST22850
		2286	*	030000 - 03FFFF					MST22860
		2287	*						MST22870
0021C2	41F0	1F92		TEST3	BAL	RETN,MODINIT			MST22880
0021C6	0080				DCX	0080	TSECT		MST22890
0021C8	C800	03E8			LHI	R0,1000	SET FOR 1000		MST22900
0021CC	40C0	18E6			STH	R0,COUNTER			MST22910
0021D0	41F0	372C		TST3.1	BAL	RETN,RAND	RANDOM SEEKS		MST22920
0021D4	C460	0FFF			NHI	WK0,X'0FFF'			MST22930
0021D8	1062				SRLS	WK0,2			MST22940
0021DA	4960	16BE			CH	WK0,HICYL+6	NOT TO EXCEED MAX		MST22950
0021DE	2027				BPS	TST3.1			MST22960
0021E0	4560	16B2			CLH	WK0,LOCYL+6			MST22970
0021E4	208A				BLS	TST3.1			MST22980
0021E6	08F6				LDAR	TRACK,WK0	TO REG TRACK		MST22990
0021E8	41F0	33DA			BAL	RETN,ILLADD	VOID AREAS		MST23000
0021EC	00C0	21D0			DAC	TST3.1	BYPASS DESTINATION		MST23010
0021F0	41F0	351A			BAL	RETN,SKSR	SEEK		MST23020
0021F4	41F0	35C6			BAL	RETN,CKADSR	READ CHECK		MST23030
0021F8	41F0	37AC			BAL	R15,CNTDOWN	CONTINUE, OR EXIT		MST23040
0021FC	00C0	21D0			DAC	TST3.1	CONTINUATION VECTOR		MST23050

## SYSTEM TEST SEQUENCES - TEST 04

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2307 * *****
2308 *
2309 *           T E S T   4
2310 *
2311 * PURPOSE OF TEST:
2312 * TEST 4 PERFORMS A SIMPLE CHECK OF THE SEEK COMPLETE INTERRUPT LOGIC.
2313 *
2314 * ASSUMPTIONS:
2315 * THE DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE
2316 * CHANNEL.
2317 *
2318 * DESIGN SPECIFICATIONS:
2319 * THE HEADS ARE RESTORED TO CYLINDER 0. AN INTERRUPT VECTOR IS
2320 * SET UP, AND AN INTERRUPT SEEK IS MADE TO CYLINDER 0. AN INTERRUPT
2321 * SEEK TO THE MAXIMUM VALID CYLINDER ADDRESS IS THEN PERFORMED.
2322 * A SEEK IS THEN ATTEMPTED TO AN INVALID CYLINDER ADDRESS, EXPECTING
2323 * AN INTERRUPT WITH SEEK INCOMPLETE STATUS.
2324 * THE RESTORE INTERRUPT IS THEN TESTED, FOLLOWED BY SERVO OFFSET
2325 * INTERRUPT TESTING. THE TEST THEN TERMINATES.
2326 * NOTE - NO READ CHECKS ARE PERFORMED ON ANY CYLINDER.
2327 *
2328 * HOW TO RUN THE TEST:
2329 * ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE OPTIONS,
2330 * AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.
2331 *
2332 * OPTIONS:
2333 * LOOP, CONTIN, DISCON, DRIVE, PACTYP, OFFSET
2334 *
2335 * ERRORS:
2336 * 040000 - 04FFFF
2337 *
002200 41F0 1F92 2338 TEST4 BAL RETN,MODINIT
002204 0000 2339 DCX 0000 NO SPECIAL FLAGS
002206 41F0 368E 2340 BAL R15,RESTORE
00220A 41E0 38CE 2341 BAL R14,INSERT ESTAB. DRIVE INTPT. VECTOR:
00220E 18E8 2342 DC Z(FUTADRS),Z(SKINTA) MST23420
002210 31E6
002212 41E0 31BE 2343 BAL RETN2,INTSK SEEK CYLINDER 0
002216 48E0 18B4 2344 LH TRACK,MAXCYL NOW SEEK MAX CYL
00221A 27E1 2345 SIS TRACK,1 MST23450
00221C 41E0 31BE 2346 BAL RETN2,INTSK
002220 41E0 31BE 2347 BAL RETN2,INTSK SEEK MAX AGAIN
2348 * MST23480
002224 48E0 18B4 2349 LH TRACK,MAXCYL MST23490
002228 41E0 31BE 2350 BAL RETN2,INTSK MST23500
00222C C8C0 0021 2351 TST4.1 LHI OPKEY,X'21' =SEEKING ILLEGAL CYLADRS MST23510
002230 40C0 18CC 2352 STH OPKEY,OPCODE MST23520
002234 E1C0 3DD8 2353 SVC 0,PBLK05 SEEKING SET BY INVALID CYLADRS ? MST23530
002238 E130 3DD8 2354 SVC 3,PBLK05 TEST CURRENT STATUS, ALSO MST23540
00223C DE5C 18A2 2355 OC FUT,IRESTOC INTERRUPT RESTORE MST23550
002240 C8C0 0031 2356 LHI OPKEY,X'31' =RESTORE FOLLOWING SEEK INCOMPLETE MST23560
002244 40C0 18CC 2357 STH OPKEY,OPCODE MST23570
002248 41E0 31D8 2358 BAL RETN2,INTSK3 WAIT FOR RESTORE INTERRUPT. MST23580
00224C 0616 2359 DCX 06D6 MST23590

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## SYSTEM TEST SEQUENCES - TEST 04

00224E	24B0	2360	LIS	TRACK,0		MST23600
002250	40E0 18E2	2361	STH	TRACK,CURCYL		MST23610
002254	E1C0 3DD4	2362	SVC	0,PBLK04	TEST SEEKING+BSY RESET (INTPT)	MST23620
002258	E130 3DD4	2363	SVC	3,PBLK04	TEST AGAIN (SSR)	MST23630
00225C	C800 3100	2365	LHI	R0,256		MST23650
002250	40C0 18E6	2366	STH	R0,COUNTER		MST23660
		2367	*			MST23670
002264	C8C0 0040	2368	LHI	OPKEY,X'40'	=TESTING SERVO/STROBE OFFSETS	MST23680
002268	40C0 18CC	2369	STH	OPKEY,OPCODE		MST23690
00226C	D300 18AA	2370	LB	R0,CMD.32	STROBE +	MST23700
002270	9E50	2371	OCR	FUT,R0		MST23710
002272	41F0 2328	2372	BAL	R15,TESTAT	TEST RESULTING STATUSES	MST23720
002276	D300 18A9	2373	LB	R0,CMD.31	STROBE -	MST23730
00227A	9E50	2374	OCR	FUT,R0		MST23740
00227C	41F0 2328	2375	BAL	R15,TESTAT		MST23750
002280	D300 18AC	2376	LB	R0,CMD.35	SERVO - STROBE -	MST23760
002284	D200 189A	2377	STB	R0,OFFCMD		MST23770
002288	9E50	2378	OCR	FUT,R0		MST23780
00228A	41E0 31D8	2379	BAL	R14,INTSK3	WAIT FOR INTERRUPT, TEST STATUS	MST23790
00228E	00FF	2380	DCX	00FF	TIMEOUT CONSTANT	MST23800
002290	41F0 232C	2381	BAL	R15,TESTAT1	TEST STATUSES	MST23810
002294	DE50 18A8	2382	OC	FUT,CMD.30	OFFSETS NOMINAL	MST23820
002298	D300 18AF	2383	LB	R0,CMD.39	SERVO + STROBE -	MST23830
00229C	D200 189A	2384	STB	R0,OFFCMD		MST23840
0022A0	9E50	2385	OCR	FUT,R0		MST23850
0022A2	41E0 31D8	2386	BAL	R14,INTSK3		MST23860
0022A6	00FF	2387	DCX	00FF		MST23870
0022A8	41F0 232C	2388	BAL	R15,TESTAT1		MST23880
0022AC	DE50 18A8	2389	OC	FUT,CMD.30	OFFSETS NOMINAL	MST23890
0022B0	D300 18AB	2390	LB	R0,CMD.34	SERVO -	MST23900
0022B4	D200 189A	2391	STB	R0,OFFCMD		MST23910
0022B8	9E50	2392	OCR	FUT,R0		MST23920
0022BA	41E0 31D8	2393	BAL	R14,INTSK3		MST23930
0022BE	00FF	2394	DCX	00FF		MST23940
0022C0	41F0 232C	2395	BAL	R15,TESTAT1		MST23950
0022C4	DE50 18A8	2396	OC	FUT,CMD.30	OFFSETS NOMINAL	MST23960
0022C8	D300 18AE	2397	LB	R0,CMD.38	SERVO +	MST23970
0022CC	D200 189A	2398	STB	R0,OFFCMD		MST23980
0022D0	9E50	2399	OCR	FUT,R0		MST23990
0022D2	41E0 31D8	2400	BAL	R14,INTSK3		MST24000
0022D6	00FF	2401	DCX	00FF		MST24010
0022D8	41F0 232C	2402	BAL	R15,TESTAT1		MST24020
0022DC	DE50 18A8	2403	OC	FUT,CMD.30	OFFSETS NOMINAL	MST24030
0022E0	D300 18AD	2404	LB	R0,CMD.36	SERVO - STROBE +	MST24040
0022E4	D200 189A	2405	STB	R0,OFFCMD		MST24050
0022E8	9E50	2406	OCR	FUT,R0		MST24060
0022EA	41E0 31D8	2407	BAL	R14,INTSK3		MST24070
0022EE	00FF	2408	DCX	00FF		MST24080
0022F0	41F0 232C	2409	BAL	R15,TESTAT1		MST24090
0022F4	DE50 18A8	2410	OC	FUT,CMD.30	OFFSETS NOMINAL	MST24100
0022F8	D300 18B0	2411	LB	R0,CMD.3A	SERVO + STROBE +	MST24110

## SYSTEM TEST SEQUENCES - TEST 04

0022FC	D200 189A	2412	STB	RO,OFFCMD		MST24120
002300	9E50	2413	OCR	FUT,RO		MST24130
002302	41E0 31D8	2414	BAL	R14,INTSK3		MST24140
002306	00FF	2415	DCX	00FF		MST24150
002308	41F0 232C	2416	BAL	R15,TESTAT1		MST24160
00230C	D300 18A8	2417	LB	RO,CMD.30	OFFSETS NOMINAL	MST24170
002310	D200 189A	2418	STB	RO,OFFCMD		MST24180
002314	9E50	2419	OCR	FUT,RO		MST24190
002316	41E0 31BE	2420	BAL	R14,INTSK	RESEEK NOMINAL	MST24200
00231A	41F0 232C	2421	BAL	R15,TESTAT1		MST24210
00231E	41F0 37AC	2422	BAL	R15,CHTDOWN	LOOP, OR EXIT.	MST24220
002324	0000 2264	2423	DAC	TST4.2	CONTINUATION VECTOR	MST24230
002328	D200 189A	2425	TESTAT	STB	RO,OFFCMD	MST24250
00232C	50F0 2340	2426	TESTAT1	STA	R15,SAVE	MST24260
002330	E130 3DD4	2427		SFC	3,PBLK0*	MST24270
002334	E120 3E18	2428		SFC	2,PBLK2*	MST24280
002338	58F0 2340	2429		LDA	R15,SAVE	MST24290
00233C	030F	2430		BR	R15	MST24300
002340	0000 0000	2432	SAVE	DAC	0	MST24320

## SYSTEM TEST SEQUENCES - TEST 05

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2434 * *****
2435 *
2436 *           T E S T   5
2437 *
2438 * PURPOSE OF TEST:
2439 * TEST 5 PERFORMS A SIMPLE CHECK OF FORMAT-MODE READ/WRITE FUNCTION,
2440 * AND SYNTHESIZES NORMAL-MODE READ/WRITE ERRORS.
2441 *
2442 * ASSUMPTIONS:
2443 * THE DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE
2444 * CHANNEL. THE DISC PACK MUST BE PROPERLY FORMATTED ON THE CYLINDER
2445 * SPECIFIED BY THE LOCYL OPTION. THE DISC CONTROLLER MUST BE IN THE
2446 * FORMAT MODE. AN ATTEMPT IS MADE TO RESTORE PROPER FORMAT WHEN
2447 * TEST 5 TERMINATES.
2448 *
2449 * DESIGN SPECIFICATIONS:
2450 * A SEEK IS MADE TO 'LOCYL', AND ALL 65 SECTORS OF THE TRACK SPECIFIED
2451 * BY THE HEAD BYTE OF THE 'SECTOR' OPTION ARE EVALUATED FOR DEFECTIVE
2452 * SECTOR FLAGS AND SECTOR ALTERNATION. THE TEST THEN PROCEEDS
2453 * AS FOLLOWS:
2454 *
2455 * A. SECTOR 0 IS FORMATTED WITH DEF SEC SET.
2456 * B. SECTOR 2 IS FORMATTED WITH A FAULTY NORMAL
2457 *   MODE PARITY FIELD
2458 * C. SECTOR 4 IS FORMATTED WITH A FAULTY
2459 *   ADDRESS FIELD
2460 * D. SECTOR 6 IS FORMATTED PROPERLY
2461 * E. SECTOR 7 IS FORMATTED WITH A FAULTY HEAD
2462 *   BIT
2463 * F. SECTOR 8 IS FORMATTED WITH THE WRITE
2464 *   PROTECT BIT SET.
2465 * G. SECTOR 9 IS FORMATTED PROPERLY
2466 * H. SECTOR A IS FORMATTED WITH DEF SEC SET.
2467 * I. SECTOR B IS FORMATTED PROPERLY
2468 * J. SECTOR C IS FORMATTED WITH WRT PROT SET
2469 *
2470 * THE FOLLOWING NORMAL MODE READS OR WRITES
2471 * ARE THEN PERFORMED:
2472 *
2473 * A. SECTOR 0 IS READ, EXPECT DEF SEC STATUS.
2474 * B. SECTOR 2 IS READ, PARITY ERROR EXPECTED
2475 * C. SECTOR 4 IS READ, HEADER COMPARE FAILURE STATUS EXPECTED.
2476 * D. SECTORS 6 AND 7 ARE READ IN ONE DATA
2477 *   TRANSFER, HEADER COMPARE FAILURE STATUS EXPECTED.
2478 * E. SECTOR 8 IS WRITTEN WITH PROTECTED WRITE,
2479 *   WRITE PROTECT STATUS EXPECTED
2480 * F. SECTORS 9 & A ARE READ IN ONE TRANSFER
2481 *   DEFECTIVE SECTOR STATUS IS EXPECTED.
2482 * G. SECTORS 9 & A ARE WRITTEN IN ONE TRANSFER
2483 *   DEFECTIVE SECTOR STATUS IS EXPECTED.
2484 * H. SECTORS B & C ARE WRITTEN IN THE WRITE
2485 *   PROTECT MODE, WRT PROTECT STATUS EXPECTED
2486 *
2487 * FINALLY, THE ADDRESS MARK FOR SECTOR X'F' IS ERASED, AND AN ATTEMPT

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MST24340
MST24350
MST24360
MST24370
MST24380
MST24390
MST24400
MST24410
MST24420
MST24430
MST24440
MST24450
MST24460
MST24470
MST24480
MST24490
MST24500
MST24510
MST24520
MST24530
MST24540
MST24550
MST24560
MST24570
MST24580
MST24590
MST24600
MST24610
MST24620
MST24630
MST24640
MST24650
MST24660
MST24670
MST24680
MST24690
MST24700
MST24710
MST24720
MST24730
MST24740
MST24750
MST24760
MST24770
MST24780
MST24790
MST24800
MST24810
MST24820
MST24830
MST24840
MST24850
MST24860
MST24870

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## SYSTEM TEST SEQUENCES - TEST 05

		2488	*	IS MADE TO READ THE SECTOR. HEADER COMPARE FAIL IS EXPECTED.	MST24880	
		2489	*	SECTOR X'0F'S HEADER IS WRITTEN TO PHYSICAL SECTOR X'3F', AND	MST24890	
		2490	*	SECTOR X'F' IS READ IN NORMAL MODE, WITH NO ERROR EXPECTED.	MST24900	
		2491	*		MST24910	
		2492	*	PROPER FORMAT IS RESTORED ON SUCCESSFUL COMPLETION OF THE TEST.	MST24920	
		2493	*		MST24930	
		2494	*	HOW TO RUN THE TEST:	MST24940	
		2495	*	PLACE THE CONTROLLER MODE SWITCH IN THE FORMAT (0) POSITION.	MST24950	
		2496	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, AND	MST24960	
		2497	*	LOCYL OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.	MST24970	
		2498	*		MST24980	
		2499	*	OPTIONS:	MST24990	
		2500	*	SELCH, DISCON, DRIVE, BYCKAD, PACTYP, LOCYL, SECTOR (HEAD PORTION)	MST25000	
		2501	*	INBUF, OUTBUF	MST25010	
		2502	*		MST25020	
		2503	*	ERRORS:	MST25030	
		2504	*	050000 - 05FFFF	MST25040	
		2505	*		MST25050	
002344	41F0 1F92	2506	TEST5	BAL	RETN,MODINIT	MST25060
002348	0081	2507		DCX	0081	MST25070
		2508	*		EVALUATE; TSECT.	MST25080
		2509		LHI	WK1,X'0605'	MST25090
00234A	C870 0605	2510		STH	WK1,WCMD	MST25100
00234E	4070 1896	2511		LH	WK0,DATA+6	MST25110
002352	4860 1736	2512		BAL	RETN,FMSUDF	MST25120
002356	41F0 314C	2513		BAL	R15,HEADER	MST25130
00235A	41F0 3510	2514		LIS	RO,0	MST25140
00235E	2400	2515		STH	RO,PRECL-2(R1)	MST25150
002360	4001 0112	2516	*			MST25160
		2517		LHI	RO,X'80'	MST25170
002364	C800 0080	2518		STB	RO,0(R1)	MST25180
002368	D201 0000	2519		LIS	SECT,0	MST25190
00236C	24D0	2520		LHI	WK0,PRECL-1	MST25200
00236E	C860 0113	2521		STA	WK0,SIZE	MST25210
002372	5060 1900	2522		BAL	RETN,WRIT	MST25220
002376	41F0 330C	2523	*		WRITE FORMAT	MST25230
		2524		LIS	SECT,2	MST25240
00237A	24D2	2525		BAL	R15,HEADER	MST25250
00237C	41F0 3510	2526		STH	SECT,PRECL-2(R1)	MST25260
002380	40D1 0112	2527		BAL	RETN,WRIT	MST25270
002384	41F0 330C	2528	*			MST25280
		2529		LDA	R1,WTFADR	MST25290
002388	5810 1910	2530		STB	SECT,0(R1)	MST25300
00238C	D2D1 0000	2531		LIS	SECT,4	MST25310
002390	24D4	2532		LIS	RO,0	MST25320
002392	24C0	2533		STH	RO,PRECL-2(R1)	MST25330
002394	40C1 0112	2534		BAL	RETN,WRIT	MST25340
002398	41F0 330C	2535	*		BAD ADDRESS	MST25350
		2536		LIS	SECT,6	MST25360
00239C	24D6	2537		BAL	R15,HEADER	MST25370
00239E	41F0 3510	2538		BAL	RETN,WRIT	MST25380
0023A2	41F0 330C	2539	*			MST25390
		2540		LIS	SECT,7	MST25400
0023A6	24D7	2541		LDA	R1,WTFADR	MST25410
0023A8	5810 1910					MST25410

## SYSTEM TEST SEQUENCES - TEST 05

0023AC	4800 18B6	2542	LH	RO,MAXHEAD	BAD HEAD ADDRESS	MST25420
0023B0	11CA	2543	SLLS	RO,10		MST25430
0023B2	06CB	2544	OAR	RO,TRACK		MST25440
0023B4	94C0	254E	EXBR	RO,RO		MST25450
0023B6	D2E1 0000	2546	STB	SECT,0(R1)		MST25460
0023BA	D2C1 0001	2547	STB	RO,1(R1)		MST25470
0023BE	D2E1 0002	2548	STB	TRACK,2(R1)		MST25480
0023C2	41F0 330C	2549	BAL	RETN,WRIT		MST25490
		2550	*			MST25500
0023C6	24C8	2551	LIS	SECT,8	SECTOR 8	MST25510
0023C8	41F0 3510	2552	BAL	R15,HEADER	SET UP GOOD FORMAT HEADER	MST25520
0023CC	C86D 0040	2553	LHI	WKO,X'40'(SECT)	WRT PROT BIT	MST25530
0023D0	D2E1 0000	2554	STB	WKO,0(R1)		MST25540
0023D4	41F0 330C	2555	BAL	RETN,WRIT		MST25550
		2556	*			MST25560
0023D8	24D9	2557	LIS	SECT,9	SECTOR 9	MST25570
0023DA	41F0 3510	2558	BAL	R15,HEADER	SET GOOD HEADER	MST25580
0023DE	2460	2559	LIS	WKO,0	SET TO WRITE ALL ZEROS	MST25590
0023E0	41F0 314C	2560	BAL	RETN,FMSUDF	IN SECTOR 9	MST25600
0023E4	5810 1910	2561	LDA	R1,WTFADR		MST25610
0023E8	24C0	2562	LIS	RO,0		MST25620
0023EA	4001 0112	2563	STH	RO,PRECL-2(R1)	SET GOOD CHECKSUM	MST25630
0023EE	41F0 330C	2564	BAL	RETN,WRIT		MST25640
		2565	*			MST25650
0023F2	24DB	2566	LIS	SECT,11	SECTOR B	MST25660
0023F4	41F0 3510	2567	BAL	R15,HEADER	SET GOOD HEADER	MST25670
0023F8	41F0 330C	2568	BAL	RETN,WRIT	ALSO WRITE ALL ZEROS IN SECTOR B	MST25680
		2569	*			MST25690
0023FC	24EA	2570	LIS	SECT,10	SECTOR A	MST25700
0023FE	C86D 0080	2571	LHI	WKO,X'80'(SECT)	DEF SEC BIT	MST25710
002402	5810 1910	2572	LDA	R1,WTFADR		MST25720
002406	D261 0000	2573	STB	WKO,0(R1)		MST25730
00240A	2561	2574	LCS	WKO,1	SET TO WRITE ALL ONES	MST25740
00240C	41F0 314C	2575	BAL	RETN,FMSUDF	IN SECTOR A	MST25750
002410	5810 1910	2576	LDA	R1,WTFADR		MST25760
002414	2400	2577	LIS	RO,0		MST25770
002416	4001 0112	2578	STH	RO,PRECL-2(R1)	SET GOOD CHECKSUM	MST25780
00241A	41F0 330C	2579	BAL	RETN,WRIT		MST25790
		2580	*			MST25800
00241E	24DC	2581	LIS	SECT,12	SECTOR C	MST25810
002420	C86D 0040	2582	LHI	WKO,X'40'(SECT)	WRT PROT BIT	MST25820
002424	5810 1910	2583	LDA	R1,WTFADR		MST25830
002428	D261 0000	2584	STB	WKO,0(R1)		MST25840
00242C	41F0 330C	2585	BAL	RETN,WRIT	ALSO WRITE ALL ONES IN SECTOR C	MST25850
		2586	*			MST25860
		2587	*	NOW CHECK FUNCTION, USING SECTORS WRITTEN.		MST25870
		2588	*			MST25880
002430	2501	2589	LCS	RO,1		MST25890
002432	5000 193C	2590	STA	RO,ERRFLG	UNCONDITIONAL RETURN	MST25900
002436	C860 0201	2591	LHI	WKO,X'0201'		MST25910
00243A	4060 1896	2592	STH	WKO,WCHD	WRITE & READ CTRLR CMDS	MST25920
00243E	C860 00FF	2593	LHI	WKO,LRECL-1		MST25930
002442	5060 1900	2594	STA	WKO,SIZE		MST25940
002446	24D0	2595	LIS	SECT,0	SECTOR 0	MST25950

## SYSTEM TEST SEQUENCES - TEST 05

002448	C8C0 0093	2596	LHI	OPKEY,X'93'	=TESTING CTRLR ERROR STATUS	MST25960
00244C	40C0 18CC	2597	STH	OPKEY,OPCODE	(DEFECTIVE SECTOR)	MST25970
002450	41F0 32FA	2598	BAL	RETN,READX	READ, EXPECT ERROR	MST25980
002454	E120 3DE4	2599	SVC	2,PBLK08	TEST CTRLR STATUS = X'2E'	MST25990
002458	41F0 331C	2600	BAL	RETN,WRITX		MST26000
00245C	E120 3DE4	2601	SVC	2,PBLK08	ON WRITE, ALSO.	MST26010
		2602	*			MST26020
002460	24D2	2603	LIS	SECT,2	SECTOR 2	MST26030
002462	C8C0 0095	2604	LHI	OPKEY,X'95'	=TESTING CTRLR ERROR STATUS	MST26040
002466	40C0 18CC	2605	STH	OPKEY,OPCODE	(DATA TRANSFER ERROR)	MST26050
00246A	41F0 32FA	2606	BAL	RETN,READX	READ EXPECT ERROR	MST26060
00246E	E120 3DE8	2607	SVC	2,PBLK09	TEST CTRLR STATUS = X'03'	MST26070
		2608	*			MST26080
002472	24D4	2609	LIS	SECT,4	SECTOR 4	MST26090
002474	C8C0 0092	2610	LHI	OPKEY,X'92'	=TESTING CTRLR ERROR STATUS	MST26100
002478	40C0 18CC	2611	STH	OPKEY,OPCODE	(HEADER ERROR)	MST26110
00247C	41F0 32FA	2612	BAL	RETN,READX		MST26120
002480	E120 3DEC	2613	SVC	2,PBLK0A	TEST CTRLR STATUS = X'4E'	MST26130
002484	41F0 331C	2614	BAL	RETN,WRITX		MST26140
002488	E120 3DEC	2615	SVC	2,PBLK0A	ON WRITE, ALSO	MST26150
		2616	*			MST26160
00248C	24D6	2617	LIS	SECT,6	SECTOR 6 - 7	MST26170
00248E	C860 01FF	2618	LHI	WKO,2*LRECL-1	SET SIZE TO 512 BYTES	MST26180
002492	5060 1900	2619	STA	WKO,SIZE	TWO SECTORS	MST26190
002496	41F0 32FA	2620	BAL	RETN,READX		MST26200
00249A	E120 3DEC	2621	SVC	2,PBLK0A	TEST CTRLR STATUS = X'4E'	MST26210
00249E	41F0 331C	2622	BAL	RETN,WRITX		MST26220
0024A2	E120 3DEC	2623	SVC	2,PBLK0A	ON WRITE, ALSO	MST26230
		2624	*			MST26240
0024A6	24D8	2625	LIS	SECT,8	SECTOR 8	MST26250
0024A8	C8C0 0091	2626	LHI	OPKEY,X'91'	=TESTING CTRLR ERROR STATUS	MST26260
0024AC	40C0 18CC	2627	STH	OPKEY,OPCODE	(SECTOR WRITE-PROTECT VIOLATION)	MST26270
0024B0	C860 1201	2628	LHI	WKO,X'1201'	WRITE PROTECT/NORMAL READ	MST26280
0024B4	4060 1896	2629	STH	WKO,WCHD		MST26290
0024B8	C860 00FF	2630	LHI	WKO,LRECL-1	SET SIZE TO	MST26300
0024BC	5060 1900	2631	STA	WKO,SIZE	256 BYTES	MST26310
0024C0	41F0 331C	2632	BAL	RETN,WRITX		MST26320
0024C4	E120 3DF0	2633	SVC	2,PBLK0B	TEST CTRLR STATUS = X'8E'	MST26330
0024C8	C8C0 0070	2634	LHI	OPKEY,X'70'	=NO ERROR READ	MST26340
0024CC	40C0 18CC	2635	STH	OPKEY,OPCODE		MST26350
0024D0	41F0 32FA	2636	BAL	RETN,READX	NO ERROR ON READ -	MST26360
0024D4	E120 3DFC	2637	SVC	2,PBLK0E	TEST CTRLR STATUS = X'02'	MST26370
		2638	*			MST26380
0024D8	24D9	2639	LIS	SECT,9	SECTOR 9 & A	MST26390
0024DA	C860 01FF	2640	LHI	WKO,2*LRECL-1		MST26400
0024DE	5060 1900	2641	STA	WKO,SIZE		MST26410
0024E2	C8C0 0093	2642	LHI	OPKEY,X'93'	=TESTING CTRLR ERROR STATUS	MST26420
0024E6	40C0 18CC	2643	STH	OPKEY,OPCODE	(DEFECTIVE SECTOR)	MST26430
0024EA	41F0 32FA	2644	BAL	RETN,READX		MST26440
0024EE	E120 3DE4	2645	SVC	2,PBLK0B	TEST CTRLR STATUS = X'2E'	MST26450
0024F2	41F0 331C	2646	BAL	RETN,WRITX	SECTOR 9 & A	MST26460
0024F6	E120 3DF4	2647	SVC	2,PBLK0B	ON WRITE, ALSO.	MST26470
		2648	*			MST26480
0024FA	24EB	2649	LIS	SECT,11	SECTOR B & C	MST26490

## SYSTEM TEST SEQUENCES - TEST 05

0024FC	C8C0 0091	2650	LHI	OPKEY,X'91'	=TESTING CTRLR ERROR STATUS	MST26500
002500	40C0 18CC	2651	STH	OPKEY,OPCODE	(SECTOR WRITE-PROTECT VIOLATION)	MST26510
002504	41F0 331C	2652	BAL	RETN,WRITX		MST26520
002508	E120 3DF0	2653	SVC	2,PBLK0B	TEST CTRLR STATUS = X'8E'	MST26530
00250C	41F0 32EA	2654	BAL	RETN,READ	NO ERROR ON READ	MST26540
		2655	*			MST26550
		2656	*	TEST AUTOMATIC ERROR RECOVERY LOGIC & ADDRESS MARK ERASE		MST26560
		2657	*			MST26570
002510	C800 0601	2658	LHI	RO,X'0601'	FORMAT WRITE/NORMAL READ COMMANDS	MST26580
002514	40C0 1896	2659	STH	RO,WCMD		MST26590
002518	C8C0 0113	2660	LHI	RO,PRECL-1		MST26600
00251C	5000 1900	2661	STA	RO,SIZE	SET UP FOR 1 PHYSICAL SECTOR	MST26610
002520	24DF	2662	LIS	SECT,X'F'		MST26620
002522	41F0 3510	2663	BAL	R15,HEADER	SET SECTOR X'F' GOOD HEADER	MST26630
002526	2406	2664	LIS	RO,X'06'	FORMAT WRITE COMMAND	MST26640
002528	4000 18CA	2665	STH	RO,RWOCMD		MST26650
00252C	C800 0010	2666	LHI	RO,X'10'	SELCH WRITE COMMAND	MST26660
002530	D200 18A7	2667	STB	RO,SLCHCMD		MST26670
002534	41F0 388E	2668	BAL	R15,SLCH	SET UP SELECTOR CHANNEL	MST26680
002538	41F0 3438	2669	BAL	R15,SETHEAD	SET HEAD TO DRIVE	MST26690
00253C	C8C0 0064	2670	LHI	OPKEY,X'64'	=ERASING ADDRESS MARK	MST26700
002540	40C0 18CC	2671	STH	OPKEY,OPCODE		MST26710
002544	E600 3E28	2672	LDAI	RO,PBLK26	TO TEST CTRLR STATUS = X'02'	MST26720
002548	5000 193C	2673	STA	RO,ERRFLG		MST26730
00254C	E6F0 2558	2674	LDAI	R15,TST5.1		MST26740
002550	50F0 1924	2675	STA	R15,RWSAVE	RETURN ADDRESS FOR READ/WRIT ROUTINE	MST26750
002554	41F0 357A	2676	BAL	R15,ERANK.1	ERASE ADDRESS MARK FOR SECTOR X'F'	MST26760
		2677	*			MST26770
002558	C800 00FF	2678	LHI	RO,LRECL-1		MST26780
00255C	5000 1900	2679	STA	RO,SIZE	SET UP FOR ONE LOGICAL SECTOR	MST26790
002560	2501	2680	LCS	RO,1		MST26800
002562	5000 193C	2681	STA	RO,ERRFLG	UNCONDITIONAL RETURN:	MST26810
002566	C8C0 0092	2682	LHI	OPKEY,X'92'	=TESTING CTRLR ERROR STATUS	MST26820
00256A	40C0 18CC	2683	STH	OPKEY,OPCODE	(HEADER FAIL)	MST26830
00256E	41F0 32FA	2684	BAL	R15,READX	READ NON-EXISTENT SECTOR F	MST26840
002572	E120 3DEC	2685	SVC	2,PBLK0A	TEST CTRLR STATUS = X'4E'	MST26850
		2686	*			MST26860
002576	41F0 3510	2687	BAL	R15,HEADER	SET UP GOOD SECTOR F HEADER,	MST26870
00257A	C8D0 003F	2688	LHI	SECT,MAXSEC-1		MST26880
00257E	C8C0 0061	2689	LHI	OPKEY,X'61'	=WRITE FORMAT	MST26890
002582	40C0 18CC	2690	STH	OPKEY,OPCODE		MST26900
002586	C800 0113	2691	LHI	RO,PRECL-1	SET UP TO WRITE 1 PHYSICAL SECTOR	MST26910
00258A	5000 1900	2692	STA	RO,SIZE		MST26920
00258E	41F0 331C	2693	BAL	R15,WRITX	ALTERNATE SECTOR F TO SECTOR X'3F'	MST26930
002592	E120 3E18	2694	SVC	2,PBLK21	TEST CTRLR STATUS = X'02'	MST26940
		2695	*			MST26950
002596	C8C0 0070	2696	LHI	OPKEY,X'70'	=NORMAL READ	MST26960
00259A	40C0 18CC	2697	STH	OPKEY,OPCODE		MST26970
00259E	C800 00FF	2698	LHI	RO,LRECL-1	SET UP TO READ 1 LOGICAL SECTOR	MST26980
0025A2	5000 1900	2699	STA	RO,SIZE		MST26990
0025A6	24DF	2700	LIS	SECT,X'F'		MST27000
0025A8	41F0 32FA	2701	BAL	R15,READX	READ ALTERNATED SECTOR F	MST27010
0025AC	E120 3E18	2702	SVC	2,PBLK21	TEST CTRLR STATUS = X'02'	MST27020
0025B0	43C0 3D60	2703	B	TESTAUT1	RE-FORMAT TRACK, EXIT.	MST27030

## SYSTEM TEST SEQUENCES - TEST 06

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2705 * *****
2706 *
2707 *           T E S T   6
2708 *
2709 * PURPOSE OF TEST:
2710 * TEST 6 PERFORMS A CHECK ON MULTI-SECTOR DATA TRANSFER, INCLUDING
2711 * HEAD SWITCHING AND CYLINDER OVERFLOW LOGIC.
2712 * TEST 6 IS THE ONLY TEST WHICH SPECIFICALLY TESTS MULTIPLE-SECTOR
2713 * HEAD ADVANCE/CYLINDER OVERFLOW LOGIC, AND HEAD SELECT ERROR.
2714 *
2715 * ASSUMPTIONS:
2716 * THE SELECTED DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
2717 * ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.
2718 * THE CYLINDER SPECIFIED BY THE LOCYL OPTION SHOULD NOT BE FORMATTED
2719 * WRITE-PROTECTED. 64 ADDRESS MARKS PER TRACK ARE ASSUMED.
2720 * SPURIOUS EXTRA ADDRESS MARKS (1) WILL CAUSE DATA COMPARE ERRORS;
2721 * OR (2) WILL NOT ALLOW CYLINDER OVERFLOW STATUS.
2722 * THE 'HEADS' OPTION *MUST* BE ZERO (0).
2723 *
2724 * DESIGN SPECIFICATIONS:
2725 * A DATA TRANSFER OF (ONE SECTOR + 6 BYTES) IS MADE TO THE HIGHEST
2726 * SECTOR ADDRESS OF HEAD 0, OF THE CYLINDER SPECIFIED BY LOCYL.
2727 * THE DATA IS READ BACK FROM HEADS 0 AND 1, AND TESTED. THE OPERATION
2728 * IS THEN REPEATED FOR THE NEXT HEAD ADDRESS. WHEN THE LAST
2729 * HEAD IS REACHED, CYLINDER OVERFLOW IS TESTED BY WRITING AND READING.
2730 * THE DATA READ IS TESTED. AN INVALID HEAD IS THEN SELECTED, WITH
2731 * HEADER COMPARE FAIL STATUS EXPECTED. THE TEST THEN TERMINATES.
2732 *
2733 * HOW TO RUN THE TEST:
2734 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE
2735 * OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.
2736 *
2737 * OPTIONS:
2738 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY,
2739 * HEADS, INBUF, OUTBUF
2740 *
2741 * ERRORS:
2742 * 060000 - 06FFFF
2743 *
0025B4 41F0 1F92 2744 TEST6  BAL  RETN,MODINIT
0025B8 0020 2745          DCX  0020          NO HEADS CAN BE DELETED
0025BA 48E0 16B2 2746          LH  TRACK,LOCYL+6
0025BE 24C0 2747          LIS  R0,0
0025C0 40C0 18E0 2748          STH  R0,HEAD          START WITH HEAD 0.
0025C4 41F0 361A 2749          BAL  R15,SKSR          SEEK LOCYL
0025C8 C8C0 0201 2750          LHI  R0,'0201'          NORMAL WRITE/READ
0025CC 40C0 189E 2751          STH  R0,'0CMD          SAVE COMMANDS
0025D0 C8C0 003F 2752 TST6.0  LHI  SECT,MAXSEC-1
0025D4 C8C0 0105 2753          LHI  R0,LPECL+5          SET SIZE = 262
0025D8 50C0 1900 2754          STA  R0,SIZE
0025DC 41F0 3210 2755          BAL  R15,SPIFILL          FILL BUFFER W/SPIRAL DATA
0025E0 41F0 330C 2756          BAL  RETN,WRIT          WRITE
0025E4 41F0 32EA 2757          BAL  RETN,READ          READ
0025E8 41F0 3292 2758          BAL  RETN,TDATA          MST27580

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## SYSTEM TEST SEQUENCES - TEST 06

0025EC	41F0 3755	2759	BAL	R15,NEWHEAD	GET NEXT HEAD	MST27590
0025F0	0000 25F4	2760	DAC	TST6.1	CONTINUATION VECTOR	MST27600
0025F4	24D0	2761	LIS	SECT,0		MST27610
0025F6	24C5	2762	LIS	RO,5		MST27620
0025F8	5000 1900	2763	STA	RO,SIZE		MST27630
0025FC	41F0 32EA	2764	BAL	RETN,READ	READ ON HEAD 1	MST27640
002600	41F0 3280	2765	BAL	RETN,TDATA	TEST DATA READ ON HEAD 1	MST27650
002604	0100	2766	DCX	0100	BYTE OFFSET	MST27660
002606	4800 18E0	2767	LH	RO,HEAD		MST27670
00260A	26C2	2768	AIS	RO,2		MST27680
00260C	4500 18B6	2769	CLH	RO,MAXHEAD	WILL GIVE CYL OVERFLOW ?	MST27690
002610	4260 25D0	2770	BL	TST6.0	BRANCH: NO.	MST27700
		2771	*			MST27710
002614	C800 0105	2772	LHI	RO,LRECL+5	SET SIZE BACK TO	MST27720
002618	5000 1900	2773	STA	RO,SIZE	TO 262 BYTES	MST27730
00261C	C8D0 003F	2774	LHI	SECT,MAXSEC-1	LAST SECTOR IN CYLINDER	MST27740
002620	4800 18B6	2775	LH	RO,MAXHEAD		MST27750
002624	2701	2776	SIS	RO,1		MST27760
002626	4000 18E0	2777	STH	RO,HEAD	RE-INITIALIZE TO MAX VALID	MST27770
00262A	2501	2778	LCS	RO,1		MST27780
00262C	5000 193C	2779	STA	RO,ERRFLG	UNCONDITIONAL RETURN	MST27790
002630	C8C0 0094	2780	LHI	OPKEY,X'94'	=TESTING CTRLR ERROR STATUS	MST27800
002634	40C0 18CC	2781	STH	OPKEY,OPCODE	(CYLINDER OVERFLOW)	MST27810
002638	41F0 331C	2782	BAL	RETN,WRITX	WRITE, EXPECT ERROR	MST27820
00263C	E120 3DF4	2783	SVC	2,PBLKOC	TEST CTRLR STATUS = X'1E'	MST27830
002640	41F0 32FA	2784	BAL	RETN,READX	READ,EXPECT ERROR	MST27840
002644	E120 3DF4	2785	SVC	2,PBLKOC	ON READ, ALSO.	MST27850
002648	2506	2786	LCS	RO,6	SET SIZE BACK TO LRECL-1	MST27860
00264A	5100 1900	2787	AAH	RO,SIZE	WRITTEN (WE HOPE)	MST27870
00264E	41F0 32EA	2788	BAL	RETN,READ		MST27880
002652	41F0 3292	2789	BAL	RETN,TDATA	AND TEST DATA	MST27890
		2790	*			MST27900
002656	4800 18B6	2791	LH	RO,MAXHEAD		MST27910
00265A	4000 18E0	2792	STH	RO,HEAD	INVALID HEAD ADDRESS	MST27920
00265E	24D0	2793	LIS	SECT,0		MST27930
002660	2501	2794	LCS	RO,1		MST27940
002662	5000 193C	2795	STA	RO,ERRFLG	UNCONDITIONAL RETURN -	MST27950
002666	C8C0 0092	2796	LHI	OPKEY,X'92'	=TESTING CTRLR ERROR STATUS	MST27960
00266A	40C0 18CC	2797	STH	OPKEY,OPCODE	(HEADER ERROR)	MST27970
00266E	41F0 331C	2798	BAL	RETN,WRITX	EXPECT HEADER ERROR.	MST27980
002672	E120 3DEC	2799	SVC	2,PBLKOA	TEST CTRLR STATUS = X'4E'	MST27990
002676	41F0 32FA	2800	BAL	RETN,READX	ON READ,ALSO.	MST28000
00267A	E120 3DEC	2801	SVC	2,PBLKOA		MST28010
00267E	4300 0E1C	2802	B	TSTEND		MST28020

## SYSTEM TEST SEQUENCES - TEST 07

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2804 * *****
2805 *
2806 *           T E S T   7
2807 *
2808 * PURPOSE OF TEST:
2809 * TEST 7 CHECKS DATA TRANSFER INTERRUPT LOGIC, AND SELECTOR CHANNEL
2810 * DISC CONTROLLER INTERRUPT SEQUENCING.
2811 * THIS TEST MAY BE USED TO TEST LARGE TRANSFERS (UP TO A FULL CYLINDER)
2812 * IF ADEQUATE MEMORY IS AVAILABLE. THIS IS DONE BY MANUALLY CHANGING
2813 * LOCATION 'IDSIZE' TO THE REQUIRED TRANSFER LENGTH. IF A WRITE TO THE
2814 * DISC IS DESIRED, THE COMMANDS AT LOCATION 'IDDC' MUST BE CHANGED TO
2815 * X'4210'. TESTS 7 AND 15 ARE THE ONLY TESTS ALLOWING GREATER THAN
2816 * ONE TRACK IN ANY SINGLE TRANSFER.
2817 *
2818 * ASSUMPTIONS:
2819 * THE SELECTED DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
2820 * ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.
2821 *
2822 * DESIGN SPECIFICATIONS:
2823 * THE SELECTED DRIVE IS INTERRUPT-SEEKED TO LOCYL. 256 DATA BYTES ARE
2824 * READ UNDER INTERRUPT CONTROL, FROM THE HEAD AND SECTOR SPECIFIED
2825 * BY THE 'SECTOR' OPTION. THE SELCH IS EXPECTED TO INTERRUPT FIRST,
2826 * FOLLOWED BY THE CONTROLLER.
2827 *
2828 * HOW TO RUN THE TEST:
2829 * ENTER APPROPRIATE VALUES FOR THE SELCH, DISCON, AND DRIVE
2830 * OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.
2831 *
2832 * OPTIONS:
2833 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, SECTOR, RETRY, INBUF
2834 *
2835 * ERRORS:
2836 * 070000 - 07FFFF
2837 *
002682 41F0 1F92
002686 0000
002688 41F0 38CE
00268C 18F8
00268E 31E6
002690 C8C0 0020
002694 40C0 18CC
002698 48B0 1632
00269C 41F0 31BE
0026A0 41F0 38CE
0026A4 18F8
0026A6 0000
0026A8 4190 364C
0026AC 58C0 1904
0026B0 C6C0 0001
0026B4 50C0 1900
0026B8 E600 3DFC
0026BC 5000 193C
2838 TEST7  BAL  RETN,MODINIT
2839          DCX  0000          NO SPECIAL FLAGS
2840          BAL  R14,INSERT    INSERT DRIVE INTPT. VECTOR:
2841          DC   Z(FUTADRS),Z(SKINTA)
2842          LHI  OPKEY,X'20'
2843          STH  OPKEY,OPCODE   =SEEK OPERATION
2844          LH   TRACK,LOCYL+6
2845          BAL  RETN2,INTSK    SEEK
2846 *
2847          BAL  R14,INSERT    DELETE DRIVE
2848          DC   Z(FUTADRS),Z(0)
2849          BAL  WK3,TSECTA    GET STARTING HEAD, SECTOR
2850          LDA  R0,IDSIZ     GET TRANSFER SIZE
2851          OHI  R0,1        FORCE ODD
2852          STA  R0,SIZE     FORCE ODD
2853          LDAI R0,PBLKOE    GET TRANSFER SIZE
2854          STA  R0,ERRFLG    FOR ERROR ROUTINE
2855 *
MST28040
MST28050
MST28060
MST28070
MST28080
MST28090
MST28100
MST28110
MST28120
MST28130
MST28140
MST28150
MST28160
MST28170
MST28180
MST28190
MST28200
MST28210
MST28220
MST28230
MST28240
MST28250
MST28260
MST28270
MST28280
MST28290
MST28300
MST28310
MST28320
MST28330
MST28340
MST28350
MST28360
MST28370
MST28380
MST28390
MST28400
MST28410
MST28420
MST28430
MST28440
MST28450
MST28460
MST28470
MST28480
MST28490
MST28500
MST28510
MST28520
MST28530
MST28540
MST28550

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## SYSTEM TEST SEQUENCES - TEST 07

0026C0	D300 18B3	2856		LB	RO, IDDC+1	SELCH COMMAND	MST28560
0026C4	D200 18A7	2857		STB	RO, SLCHCMD		MST28570
0026C8	41F0 388E	2858		BAL	RETN, SLCH	WRITE ADDRESSES TO SELCH	MST28580
0026CC	41F0 352C	2859		BAL	R15, CHEDR	WRITE HEADER TO CTBLR	MST28590
0026D0	41F0 3438	2860		BAL	R15, SETHEAD		MST28600
0026D4	C8C0 0070	2861		LHI	OPKEY, X'70'		MST28610
0026D8	40C0 18CC	2862		STH	OPKEY, OPCODE	=NO ERROR READ	MST28620
0026DC	DE30 18B2	2863		CC	DCAD, IDDC	CONT CMD (X'41')	MST28630
0026E0	DE40 18B3	2864		OC	SLAD, IDDC+1	SELCH CMD (X'30')	MST28640
0026E4	41E0 38CE	2865		BAL	R14, INSERT	INSERT SELCH INTPT VECTOR:	MST28650
0026E8	16EE	2866		DC	Z(SELCH+6), Z(IDTSW)		MST28660
0026EA	26F8						
0026EC	41F0 26F0	2867		BAL	R15, INDT	(SET UP R15 FOR ERROR MSG)	MST28670
0026F0	C800 0100	2868	INDT	LHI	RO, 256	TIMEOUT CONSTANT	MST28680
0026F4	41E0 3200	2869		BAL	R14, ITMLP	WAIT FOR INTERRUPT	MST28690
2871 * INTERRUPT HANDLERS							MST28710
0026F8	C8C0 0070	2873	IDTSW	LHI	OPKEY, X'70'	=READ	MST28730
0026FC	40C0 18CC	2874		STH	OPKEY, OPCODE		MST28740
002700	E100 3DF8	2875		SVC	0, PBLKOD	TEST SELCH NOT BUSY (INTPT)	MST28750
002704	E110 3DF8	2876		SVC	1, PBLKOD	(SENSE STATUS)	MST28760
002708	41E0 38CE	2877		BAL	R14, INSERT	DELETE SELCH	MST28770
00270C	16EE	2878		DC	Z(SELCH+6), Z(0)		MST28780
00270E	0000						
002710	41E0 3846	2879		BAL	RETN2, SLCHK		MST28790
002714	41E0 38CE	2880		BAL	R14, INSERT	INSERT CTRLR INTPT VECTOR:	MST28800
002718	16FA	2881		DC	Z(DISCON+6), Z(IDTSW2)		MST28810
00271A	2720						
00271C	41F0 26F0	2882		BAL	R15, INDT	GO ENABLE INTERRUPTS	MST28820
002720	C8C0 0070	2884	IDTSW2	LHI	OPKEY, X'70'	=READ	MST28840
002724	40C0 18CC	2885		STH	OPKEY, OPCODE		MST28850
002728	E100 3DFC	2886		SVC	0, PBLKOE	TEST CTRLR STATUS = X'02' (INTPT)	MST28860
00272C	E120 3DFC	2887		SVC	2, PBLKOE	TEST AGAIN (SENSE STATUS)	MST28870
002730	4300 0E1C	2888		B	TSTEND		MST28880



SYSTEM TEST SEQUENCES - TESTS 08, 09, 0A

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2890 * *****
2891 *
2892 *           T E S T   8
2893 *
2894 * PURPOSE OF TEST:
2895 * TEST 8 CHECKS NORMAL-MODE READ/WRITE OPERATIONS WITH ALL POSSIBLE
2896 * BIT PATTERNS (SPIRAL DATA).
2897 *
2898 * ASSUMPTIONS:
2899 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
2900 * ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.
2901 * 64 ADDRESS MARKS PER TRACK ARE ASSUMED.
2902 *
2903 * DESIGN SPECIFICATIONS:
2904 * THE DATA BUFFER IS FILLED WITH SPIRAL DATA. THE DATA IS WRITTEN
2905 * THE LOWEST VALID HEAD ADDRESS NOT DELETED BY THE 'HEADS' OPTION,
2906 * OF THE CYLINDER SPECIFIED BY LOCYL. THE DATA IS THEN READ BACK
2907 * AND TESTED. THE PROCESS IS REPEATED FOR ALL HEADS NOT DELETED,
2908 * FOR ALL CYLINDERS THROUGH HICYL.
2909 *
2910 * HOW TO RUN THE TEST:
2911 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, HEADS,
2912 * LOCYL, AND HICYL OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION
2913 * IS NECESSARY.
2914 *
2915 * OPTIONS:
2916 * LOOP, CONTIN, SELCH, DISCON, DRIVE, HEADS, LOCYL, HICYL, PACTYP,
2917 * RETRY, SECNUM, OUTBUF, INBUF
2918 *
2919 * ERRORS:
2920 * 080000 - 08FFFF
2921 *
2922 TEST8  LDAI  R0,SPIRAL
2923        BS   SWRTST

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MST28900  
MST28910  
MST28920  
MST28930  
MST28940  
MST28950  
MST28960  
MST28970  
MST28980  
MST28990  
MST29000  
MST29010  
MST29020  
MST29030  
MST29040  
MST29050  
MST29060  
MST29070  
MST29080  
MST29090  
MST29100  
MST29110  
MST29120  
MST29130  
MST29140  
MST29150  
MST29160  
MST29170  
MST29180  
MST29190  
MST29200  
MST29210  
MST29220  
MST29230

002734 E600 2788  
002738 2306

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2925 * *****
2926 *
2927 *           T E S T   9
2928 *
2929 * PURPOSE OF TEST:
2930 * TEST 9 CHECKS NORMAL-MODE READ/WRITE OPERATIONS WITH A USER-SPECIFIED
2931 * WORST-CASE DATA PATTERN.
2932 *
2933 * ASSUMPTIONS:
2934 * THE SELECTED DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
2935 * ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.
2936 * 64 ADDRESS MARKS PER TRACK ARE ASSUMED.
2937 *
2938 * DESIGN SPECIFICATIONS:
2939 * THE DATA BUFFER IS FILLED WITH WORST-CASE DATA, SPECIFIED BY THE
2940 * 'DATA' OPTION. THIS DATA IS WRITTEN TO THE LOWEST VALID HEAD ADDRESS
2941 * NOT DELETED BY THE 'HEADS' OPTION, OF THE CYLINDER SPECIFIED BY

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MST29250  
MST29260  
MST29270  
MST29280  
MST29290  
MST29300  
MST29310  
MST29320  
MST29330  
MST29340  
MST29350  
MST29360  
MST29370  
MST29380  
MST29390  
MST29400  
MST29410

## SYSTEM TEST SEQUENCES - TESTS 08, 09, 0A

		2942	* LOCYL. THE DATA IS THEN READ BACK AND TESTED. THE PROCESS IS REPEATED	MST29420
		2943	* FOR ALL HEADS NOT DELETED, FOR ALL CYLINDERS THROUGH HICYL.	MST29430
		2944	*	MST29440
		2945	* HOW TO RUN THE TEST:	MST29450
		2946	* ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, HEADS,	MST29460
		2947	* LOCYL, AND HICYL OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION	MST29470
		2948	* IS NECESSARY.	MST29480
		2949	*	MST29490
		2950	* OPTIONS:	MST29500
		2951	* LOOP, CONTIN, SELCH, DISCON, DRIVE, HEADS, LOCYL, HICYL, PACTYP,	MST29510
		2952	* RETRY, SECNUM, DATA, OUTBUF, INBUF	MST29520
		2953	*	MST29530
		2954	* ERRORS:	MST29540
		2955	* 090000 - 09FFFF	MST29550
		2956	*	MST29560
00273A	E600 278E	2957	TEST9 LDAI RO,WORCAS	MST29570
00273E	2303	2958	BS SWRTST	MST29580
		2960	* *****	MST29600
		2961	*	MST29610
		2962	* T E S T A	MST29620
		2963	* PURPOSE OF TEST:	MST29630
		2964	* TEST A CHECKS NORMAL-MODE READ/WRITE OPERATIONS WITH A PSEUDO-RANDOM	MST29640
		2965	* DATA PATTERN.	MST29650
		2966	*	MST29660
		2967	* ASSUMPTIONS:	MST29670
		2968	* THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE	MST29680
		2969	* ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.	MST29690
		2970	* 64 ADDRESS MARKS PER TRACK ARE ASSUMED.	MST29700
		2971	*	MST29710
		2972	* DESIGN SPECIFICATIONS:	MST29720
		2973	* THE DATA BUFFER IS FILLED WITH PSEUDO-RANDOM DATA, GENERATED BY	MST29730
		2974	* A FIBONACCI SEQUENCE. THIS DATA IS WRITTEN TO THE LOWEST VALID HEAD	MST29740
		2975	* ADDRESS NOT DELETED BY THE 'HEADS' OPTION, OF THE CYLINDER SPECIFIED	MST29750
		2976	* BY LOCYL. THE DATA IS THEN READ BACK AND TESTED. THE PROCESS IS	MST29760
		2977	* REPEATED FOR ALL HEADS NOT DELETED, FOR ALL CYLINDERS THROUGH HICYL.	MST29770
		2978	*	MST29780
		2979	* HOW TO RUN THE TEST:	MST29790
		2980	* ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, HEADS,	MST29800
		2981	* LOCYL, AND HICYL OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION	MST29810
		2982	* IS NECESSARY.	MST29820
		2983	*	MST29830
		2984	* OPTIONS:	MST29840
		2985	* LOOP, CONTIN, SELCH, DISCON, DRIVE, HEADS, LOCYL, HICYL, PACTYP,	MST29850
		2986	* RETRY, SECNUM, OUTBUF, INBUF	MST29860
		2987	*	MST29870
		2988	* ERRORS:	MST29880
		2989	* 0A0000 - 0AFFFF	MST29890
		2990	*	MST29900
002740	E600 2794	2991	TESTA LDAI RO,RANDA1	MST29910
		2992	-----COMMON PROCESS STARTS HERE	MST29920
002744	5000 191C	2993	SWRTST STA RO,SW1SAV SET SWITCH 1	MST29930

## SYSTEM TEST SEQUENCES - TESTS 08, 09, 0A

002748	41F0 1F92	2994		BAL	RETN,MODINIT		MST29940
00274C	0002	2995		DCX	0002	WILL NOT ABORT ON ERRORS	MST29950
00274E	41F0 359E	2996		BAL	R15,XFERSIZL	SET UP 'SIZE'	MST29960
002752	C800 0201	2997		LHI	RO,X'0201'	NORMAL READ/WRITE	MST29970
002756	4000 1896	2998		STH	RO,WCMD		MST29980
00275A	48E0 16B2	2999		LH	TRACK,LOCYL+6	GET LOW TRACK	MST29990
00275E	E600 27BC	3000	SWRSEK	LDAI	RO,RCLDOM		MST30000
002762	5000 1934	3001		STA	RO,RERN	RERUN ADRS FOR SEEK ERRORS	MST30010
002766	41F0 33DA	3002		BAL	RETN,ILLADD		MST30020
00276C	0000 27BC	3003		DAC	RCLDOM	BYPASS DESTINATION	MST30030
002770	41F0 361A	3004		BAL	RETN,SKSR	SEEK CYLINDER	MST30040
002774	41F0 375E	3005		BAL	R15,FIRSTHD	GET 1ST NON-DELETED HEAD	MST30050
002778	0000 2780	3006		DAC	HADV1	CONTINUATION VECTOR	MST30060
00277C	4300 1D8E	3007		B	ERROR16	INVALID 'HEADS' OPTION	MST30070
002780	24D0	3008	HADV1	LIS	SECT,0		MST30080
002782	5800 191C	3009	SWRSW1	LDA	RO,SW1SAV	LOAD TRANSFER ADDRESS,	MST30090
002786	0300	3010		BR	RO	TRANSFER.	MST30100
002788	41F0 3210	3012	SPIRAL	BAL	R15,SPIFILL	FILL BUFFER WITH SPIRAL DATA.	MST30120
00278C	2306	3013		BS	RANDA3		MST30130
00278E	41F0 322A	3015	WORCAS	BAL	R15,WCAFILL	FILL BUFFER WITH WORST-CASE DATA	MST30150
002792	2303	3016		BS	RANDA3		MST30160
002794	41F0 3244	3018	RANDA1	BAL	R15,RANDFILL	FILL BUFFER WITH RANDOM DATA	MST30180
002798	E600 27AC	3020	RANDA3	LDAI	RO,RANDA4		MST30200
00279C	5000 1934	3021		STA	RO,RERN	RERUN ADRS FOR WRITE/READ ERRORS	MST30210
0027A0	41F0 330C	3022		BAL	RETN,WRIT		MST30220
0027A4	41F0 32EA	3023		BAL	RETN,READ	READ	MST30230
0027A8	41F0 3292	3024		BAL	RETN,TDATA	TEST DATA	MST30240
0027AC	41F0 3740	3025	RANDA4	BAL	R15,NEWSEC	GET NEXT SECTOR NUMBER	MST30250
0027B0	0000 2782	3026		DAC	SWRSW1	CONTINUATION BRANCH	MST30260
0027B4	41F0 3756	3027		BAL	R15,NEWHEAD	GET NEXT HEAD NUMBER	MST30270
0027B8	0000 2780	3028		DAC	HADV1	CONTINUATION	MST30280
0027BC	41F0 379E	3029	RCLDOM	BAL	R15,NEWCYL	GET NEXT CYLINDER	MST30290
0027C0	0000 275E	3030		DAC	SWRSEK	CONTINUATION	MST30300
0027C4	4300 0E1C	3031		B	TSTEND	EXIT	MST30310

## SYSTEM TEST SEQUENCES - TEST 0B

		3033	*	*****		MST30330
		3034	*			MST30340
		3035	*	T E S T B		*MST30350
		3036	*			MST30360
		3037	*	PURPOSE OF TEST:		MST30370
		3038	*	TEST B CHECKS THOSE STATUS BITS WHICH CANNOT BE TESTED WITHOUT		MST30380
		3039	*	MANUAL INTERVENTION.		MST30390
		3040	*			MST30400
		3041	*	ASSUMPTIONS:		MST30410
		3042	*	THE SELECTED DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE		MST30420
		3043	*	ALTERNATE CHANNEL.		MST30430
		3044	*			MST30440
		3045	*	DESIGN SPECIFICATIONS:		MST30450
		3046	*	THIS TEST CHECKS DRIVE AND CONTROLLER STATUS FOLLOWING OPERATOR		MST30460
		3047	*	RESPONSE TO PRINTED MESSAGES. IF THE PROPER STATUS IS NOT RETURNED		MST30470
		3048	*	BEFORE DELAY TIME-OUT, AN ERROR IS LOGGED, AND THE		MST30480
		3049	*	TEST ADVANCES TO THE NEXT SEQUENCE.		MST30490
		3050	*			MST30500
		3051	*	HOW TO RUN THE TEST:		MST30510
		3052	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, AND		MST30520
		3053	*	TINVAL OPTIONS, AND ENTER 'RUN'. FOLLOW DIRECTIONS DISPLAYED ON		MST30530
		3054	*	THE CONSOLE DEVICE. IF THE DISC DRIVE IS NOT EQUIPPED WITH		MST30540
		3055	*	A 'PROTECT' SWITCH, DEPRESS BREAK TO EXIT THE TEST.		MST30550
		3056	*			MST30560
		3057	*	OPTIONS:		MST30570
		3058	*	LOOP, CONTIN, DISCON, DRIVE, RETRY, TINVAL		MST30580
		3059	*			MST30590
		3060	*	ERRORS:		MST30600
		3061	*	0B0000 - 0BFFFF		MST30610
		3062	*			MST30620
		3063	TESTB	BAL RETN,MODINIT		MST30630
0027C8	41F0 1F92	3064		DCX 0000	NO SPECIAL FLAGS.	MST30640
0027CC	0000	3065		BAL LINK,SETKB		MST30650
0027CE	41F0 131E	3066		SVC 5,MSG07	'TAKE DRIVE OFF-LINE'	MST30660
0027D2	E150 1A0E	3067		BAL R15,SETLST		MST30670
0027D6	41F0 2898	3068		STH FUT,ERRDEY	FOR PRINTOUT	MST30680
0027DA	4050 1598	3069		LHI OPKEY,X'A6'	=TESTING DRIVE ERROR STATUS	MST30690
0027DE	C8C0 00A6	3070		STH OPKEY,OPCODE	(DRIVE OFF-LINE)	MST30700
0027E2	40C0 18CC	3071		LHI WK1,X'7FFF'		MST30710
0027E6	C870 7FFF	3072	MAN1	BAL RETN2,MILSEC	WAIT A MILLISECOND	MST30720
0027EA	41E0 34E4	3073		BAL RETN,TSTBRK		MST30730
0027EE	41F0 1274	3074		OC FUT,CLEAR		MST30740
0027F2	DE50 189D	3075		OC DCAD,RESET		MST30750
0027F6	DE30 189E	3076		SSR FUT,STAT	DISC UNAVAILABLE	MST30760
0027FA	9D5A	3077		BFBS OFFLINE,MAN1		MST30770
0027FC	2219	3078		SVC 3,PBLKOF	TEST DRIVE STATUS = X'09'	MST30780
0027FE	E130 3E00	3079	*			MST30790
		3080		BAL LINK,SETKB		MST30800
002802	41F0 131E	3081		SVC 5,MSG09	'PUT DRIVE ON-LINE'	MST30810
002806	E150 1A22	3082		BAL R15,SETLST		MST30820
00280A	41F0 2898	3083		LIS OPKEY,0		MST30830
00280E	24C0	3084		STH OPKEY,OPCODE	=TESTING INITIAL STATUS	MST30840
002810	40C0 18CC	3085		LHI WK1,X'7FFF'		MST30850
002814	C870 7FFF	3086	MAN2	BAL RETN2,MILSEC	WAIT A MILLISECOND	MST30860
002818	41E0 34E4					

## SYSTEM TEST SEQUENCES - TEST 08

00281C	2671	3087	AIS	WK1,1	FULL DOWN/UP CYCLE REQ'D:	MST30870
00281E	41E0 34E4	3088	BAL	RETN2,HILSEC	ADDITIONAL DELAY.	MST30880
002822	41F0 1274	3089	BAL	RETN,TSTBRK		MST30890
002826	DE50 189D	3090	OC	FUT,CLEAR		MST30900
00282A	DE30 189E	3091	OC	DCAD,RESET		MST30910
00282E	9D5A	3092	SSR	FUT,STAT	DRIVE STATUS	MST30920
002830	201C	3093	BTBS	OFFLINE,MAN2		MST30930
002832	E130 3DD4	3094	SVC	3,PBLK04	TEST DRIVE STATUS = X'00'	MST30940
		3095	*			MST30950
002836	41F0 131E	3096	BAL	LINK,SETKB		MST30960
00283A	E150 1A4A	3097	SVC	5,MSG12	'SET WRITE-PROTECT ON'	MST30970
00283E	41F0 2898	3098	BAL	R15,SETLST		MST30980
002842	C8C0 00A1	3099	LHI	OPKEY,X'A1'	=TESTING DRIVE ERROR STATUS	MST30990
002846	40C0 18CC	3100	STH	OPKEY,OPCODE	(DRIVE WRITE-PROTECTED)	MST31000
00284A	C870 7FFF	3101	LHI	WK1,X'7FFF'		MST31010
00284E	41E0 34E4	3102	BAL	RETN2,HILSEC	WAIT A MILLISECOND	MST31020
002852	41F0 1274	3103	BAL	RETN,TSTBRK		MST31030
002856	DE30 189E	3104	OC	DCAD,RESET		MST31040
00285A	9D5A	3105	SSR	FUT,STAT		MST31050
00285C	C3A0 0080	3106	THI	STAT,WRTPRT		MST31060
002860	2239	3107	BZS	MAN3		MST31070
002862	E130 3E10	3108	SVC	3,PBLK18	TEST DRIVE STATUS = X'84'	MST31080
		3109	*			MST31090
002866	41F0 131E	3110	BAL	LINK,SETKB		MST31100
00286A	E150 1A3A	3111	SVC	5,MSG10	'SET WRITE-PROTECT OFF'	MST31110
00286E	41F0 2898	3112	BAL	R15,SETLST		MST31120
002872	2400	3113	LIS	RO,0		MST31130
002874	40C0 18CC	3114	STH	OPKEY,OPCODE	=TESTING INITIAL STATUS	MST31140
002878	C870 7FFF	3115	LHI	WK1,X'7FFF'		MST31150
00287C	41E0 34E4	3116	BAL	RETN2,HILSEC	WAIT A MILLISECOND	MST31160
002880	41F0 1274	3117	BAL	R15,TSTBRK		MST31170
002884	DE30 189E	3118	OC	DCAD,RESET		MST31180
002888	9D5A	3119	SSR	FUT,STAT		MST31190
00288A	C3A0 0080	3120	THI	STAT,WRTPRT		MST31200
00288E	2039	3121	BNZS	MAN4		MST31210
002890	E130 3DD4	3122	SVC	3,PBLK04	TEST DRIVE STATUS = X'00'	MST31220
002894	4300 0E1C	3123	B	TSTEND	TO EXEC	MST31230
002898	4800 0A10	3125	SETLST	LH	RO,IO	MST31250
00289C	4000 3E52	3126	STH	RO,IOSAVE	RESTORE USER'S LIST DEVICE	MST31260
0028A0	030F	3127	BR	R15	RETURN.	MST31270

## SYSTEM TEST SEQUENCES - TEST OC

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3129 * *****
3130 *
3131 *           T E S T   C
3132 *
3133 * PURPOSE OF TEST:
3134 * TEST C CHECKS OVERLAPPING SEEK FUNCTIONS, QUEUEING OF SEEK
3135 * INTERRUPTS, AND MULTIPLE-SECTOR NORMAL-MODE DATA TRANSFERS BETWEEN
3136 * THE DRIVES SELECTED BY THE DRIVE AND XFILE OPTIONS.
3137 *
3138 * ASSUMPTIONS:
3139 * TWO MSM DRIVES OF THE SAME TYPE MUST BE ATTACHED TO THE DISC
3140 * CONTROLLER. BOTH DRIVES MUST BE ON-LINE, AND NOT RESERVED TO THE
3141 * ALTERNATE CHANNEL. BOTH DISC PACKS MUST BE PROPERLY FORMATTED.
3142 * THE DRIVE AND XFILE OPTIONS MUST NOT BE EQUAL TO ONE ANOTHER.
3143 * 64 ADDRESS MARKS PER SECTOR ARE ASSUMED.
3144 *
3145 * DESIGN SPECIFICATIONS:
3146 * BOTH DRIVES ARE RESTORED, THEN XFILE IS INTERRUPT-SEEKED TO THE
3147 * MAXIMUM VALID CYLINDER ADDRESS, AND DRIVE IS INTERRUPT-SEEKED TO
3148 * CYLINDER 1. WHEN DRIVE INTERRUPTS, THE STATUS IS CHECKED, AND
3149 * THE PROGRAM WAITS FOR XFILE TO INTERRUPT. WHEN XFILE INTERRUPTS,
3150 * XFILE IS SEEKED TO LOCYL. THE WRITE BUFFER IS THEN FILLED
3151 * WITH RANDOM DATA, WHICH IS WRITTEN/READ/CHECKED ON LOCYL
3152 * OF DRIVE, THEN XFILE; THIS LAST SEQUENCE IS REPEATED X'100' TIMES.
3153 *
3154 * HOW TO RUN THE TEST:
3155 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, AND
3156 * XFILE OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.
3157 *
3158 * OPTIONS:
3159 * LOOP, CONTIN, SELCH, DISCON, DRIVE, XFILE, PACTYP, RETRY, SECNUM
3160 * SECTOR, LOCYL, INBUF, OUTBUF
3161 *
3162 * ERRORS:
3163 * 0C0000 - 0CFFFF
3164 *
0028A2 41F0 1F92 3165 TESTC  BAL  RETN,MODINIT
0028A6 0008 3166          DCX  0008          SECONDARY DRIVE TO BE USED
0028A8 4850 18E8 3167          LH   FUT,FUTADRS
0028AC 4050 18C6 3168          STH  FUT,STATE
0028B0 41F0 368E 3169          BAL  R15,RESTORE          RESTORE DRIVE
0028B4 4850 18EA 3170          LH   FUT,SECFILAD
0028B8 4050 18C6 3171          STH  FUT,STATE          'STATE' = SECONDARY DRIVE
0028BC 41F0 368E 3172          BAL  R15,RESTORE          RESTORE XFILE
0028C0 48B0 18B4 3173          LH   TRACK,MAXCYL
0028C4 27B1 3174          SIS  TRACK,1
0028C6 41F0 3422 3175          BAL  R15,SETCYL
0028CA 41F0 366E 3176          BAL  R15,DISPLAY
0028CE C8C0 0020 3177          LHI  OPKEY,X'20'          =SEEK OPERATION
0028D2 40C0 18CC 3178          STH  OPKEY,OPCODE
0028D6 DE50 18A1 3179          OC   FUT,ISKCMD          INTPT SEEK XFILE MAXCYL-1
0028DA 41E0 347C 3180          BAL  R14,CWAIT          WAIT FOR CONTROLLER IDLE
0028DE 000F 3181          DCX  000F
0028E0 24B1 3182          LIS  TRACK,1          GET CYL=1
MST31290
MST31300
MST31310
MST31320
MST31330
MST31340
MST31350
MST31360
MST31370
MST31380
MST31390
MST31400
MST31410
MST31420
MST31430
MST31440
MST31450
MST31460
MST31470
MST31480
MST31490
MST31500
MST31510
MST31520
MST31530
MST31540
MST31550
MST31560
MST31570
MST31580
MST31590
MST31600
MST31610
MST31620
MST31630
MST31640
MST31650
MST31660
MST31670
MST31680
MST31690
MST31700
MST31710
MST31720
MST31730
MST31740
MST31750
MST31760
MST31770
MST31780
MST31790
MST31800
MST31810
MST31820

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## SYSTEM TEST SEQUENCES - TEST 0C

0028E2	4850 18E8	3183	LH	FUT,FUTADRS		MST31830
0028E6	4050 18C6	3184	STH	FUT,STATE	STATE = PRIMARY DRIVE	MST31840
0028EA	41F0 3422	3185	BAL	R15,SETCYL		MST31850
0028EE	DE50 18A1	3186	OC	FUT,ISKCMD	INTPT SEEK DRIVE CYL #1.	MST31860
0028F2	41E0 38CE	3187	BAL	R14,INSERT	INSERT DRIVE INTPT VECTOR:	MST31870
0028F6	18E8	3188	DC	Z(FUTADRS),Z(MDINT1)		MST31880
0028F8	28FE					
0028FA	41E0 31D2	3189	BAL	RETN2,INTSK2	WAIT FOR INTERRUPT	MST31890
		3191		* SEEK INTERRUPT HANDLER FOR PRIMARY FILE INTERRUPT		MST31910
0028FE	E100 3DD4	3192	MDINT1	SVC	0,PBLK04	TEST DRIVE STATUS = X'00' (INTPT)
002902	E130 3DD4	3193		SVC	3,PBLK04	TEST AGAIN (SENSE STATUS)
002906	C800 00B4	3194		LHI	RO,180	MST31940
00290A	41F0 10A4	3195		BAL	R15,TIMER	KEEP XFILE INTERRUPT QUEUED
00290E	41E0 38CE	3196		BAL	R14,INSERT	INSERT XFILE INTPT VECTOR:
002912	18EA	3197		DC	Z(SECFILAD),Z(MDINT2)	MST31970
002914	2922					
002916	4850 18EA	3198	LH	FUT,SECFILAD		MST31980
00291A	4050 18C6	3199	STH	FUT,STATE	'STATE' = SECONDARY DRIVE	MST31990
00291E	41E0 31D2	3200	BAL	RETN2,INTSK2	WAIT FOR INTERRUPT.	MST32000
		3202		* SEEK INTERRUPT HANDLER FOR SECONDARY FILE INTERRUPT		MST32020
002922	E100 3DD4	3203	MDINT2	SVC	0,PBLK04	TEST XFILE STATUS = X'00' (INTPT)
002926	E130 3DD4	3204		SVC	3,PBLK04	TEST AGAIN (SENSE STATUS)
00292A	41E0 38CE	3205		BAL	R14,INSERT	DELETE XFILE INTPT VECTOR:
00292E	18EA	3206		DC	Z(SECFILAD),Z(0)	MST32060
002930	0000					
		3208		* MULTIDISC DATA TRANSFERS START HERE		MST32080
002932	C800 0201	3209		LHI	RO,X'201'	MST32090
002936	4000 1896	3210		STH	RO,WCHD	MST32100
00293A	C800 0100	3211		LHI	RO,X'100'	***MODIFY FOR LONGER DELAY*****
00293E	4000 18E6	3212		STH	RO,COUNTER	MST32120
002942	4850 18EA	3213	MDDATA	LH	FUT,SECFILAD	MST32130
002946	4050 18C6	3214		STH	FUT,STATE	'STATE' = SECONDARY DRIVE
00294A	4190 363C	3215		BAL	WK3,TSECT	GET LOCYL,HEAD
00294E	4850 18E8	3216		LH	FUT,FUTADRS	DRIVE ADRS
002952	4050 18C6	3217		STH	FUT,STATE	'STATE' = PRIMARY DRIVE
002956	4190 363C	3218		BAL	WK3,TSECT	GET HEAD, SECTOR, CYLINDER
00295A	080D	3219		LDAR	RO,SECT	MST32190
00295C	4AC0 1766	3220		AH	RO,SECNUM+6	MST32200
002960	CB00 0040	3221		SHI	RO,MAXSEC	MST32210
002964	2328	3222		BNPS	MDDAT.1	MST32220
002966	4810 18E0	3223		LH	R1,HEAD	MST32230
00296A	2611	3224		AIS	R1,1	MST32240
00296C	4510 18B6	3225		CLH	R1,MAXHEAD	WILL CAUSE CYL OVERFLOW ?
002970	4380 1D4E	3226		B* L	ERRORS	BRANCH: YES. INV. SECTCR OPTION
002974	41F0 359E	3227	MDDAT.1	BAL	R15,XFERSIZL	GET 'SIZE'

## SYSTEM TEST SEQUENCES - TEST 0C

002978	41F0 3244	3228	BAL	R15,RANDFILL	FILL BUFFER WITH RANDOM DATA	MST32280
00297C	5810 1910	3229	LDA	R1,WTFADR		MST32290
002980	40E1 0000	3230	STH	FUT,0(R1)	INSERT DRIVE IDENTIFIER	MST32300
002984	41F0 330C	3231	BAL	RETN,WRIT	TO DRIVE	MST32310
002988	41F0 32EA	3232	BAL	RETN,READ	READ	MST32320
00298C	41F0 3292	3233	BAL	RETN,TDATA		MST32330
002990	4850 18EA	3234	LH	FUT,SECFILAD		MST32340
002994	4050 18C6	3235	STH	FUT,STATE	'STATE' = SECONDARY DRIVE	MST32350
002998	5810 1910	3236	LDA	R1,WTFADR		MST32360
00299C	40E1 0000	3237	STH	FUT,0(R1)	INSERT DRIVE IDENTIFIER	MST32370
0029A0	41F0 330C	3238	BAL	RETN,WRIT	TO XFILE	MST32380
0029A4	41F0 32EA	3239	BAL	RETN,READ		MST32390
0029A8	41F0 3292	3240	BAL	RETN,TDATA		MST32400
0029AC	41F0 37AC	3241	BAL	R15,CNTDOWN	CONTINUE, OR EXIT.	MST32410
0029B0	0000 2942	3242	DAC	MDDATA	CONTINUATION VECTOR	MST32420



## SYSTEM TEST SEQUENCES - TEST 0D

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3244 * *****
3245 *
3246 *           T E S T   D
3247 *
3248 * PURPOSE OF TEST:
3249 * TEST D CHECKS NORMAL-MODE READ/WRITE OPERATIONS WITH A WORST-CASE
3250 * DATA PATTERN SELECTED BY THE USER. ONE OR TWO SECTORS, SPECIFIED BY
3251 * THE SECTOR, LOCYL, AND BUFSIZ OPTIONS, ARE TESTED.
3252 *
3253 * ASSUMPTIONS:
3254 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3255 * ALTERNATE CHANNEL. THE DISC PACK USED MUST BE PROPERLY FORMATTED.
3256 * 64 ADDRESS MARKS PER TRACK ARE ASSUMED.
3257 *
3258 * DESIGN SPECIFICATIONS:
3259 * THE DATA BUFFER IS FILLED WITH WORST-CASE DATA, SPECIFIED BY THE
3260 * 'DATA' OPTION. THE DATA IS WRITTEN TO THE SPECIFIED SECTOR(S),
3261 * READ BACK, AND/OR TESTED, ACCORDING TO THE SCOPE OPTION SELECTED.
3262 * THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY
3263 * IS DEPRESSED.
3264 *
3265 * HOW TO RUN THE TEST:
3266 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3267 * SECTOR, BUFSIZ, AND SCOPE OPTIONS, AND ENTER 'RUN'.
3268 * NO MANUAL INTERVENTION IS NECESSARY.
3269 *
3270 * OPTIONS:
3271 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
3272 * BUFSIZ, SCOPE, BYCKAD, INBUF, OUTBUF
3273 *
3274 * ERRORS:
3275 * 0D0000 - 0DFFFF
3276 *
0029B4 41F0 1F92 3277 TESTD BAL RETN,MODINIT
0029B8 0082 3278 DCX 0082 NO ABORT; TSECT.
0029BA C800 0201 3279 LHI R0,X'0201' NORMAL MODE COMMANDS
0029BE 40C0 1896 3280 STH R0,WCMD
0029C2 C800 00FF 3281 LHI R0,LRECL-1 SET SIZE TO 256
0029C6 4880 175A 3282 LH WK2,BUFSIZ+6 CHECK SIZE OPTION
0029CA 2333 3283 BZS TSTD.1
0029CC C800 01FF 3284 LHI R0,2*LRECL-1 OPTION = 1
0029D0 50C0 1900 3285 TSTD.1 STA R0,SIZE STORE THE # OF BYTES
0029D4 41F0 322A 3286 BAL R15,WCASFILL FILL BUFFER WITH WORST-CASE DATA

3288 *-----ACTUAL SCOPE LOOP STARTS HERE
0029D8 E600 29E8 3289 SCOP LDAI R0,SCOP2
0029DC 50C0 1934 3290 STA R0,RERN
0029E0 C8C0 05DC 3291 LHI R0,1500
0029E4 4000 18E6 3292 STH R0,COUNTER
0029E8 4800 1742 3293 SCOP2 LH R0,SCOPE+6 1 = READ; 2 = WRITE
3294 * 0 = WRITE/READ; 3 = WRITE/READ/TEST
0029EC 233E 3295 BZS SCOP3

```

## SYSTEM TEST SEQUENCES - TEST 0D

0029EE	2702	3296	SIS	R0,2		MST32960
0029F0	211E	3297	BMS	SCOP4	BRANCH: SCOPE = 1	MST3297C
0029F2	2338	3298	BZS	SCOP6	BRANCH: SCOPE = 2	MST32980
0029F4	41F0 330C	3299	BAL	RETN,WRIT	SCOPE=3	MST32990
0029F8	41F0 32EA	3300	BAL	RETN,READ		MST33000
0029FC	41F0 3292	3301	BAL	RETN,TDATA		MST33010
002A00	2308	3302	BS	SCOP5		MST33020
002A02	41F0 330C	3303	BAL	RETN,WRIT		MST33030
002A06	2305	3304	BS	SCOP5		MST33040
002A08	41F0 330C	3305	BAL	RETN,WRIT	WRITE	MST3305C
002A0C	41F0 32EA	3306	BAL	RETN,READ	READ	MST33060
002A10	41F0 37AC	3307	BAL	R15,CNTDOWN	CONTINUE, OR EXIT.	MST33070
002A14	0000 29E8	3308	DAC	SCOP2	CONTINUATION VECTOR	MST33080

## SYSTEM TEST SEQUENCES - TEST 0E

	3310	*	*****		MST33100
	3311	*			MST33110
	3312	*	TEST E		MST33120
	3313	*			MST33130
	3314	*	PURPOSE OF TEST:		MST33140
	3315	*	TEST E CHECKS FORMAT-MODE READ/WRITE OPERATIONS WITH A WORST-CASE		MST33150
	3316	*	DATA PATTERN SELECTED BY THE USER. ONE OR TWO SECTORS, SPECIFIED BY		MST33160
	3317	*	THE SECTOR, LOCYL, AND BUFSIZ OPTIONS, ARE TESTED.		MST33170
	3318	*			MST33180
	3319	*	ASSUMPTIONS:		MST33190
	3320	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE		MST33200
	3321	*	ALTERNATE CHANNEL. IF SCOPE = 1, THE DISC PACK USED MUST BE		MST33210
	3322	*	PROPERLY FORMATTED. THE CONTROLLER MUST BE IN THE FORMAT MODE.		MST33220
	3323	*			MST33230
	3324	*	DESIGN SPECIFICATIONS:		MST33240
	3325	*	THE DATA BUFFER IS FILLED WITH CORRECT HEADER AND GAP INFORMATION,		MST33250
	3326	*	AND WORST-CASE DATA, SPECIFIED BY THE 'DATA' OPTION. THE DEF SEC		MST33260
	3327	*	AND WRT PROT BITS ARE RESET. THE DATA IS WRITTEN TO THE SPECIFIED		MST33270
	3328	*	SECTOR(S), READ BACK, AND/OR TESTED, ACCORDING TO THE SCOPE OPTION		MST33280
	3329	*	SELECTED.		MST33290
	3330	*	THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY		MST33300
	3331	*	IS DEPRESSED.		MST33310
	3332	*			MST33320
	3333	*	HOW TO RUN THE TEST:		MST33330
	3334	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,		MST33340
	3335	*	SECTOR, BUFSIZ, AND SCOPE OPTIONS, AND ENTER 'RUN'.		MST33350
	3336	*	NO MANUAL INTERVENTION IS NECESSARY.		MST33360
	3337	*			MST33370
	3338	*	OPTIONS:		MST33380
	3339	*			MST33390
	3340	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,		MST33400
	3341	*	BUFSIZ, SCOPE, INBUF, OUTBUF		MST33410
	3342	*			MST33420
	3343	*	ERRORS:		MST33430
	3344	*	0E0000 - 0EFFFF		MST33440
	3345	*			MST33450
002A18	41F0 1F92	3346	TESTE BAL RETN,MODINIT		MST33460
002A1C	0083	3347	DCX 0083	EVALUATE; NO ABORT; TSECT	MST33470
002A1E	C800 0113	3348	LHI R0,PRECL-1	1 SECTOR SIZE	MST33480
002A22	4810 175A	3349	LH R1,BUFSIZ+6		MST33490
002A26	2333	3350	BZS TSPE.1		MST33500
002A28	C800 0227	3351	LHI R0,2*PRECL-1	2 SECTOR SIZE	MST33510
002A2C	5000 1900	3352	TSPE.1 STA R0,SIZE	SET TRANSFER SIZE	MST33520
002A30	2611	3353	AIS R1,1		MST33530
002A32	4860 1736	3354	LH WKO,DATA+6	GET DATA PATTERN	MST33540
002A36	41F0 314E	3355	BAL RETN,FMSUDFA	SET UP SECTOR BUFFER(S)	MST33550
002A3A	41F0 3510	3356	BAL R15,HEADER	SET UP GOOD FORMAT HEADER	MST33560
002A3E	4800 18C0	3357	LH R0,LRCC		MST33570
002A42	4001 0112	3358	STH R0,PRECL-2(R1)		MST33580
002A46	4001 0226	3359	STH R0,2*PRECL-2(R1)		MST33590
002A4A	D360 16CA	3360	LB WKO,SECTOR+6	GET STARTING HEAD	MST33600
002A4E	C80D 0001	3361	LHI R0,1(SECT)	SET UP SECOND SECTOR	MST33610
002A52	C5C0 0041	3362	CLHI R0,MAXSEC+1	(MAY USE SECTOR X'40')	MST33620
002A56	2183	3363	ELS TSPE.2	.	MST33630

## SYSTEM TEST SEQUENCES - TEST 0E

002A58	2400	3364	LIS	RO,0	.		MST33640
002A5A	2661	3365	AIS	WK0,1	.	HEAD BOUNDARY	MST33650
002A5C	0876	3366	LDAR	WK1,WK0	.		MST33660
002A5E	917A	3367	SLHLS	WK1,10	.		MST33670
002A60	067B	3368	OAR	WK1,TRACK	.		MST33680
002A62	9078	3369	SRHLS	WK1,8	.		MST33690
002A64	D201 0114	3370	STB	RO,PRECL(R1)	.		MST33700
002A68	D271 0115	3371	STB	WK1,PRECL+1(R1)	.		MST33710
002A6C	D2E1 0116	3372	STB	TRACK,PRECL+2(R1)	.		MST33720
		3373	*				MST33730
002A70	C800 0605	3374	LHI	RO,X'0605'	.	FORMAT WRITE/READ CMDS	MST33740
002A74	4000 1896	3375	STH	RO,WCMD	.		MST33750
002A78	4300 29D8	3376	B	SCOP	.		MST33760

## SYSTEM TEST SEQUENCES - TEST OF

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3378 * *****
3379 *
3380 *           T E S T   F
3381 *
3382 * PURPOSE OF TEST:
3383 * TEST F FORMATS A SINGLE SECTOR WITH THE DEF SEC BIT SET IN THE
3384 * SECTOR HEADER, THEN CHECKS NORMAL-MODE READ/WRITE OPERATIONS ON THE
3385 * SAME SECTOR.
3386 *
3387 * ASSUMPTIONS:
3388 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3389 * ALTERNATE CHANNEL. SCOPE = 1 OR SCOPE = 3 ARE INVALID OPTIONS.
3390 * THE CONTROLLER MUST BE IN THE FORMAT MODE.
3391 *
3392 * DESIGN SPECIFICATIONS:
3393 * THE DATA BUFFER IS FILLED WITH CORRECT HEADER AND GAP INFORMATION,
3394 * AND WORST-CASE DATA SPECIFIED BY THE 'DATA' OPTION. THE DEF SEC BIT
3395 * IS SET, AND THE WRT PROT BIT IS RESET. THE DATA IS WRITTEN TO THE
3396 * SPECIFIED SECTOR IN THE FORMAT MODE, THEN ATTEMPTS ARE MADE TO WRITE
3397 * AND/OR READ THE SECTOR IN NORMAL MODE, ACCORDING TO THE SCOPE OPTION
3398 * ENTERED. DEF SEC STATUS IS EXPECTED FOR ALL NORMAL-MODE DATA
3399 * TRANSFER ATTEMPTS.
3400 * THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY
3401 * IS DEPRESSED.
3402 *
3403 * HOW TO RUN THE TEST:
3404 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3405 * SECTOR, AND SCOPE OPTIONS, AND ENTER 'RUN'.
3406 * NO MANUAL INTERVENTION IS REQUIRED.
3407 *
3408 * OPTIONS:
3409 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
3410 * SCOPE, INBUF, OUTBUF
3411 *
3412 * ERRORS:
3413 * 0F0000 - OFFFFF
3414 *
002A7C 41F0 1F92
002A80 0093
3415 TESTF  BAL  RETN,MODINIT
3416         DCX  0093
3417 *
002A82 E6C0 3DE4
002A86 50C0 1938
002A8A 4860 1736
002A8E 41F0 314C
002A92 41F0 3510
002A96 4800 18C0
002A9A 4CC1 0112
002A9E C87D 0080
002AA2 D271 0900
3418         LDAI  R0,PBLK08
3419         STA  R0,RXERFL
3420         LH   WK0,DATA+6
3421         BAL  RETN,FMSUDF
3422         BAL  R15,HEADER
3423         LH   R0,LRCC
3424         STH  R0,PRECL-2(R1)
3425         LHI  WK1,X'80'(SECT)
3426         STB  WK1,0(R1)
3428 *----- COMMON PROCESS STARTS HERE
3429 *
002AA6 E5C0 2F02
3430 SCOPX  LDAI  R0,SCOP5X

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MST33780
MST33790
MST33800
MST33810
MST33820
MST33830
MST33840
MST33850
MST33860
MST33870
MST33880
MST33890
MST33900
MST33910
MST33920
MST33930
MST33940
MST33950
MST33960
MST33970
MST33980
MST33990
MST34000
MST34010
MST34020
MST34030
MST34040
MST34050
MST34060
MST34070
MST34080
MST34090
MST34100
MST34110
MST34120
MST34130
MST34140
MST34150
MST34160
MST34170
MST34180
MST34190
MST34200
MST34210
MST34220
MST34230
MST34240
MST34250
MST34260
MST34280
MST34290
MST34300

```

## SYSTEM TEST SEQUENCES - TEST OF

002AAA	5000 1934	3431	STA	RO,RERN	RERUN ADRS	MST34310
002AAE	C800 05DC	3432	LHI	RO,1500	LOOP COUNT	MST34320
002AB2	4000 18E6	3433	STH	RO,COUNTER		MST34330
002AB6	C800 0601	3434	LHI	RO,X'0601'	FORMAT WRITE/NORMAL READ	MST34340
002ABA	4000 1896	3435	STH	RO,WCMD		MST34350
002ABE	C800 0113	3436	LHI	RO,PRECL-1	TRANSFER LENGTH	MST34360
002AC2	5000 1900	3437	STA	RO,SIZE		MST34370
002AC6	41F0 330C	3438	BAL	RETN,WRIT	WRITE FAULTY SECTOR	MST34380
		3439	*			MST34390
002ACA	C800 0090	3440	LHI	OPKEY,X'90'		MST34400
002ACE	4000 18CC	3441	STH	OPKEY,OPCODE	=TESTING CTRLR ERROR STATUS	MST34410
002AD2	C800 0201	3442	LHI	RO,X'0201'	NORMAL READ/WRITE	MST34420
002AD6	4000 1896	3443	STH	RO,WCMD		MST34430
002ADA	C800 00FF	3444	LHI	RO,LRECL-1	TRANSFER SIZE	MST34440
002ADE	5000 1900	3445	STA	RO,SIZE		MST34450
002AE2	5800 1938	3446	LDA	RO,RXERFL		MST34460
002AE6	5000 193C	3447	STA	RO,ERRFLG	ERROR CHECK PBLKXX ADRS	MST34470
002AEA	4800 15CA	3448	LH	RO,BTESTNO		MST34480
002AEE	C500 0010	3449	CLHI	RO,X'10'	TEST 10 ?	MST34490
002AF2	2336	3450	BES	SCOP3X	YES- BYPASS WRITE	MST34500
002AF4	41F0 331C	3451	BAL	RETN,WRITX	ATTEMPT NORMAL WRITE	MST34510
002AF8	4800 1742	3452	LH	RO,SCOPE+6		MST34520
002AFC	2133	3453	BNZS	SCOP5X		MST34530
002AFE	41F0 32FA	3454	SCOP3X	BAL	ATTEMPT NORMAL READ	MST34540
002B02	41F0 37AC	3455	SCOP5X	BAL	CONTINUE, OR EXIT	MST34550
002B08	0000 2AB6	3456	DAC	SCOPXA	CONTINUATION VECTOR	MST34560

## SYSTEM TEST SEQUENCES - TEST 10

```

3458 * *****
3459 *
3460 *           T E S T   1 0
3461 *
3462 * PURPOSE OF TEST:
3463 * TEST 10 FORMATS A SINGLE SECTOR WITH AN INCORRECT NORMAL-MODE LRCC
3464 * CHECKWORD, THEN CHECKS NORMAL-MODE READ OPERATIONS ON THE
3465 * SAME SECTOR.
3466 *
3467 * ASSUMPTIONS:
3468 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE
3469 * CHANNEL. SCOPE = 1 OR SCOPE = 3 ARE INVALID OPTIONS. THE CONTROLLER
3470 * MUST BE IN THE FORMAT MODE.
3471 *
3472 * DESIGN SPECIFICATIONS:
3473 * THE DATA BUFFER IS FILLED WITH CORRECT HEADER AND GAP INFORMATION,
3474 * AND WORST-CASE DATA SPECIFIED BY THE 'DATA' OPTION. THE NORMAL-MODE
3475 * LRCC CHECKWORD IS FORCED INCORRECT. THE DATA IS WRITTEN TO THE
3476 * SPECIFIED SECTOR IN THE FORMAT MODE, THEN ATTEMPTS ARE MADE TO WRITE
3477 * AND/OR READ THE SECTOR IN NORMAL MODE, ACCORDING TO THE SCOPE
3478 * OPTION ENTERED. DATA TRANSFER ERROR IS EXPECTED FOR ALL NORMAL-MODE
3479 * READ ATTEMPTS.
3480 * THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BRK KEY IS
3481 * DEPRESSED.
3482 *
3483 * HOW TO RUN THE TEST:
3484 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3485 * SECTOR, AND SCOPE OPTIONS, AND ENTER 'RUN'.
3486 * NO MANUAL INTERVENTION IS REQUIRED.
3487 *
3488 * OPTIONS:
3489 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
3490 * SCOPE, INBUF, OUTBUF
3491 *
3492 * ERRORS:
3493 * 100000 - 10FFFF
3494 *
00280C 41F0 1F92 3495 TEST10  BAL  RETN,MODINIT
002810 0093 3496          DCX  0093
3497 *
002812 E600 3DE8 3498          LDAI  R0,PBLK09
002816 5000 1938 3499          STA  R0,RKERFL
00281A 4860 1735 3500          LH   WK0,DATA+6
00281E 41F0 314C 3501          BAL  RETN,FMSUDF
002822 41F0 3510 3502          BAL  R15,HEADER      ESTABLISH GOOD HEADER FIELD
002826 4800 1800 3503          LH   R0,LPCC
00282A C700 FDF0 3504          XHI  R0,'FDF0'      FORCE BAD LPCC
00282E 40C1 0112 3505          STX  R0,PRECL-2(R1)
002832 4300 2AA6 3506          B    SCOPX
MST34580
MST34590
MST34600
MST34610
MST34620
MST34630
MST34640
MST34650
MST34660
MST34670
MST34680
MST34690
MST34700
MST34710
MST34720
MST34730
MST34740
MST34750
MST34760
MST34770
MST34780
MST34790
MST34800
MST34810
MST34820
MST34830
MST34840
MST34850
MST34860
MST34870
MST34880
MST34890
MST34900
MST34910
MST34920
MST34930
MST34940
MST34950
MST34960
MST3497C
MST34980
MST34990
MST35000
MST35010
MST35020
MST35030
MST3504C
MST35050
MST35060

```

## SYSTEM TEST SEQUENCES - TEST 11

```

3508 * *****
3509 *
3510 *           T E S T   1 1
3511 *
3512 * PURPOSE OF TEST:
3513 * TEST 11 FORMATS A SINGLE SECTOR WITH AN INCORRECT CYLINDER ADDRESS
3514 * IN THE SECTOR HEADER, THEN CHECKS NORMAL-MODE READ/WRITE OPERATIONS
3515 * ON THE SAME SECTOR.
3516 *
3517 * ASSUMPTIONS:
3518 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3519 * ALTERNATE CHANNEL. SCOPE = 1 OR SCOPE = 3 ARE INVALID OPTIONS.
3520 * THE CONTROLLER MUST BE IN THE FORMAT MODE.
3521 *
3522 * DESIGN SPECIFICATIONS:
3523 * THE DATA BUFFER IS FILLED WITH CORRECT HEADER AND GAP INFORMATION,
3524 * AND WORST-CASE DATA SPECIFIED BY THE 'DATA' OPTION. THE CYLINDER
3525 * ADDRESS DATA IS FORCED INCORRECT, AND THE DATA IS WRITTEN TO THE
3526 * SPECIFIED SECTOR IN THE FORMAT MODE. ATTEMPTS ARE THEN MADE TO
3527 * WRITE AND/OR READ THE SECTOR IN NORMAL MODE, ACCORDING TO THE SCOPE
3528 * OPTION ENTERED. HEADER COMPARE FAILURE IS EXPECTED FOR ALL NORMAL-
3529 * MODE DATA TRANSFER ATTEMPTS.
3530 * THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY
3531 * IS DEPRESSED.
3532 *
3533 * HOW TO RUN THE TEST:
3534 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3535 * SECTOR, AND SCOPE OPTIONS, AND ENTER 'RUN'.
3536 * NO MANUAL INTERVENTION IS REQUIRED.
3537 *
3538 * OPTIONS:
3539 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
3540 * SCOPE, INBUF,OUTBUF
3541 *
3542 * ERRORS:
3543 * 110000 - 11FFFF
3544 *
002B36 41F0 1F92 3545 TEST11  BAL  RETN,MODINIT
002B3A 0093      3546          DCX  0093
                                3547 *          NO ABORT; EVALUATE;
002B3C E600 3DEC 3548          LDAH RO,PBLKOA          SCOPE 1,3 INVALID; TSECT.
002B40 5000 1938 3549          STA  RO,RERFL          TO TEST CTRLR STATUS = X'4E'
002B44 4860 1736 3550          LH   WKO,DATA+6
002B48 41F0 314C 3551          BAL  RETN,FMSUDF
002B4C 48B0 18B4 3552          LH   TRACK,MAXCYL
002B50 41F0 3510 3553          BAL  R15,HEADER          SET BAD TRACK IN HEADER
002B54 4800 18C0 3554          LH   RO,LRCC          COMPUTED LRCC
002B58 4001 0112 3555          STH  RO,PRECL-2(R1)
002B5C 48B0 16B2 3556          LH   TRACK,LOCYL+6
002B60 4300 2AA6 3557          B    SCOPX

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```

MST3508G
MST3509C
MST3510G
MST3511G
MST3512C
MST3513G
MST3514C
MST3515G
MST3516G
MST3517G
MST3518G
MST3519C
MST3520G
MST3521G
MST3522G
MST3523G
MST3524G
MST3525G
MST3526G
MST3527G
MST3528G
MST3529G
MST3530G
MST3531G
MST3532G
MST3533G
MST3534G
MST3535G
MST3536G
MST3537G
MST3538G
MST3539G
MST3540G
MST3541G
MST3542G
MST3543G
MST3544G
MST3545G
MST3546G
MST3547G
MST3548G
MST3549G
MST3550G
MST3551G
MST3552G
MST3553G
MST3554G
MST3555G
MST3556G
MST3557G

```



## SYSTEM TEST SEQUENCES - TEST 12

```

3559 * *****
3560 *
3561 *           T E S T   1 2
3562 *
3563 * PURPOSE OF TEST:
3564 * TEST 12 FORMATS A SINGLE SECTOR WITH AN INCORRECT HEAD ADDRESS
3565 * IN THE SECTOR HEADER, THEN CHECKS NORMAL-MODE READ/WRITE OPERATIONS
3566 * ON THE SAME SECTOR. 64 ADDRESS MARKS PER TRACK ARE ASSUMED.
3567 *
3568 * ASSUMPTIONS:
3569 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3570 * ALTERNATE CHANNEL. SCOPE = 1 OR SCOPE = 3 ARE INVALID OPTIONS.
3571 * THE CONTROLLER MUST BE IN THE FORMAT MODE.
3572 *
3573 * DESIGN SPECIFICATIONS:
3574 * THE DATA BUFFER IS FILLED WITH CORRECT HEADER AND GAP INFORMATION,
3575 * AND WORST-CASE DATA SPECIFIED BY THE 'DATA' OPTION. THE HEAD ADDRESS
3576 * DATA IS FORCED INCORRECT, AND THE DATA IS WRITTEN TO THE SPECIFIED
3577 * SECTOR IN THE FORMAT MODE. ATTEMPTS ARE THEN MADE TO WRITE AND/OR
3578 * READ THE SECTOR IN NORMAL MODE, ACCORDING TO THE SCOPE OPTION
3579 * ENTERED. HEADER COMPARE FAILURE IS EXPECTED FOR ALL NORMAL-MODE
3580 * DATA TRANSFER ATTEMPTS.
3581 * THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY
3582 * IS DEPRESSED.
3583 *
3584 * HOW TO RUN THE TEST:
3585 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3586 * SECTOR, AND SCOPE OPTIONS, AND ENTER 'RUN'.
3587 * NO MANUAL INTERVENTION IS REQUIRED.
3588 *
3589 * OPTIONS:
3590 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
3591 * SCOPE, INBUF, OUTBUF
3592 *
3593 * ERRORS:
3594 * 120000 - 12FFFF
3595 *
002B64 41F0 1F92 3596 TEST12 BAL RETN,MODINIT
002B68 0093 3597 DCX 0093
3598 * NO ABORT; EVALUATE;
3599 LDAl RO,PBLKOA SCOPE 1,3 INVALID; TSECT.
002B6E 5000 1938 3600 STA RO,PXERFL TO TEST CTRLR STATUS = X'4E'
002B72 48E0 1736 3601 LH WKO,DATA+6
002B76 41F0 314C 3602 BAL RETN,PMSUDF
002B7A 4800 12B6 3603 LH RO,MAXHEAD
002B7E 4000 18E0 3604 STH RO,HEAD
002B82 41F0 3510 3605 EAL R15,HEADER SET WRONG HEAD ADRS IN HEADER
002B86 4900 18C0 3606 LH RO,LRCC COMPUTED CKSUM
002B8A 40C1 0112 3607 STH RO,PRECL-2(P1)
002B8E D300 18CA 3608 LB RO,SECTOR+6
002B92 4000 18E0 3609 STH RO,HEAD CORRECT HEAD
002B96 4300 2AA5 3610 B SCOPY
MST3559C
MST35600
MST35610
MST35620
MST35630
MST35640
MST35650
MST35660
MST35670
MST35680
MST35690
MST35700
MST35710
MST35720
MST35730
MST35740
MST35750
MST35760
MST35770
MST35780
MST35790
MST35800
MST35810
MST35820
MST35830
MST35840
MST35850
MST35860
MST35870
MST35880
MST35890
MST35900
MST35910
MST35920
MST35930
MST35940
MST35950
MST35960
MST35970
MST35980
MST35990
MST36000
MST36010
MST36020
MST36030
MST36040
MST36050
MST36060
MST36070
MST36080
MST36090
MST36100

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## SYSTEM TEST SEQUENCES - TEST 13

```

3612 * *****
3613 *
3614 *           T E S T   1 3
3615 *
3616 * PURPOSE OF TEST:
3617 * TEST 13 PERFORMS A READ CHECK OF ANY SELECTED SECTOR.
3618 *
3619 * ASSUMPTIONS:
3620 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3621 * ALTERNATE CHANNEL. THE SELECTED SECTOR MUST BE PROPERLY FORMATTED
3622 * TO PERFORM THE READ-CHECK OPERATION SUCCESSFULLY.
3623 *
3624 * DESIGN SPECIFICATIONS:
3625 * THE SECTOR SPECIFIED BY THE LOCYL AND SECTOR OPTIONS IS USED TO
3626 * PERFORM A READ-CHECK OPERATION. ALL VALID SECTOR AND CYLINDER
3627 * ADDRESSES REFERENCED BY THE PACTYP OPTION ARE ALLOWED. NO CHECK
3628 * IS MADE FOR INVALID CYLINDER ADDRESSES ON CE PACKS.
3629 * THE TEST TERMINATES AFTER 1500 ITERATIONS, OR WHEN THE BREAK KEY
3630 * IS DEPRESSED.
3631 *
3632 * HOW TO RUN THE TEST:
3633 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3634 * AND SECTOR OPTIONS, AND ENTER 'RUN'.
3635 * NO MANUAL INTERVENTION IS REQUIRED.
3636 *
3637 * OPTIONS:
3638 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR
3639 *
3640 * ERRORS:
3641 * 130000 - 13FFFF
3642 *
002B9A 41F0 1F92 3643 TEST13 BAL RETN,MODINIT
002B9E 0082 3644 DCX 0082 NO ABORT; TSECT.
002BA0 E600 2BB4 3645 LDNI NO,TST13.1
002BA4 5000 1934 3646 STA RO,RERN
002BA8 C800 05DC 3647 LHI RO,1500
002BAC 4000 18E6 3648 STH RO,COUNTER
002BB0 41F0 36CC 3649 TST13.0 BAL RETN,CKADSRX DO READ-CHECK
002BB4 41F0 37AC 3650 TST13.1 BAL R15,CNTDOWN CONTINUE, OR EXIT
002BB8 0000 2BB0 3651 DAC TST13.0 CONTINUATION VECTOR
MST36120
MST36130
MST36140
MST36150
MST36160
MST36170
MST36180
MST36190
MST36200
MST36210
MST36220
MST36230
MST36240
MST36250
MST36260
MST36270
MST36280
MST36290
MST36300
MST36310
MST36320
MST36330
MST36340
MST36350
MST36360
MST36370
MST36380
MST36390
MST36400
MST36410
MST36420
MST36430
MST36440
MST36450
MST36460
MST36470
MST36480
MST36490
MST36500
MST36510

```

## SYSTEM TEST SEQUENCES - TEST 14

	3653	*	*****			MST36530
	3654	*				MST36540
	3655	*	TEST 14			MST36550
	3656	*				MST36560
	3657	*	PURPOSE OF TEST:			MST36570
	3658	*	TEST 14 PERFORMS A CHECK OF THE SEEK/RESTORE OPERATION BY			MST36580
	3659	*	SEEKING TO A SELECTED CYLINDER AFTER A RESTORE, OR BY SEEKING			MST36590
	3660	*	BETWEEN SELECTED CYLINDERS.			MST36600
	3661	*				MST36610
	3662	*	ASSUMPTIONS:			MST36620
	3663	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE			MST36630
	3664	*	ALTERNATE CHANNEL. THE DISC PACK MUST BE PROPERLY FORMATTED IF			MST36640
	3665	*	BYCKAD = 0. 64 ADDRESS MARKS PER TRACK ARE ASSUMED.			MST36650
	3666	*				MST36660
	3667	*	DESIGN SPECIFICATIONS:			MST36670
	3668	*	A SEEK IS MADE TO LOCYL. IF SEEK = 1, A SEEK IS THEN MADE TO HICYL;			MST36680
	3669	*	ELSE, IF SEEK = 0, THE HEADS ARE RESTORED. A READ-CHECK IS			MST36690
	3670	*	MADE ON THE HEAD AND SECTOR SPECIFIED BY THE 'SECTOR' OPTION			MST36700
	3671	*	FOLLOWING EACH SEEK OR RESTORE, UNLESS BYCKAD = 1.			MST36710
	3672	*	THE TEST TERMINATES AFTER 512 ITERATIONS IF SEEK = 0 (2048			MST36720
	3673	*	ITERATIONS IF SEEK = 1), OR WHEN THE BREAK KEY IS DEPRESSED.			MST36730
	3674	*				MST36740
	3675	*	HOW TO RUN THE TEST:			MST36750
	3676	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,			MST36760
	3677	*	HICYL, SECTOR, SEEK, AND BYCKAD OPTIONS, AND ENTER 'RUN'.			MST36770
	3678	*	NO MANUAL INTERVENTION IS REQUIRED.			MST36780
	3679	*				MST36790
	3680	*	OPTIONS:			MST36800
	3681	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, HICYL,			MST36810
	3682	*	SECTOR, SEEK, BYCKAD			MST36820
	3683	*				MST36830
	3684	*	ERRORS:			MST36840
	3685	*	140000 - 14FFFF			MST36850
	3686	*				MST36860
002BBC	41F0 1F92	3687	TEST14	BAL	RETN,MODINIT	MST36870
002BC0	0000	3688		DCX	0000	MST36880
002BC2	E600 2BFA	3689		LDAI	R0,TST14.4	MST36890
002BC6	5000 1934	3690		STA	R0,RERN	MST36900
002BCA	C810 0800	3691		LHI	R1,2048	MST36910
002BCE	4800 1772	3692		LH	R0,SEEK+6	MST36920
002BD2	2132	3693		BNZS	TST14.0	MST36930
002BD4	1012	3694		SRLS	R1,2	MST36940
002BD6	4010 18E6	3695	TST14.0	STH	R1,COUNTER	MST36950
002BDA	4190 363C	3696	TST14.1	BAL	WK3,ISECT	MST36960
002BDE	41F0 36C6	3697		BAL	REP,N,CKADSR	MST36970
002BE2	4800 1772	3698		LH	R0,SEEK+6	MST36980
002BE6	2134	3699		BNZS	TST14.2	MST36990
002BE8	41F0 368E	3700		BAL	R15,RESTORE	MST37000
002BEC	2305	3701		BS	TST14.3	MST37010
002BEE	48E0 16BE	3702	TST14.2	LH	TRACK,HICYL+6	MST37020
002BF2	41F0 351A	3703		BAL	RETN,SKSR	MST37030
002BF5	41F0 36C6	3704	TST14.3	BAL	REP,N,CKADSR	MST37040
002BFA	41F0 37AC	3705	TST14.4	BAL	R15,CNTDOWN	MST37050
002C00	0000 2BDA	3706		DAC	TST14.1	MST37060
					NO SPECIAL FLAGS	
					SET FOP 2048 ITERATIONS	
					(OR 512 ITERATIONS)	
					GET LOCYL, HEAD, SECTOR	
					SEEK = 0 : DO RESTORE	
					CONTINUE, OR EXIT	
					CONTINUATION VECTOR	

## SYSTEM TEST SEQUENCES - TEST 15

```

3708 * *****
3709 *
3710 *           T E S T   1 5
3711 *
3712 * PURPOSE OF TEST:
3713 * TEST 15 PERFORMS A NORMAL-MODE READ OF ALL SECTORS FROM LOCYL TO
3714 * HICYL INCLUSIVELY, WITH NORMAL ERROR CHECKING.
3715 *
3716 * ASSUMPTIONS:
3717 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE
3718 * ALTERNATE CHANNEL. THE DISC PACK MUST BE PROPERLY FORMATTED.
3719 * 64 ADDRESS MARKS PER TRACK ARE ASSUMED. IF 'SECNUM' IS > X'3F',
3720 * NO HEADS MAY BE DELETED.
3721 *
3722 * DESIGN SPECIFICATIONS:
3723 * A SEEK IS MADE TO 'LOCYL', AND THE FIRST NON-DELETED HEAD IS
3724 * SELECTED. (SECNUM+1) SECTORS ARE READ, WITH NORMAL ERROR CHECKING.
3725 * ALL SECTORS ARE READ FOR CYLINDERS (LOCYL-HICYL), FOR ALL NON-
3726 * DELETED HEADS. DATA ON THE DISC IS NOT DESTROYED. AUTOMATIC RE-READ
3727 * IS NOT PERFORMED; NO DISTINCTION IS MADE BETWEEN 'SOFT' AND 'HARD'
3728 * READ ERRORS.
3729 *
3730 * IN THE CASE OF SECNUM > X'3F', THE FIRST TRANSFER BEGINS WITH HEAD 0,
3731 * SECTOR 0, AND CONTINUES THROUGH THE LAST SECTOR REQUIRED. IF CYLINDER
3732 * OVERFLOW IS EXPECTED, THAT STATUS IS TESTED FOR. EACH SUBSEQUENT READ
3733 * BEGINS ON SECTOR 0 OF THE FOLLOWING HEAD, UNTIL READS HAVE BEEN
3734 * INITIATED ON ALL HEADS.
3735 *
3736 * IT IS HELPFUL TO PLACE THE READ BUFFER BELOW THE WRITE BUFFER, IF
3737 * READING VERY LARGE BLOCKS OF DATA, WITH LIMITED MEMORY. THIS PREVENTS
3738 * THE REQUIREMENT FOR A LARGE WRITE BUFFER (USE THE LAST HALFWORD
3739 * OF MEMORY), AND THE 'INVALID OUTBUF OPTION' MESSAGE.
3740 *
3741 * HOW TO RUN THE TEST:
3742 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
3743 * HICYL, SECNUM, AND BYCKAD OPTIONS, AND ENTER 'RUN'. NO MANUAL
3744 * INTERVENTION IS REQUIRED.
3745 *
3746 * OPTIONS:
3747 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL,
3748 * HICYL, SECNUM, INBUF, HEADS
3749 *
3750 * ERRORS:
3751 * 150000 - 15FFFF
3752 *
3753 TEST15  BAL      RETN,MODINIT
3754         DCX      0042          NO ABORT, SECNUM > X'3F'.
3755         LH       TRACK,LOCYL+6
3756         BAL     R15,XFERSIZL   GET 'SIZE'
3757         LHI     RO,X'0201'
3758         STH     RO,WCMD
3759 TST15.1  LDAI    RO,TST15.4
3760         STA     RO,RERN        RERUN ADRS FOR SEEK ERRORS
3761         BAL     RETN,ILLADD

```

002C04	41F0 1F92				
002C08	0042				
002C0A	48B0 16B2				
002C0E	41F0 359E				
002C12	C800 0201				
002C16	4000 1896				
002C1A	E600 2C9C				
002C1E	5000 1934				
002C22	41F0 33DA				

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MST3708C
MST3709C
MST3710C
MST3711C
MST3712C
MST3713C
MST3714C
MST3715C
MST3716C
MST3717C
MST3718C
MST3719C
MST3720C
MST3721C
MST3722C
MST3723C
MST3724C
MST3725C
MST3726C
MST3727C
MST3728C
MST3729C
MST3730C
MST3731C
MST3732C
MST3733C
MST3734C
MST3735C
MST3736C
MST3737C
MST3738C
MST3739C
MST3740C
MST3741C
MST3742C
MST3743C
MST3744C
MST3745C
MST3746C
MST3747C
MST3748C
MST3749C
MST3750C
MST3751C
MST3752C
MST3753C
MST3754C
MST3755C
MST3756C
MST3757C
MST3758C
MST3759C
MST3760C
MST3761C

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## SYSTEM TEST SEQUENCES - TEST 15

002C28	0000	2C9C	3762	DAC	TST15.4	BYPASS DESTINATION	MST37620
002C2C	41F0	361A	3763	BAL	RETN,SKSR	SEEK TRACK	MST37630
002C30	41F0	375E	3764	BAL	R15,FIRSTHD	GET FIRST NON-DELETED HEAD	MST37640
002C34	0000	2C3C	3765	DAC	TST15.1A	CONTINUATION VECTOR	MST37650
002C38	4300	1D8E	3766	B	ERROR16	INVALID 'HEADS' OPTION.	MST37660
002C3C	E600	2C8A	3767	TST15.1A	LDAI	R0,TST15.3	MST37670
002C40	5000	1934	3768	STA	R0,RERN	RERUN ADRS FOR READ ERRORS	MST37680
002C44	24D0		3769	LIS	SECT,0		MST37690
002C46	C8C0	0070	3770	TST15.2	LHI	OPKEY,X'70'	MST37700
002C4A	40C0	18CC	3771	STH	OPKEY,OPCODE	=READ OPERATION	MST37710
002C4E	2501		3772	LCS	R0,1		MST37720
002C50	5000	193C	3773	STA	R0,ERRFLG	FORCE UNCONDITIONAL RETURN	MST37730
002C54	2400		3774	LIS	R0,0	ACCUMULATE SECTOR COUNT:	MST37740
002C56	4810	18E0	3775	LH	R1,HEAD	CURRENT HEAD	MST37750
002C5A	4510	18B6	3776	TST15.2A	CLH	R1,MAXHEAD	LAST HEAD ACCOUNTED FOR ?
002C5E	2385		3777	BNLS	TST15.2B	BRANCH: YES.	MST37770
002C60	CA00	0040	3778	AHI	R0,MAXSEC	INCLUDE ANOTHER TRACK OF SECTORS	MST37780
002C64	2611		3779	AIS	R1,1	INCREMENT HEAD COUNT	MST37790
002C66	2206		3780	BS	TST15.2A		MST37800
002C68	0B0D		3781	TST15.2B	SAR	SUBTRACT SECTORS DONE, CURRENT TRACK	MST37810
002C6A	2701		3782	SIS	R0,1	ADJUST FOR SECNUM CONVENTION	MST37820
002C6C	E610	3DFC	3783	LDAI	R1,PBLKOE	TO TEST CTRLR STATUS = X'02'	MST37830
002C70	4500	1766	3784	CLH	R0,SECNUM+6	WILL CYL OVERFLOW OCCUR ?	MST37840
002C74	2383		3785	BNLS	TST15.2C	BRANCH: NO.	MST37850
002C76	E610	3DF4	3786	LDAI	R1,PBLKOC	TO TEST CTRLR STATUS = X'1E'	MST37860
002C7A	5010	1938	3787	TST15.2C	STA	SAVE PBLKNN ADDRESS;	MST37870
002C7E	41F0	32FA	3788	BAL	R15,READX	PERFORM READ	MST37880
002C82	5810	1938	3789	LDA	R1,RXERFL	RELOAD PBLKNN ADDRESS,	MST37890
002C86	E121	0000	3790	SVC	2,0(R1)	TEST RESULT OF READ.	MST37900
002C8A	41F0	3740	3791	TST15.3	BAL	R15,NEWSEC	GET NEXT SECTOR NUMBER
002C90	0000	2C46	3792	DAC	TST15.2	CONTINUATION	MST37920
002C94	41F0	3756	3793	BAL	R15,NEWHEAD	GET NEXT HEAD	MST37930
002C98	0000	2C3C	3794	DAC	TST15.1A	CONTINUATION	MST37940
002C9C	41F0	379E	3795	TST15.4	BAL	R15,NEWCYL	GET NEXT CYLINDER
002CA0	0000	2C1A	3796	DAC	TST15.1	CONTINUATION	MST37960
002CA4	4300	0E1C	3797	B	TSTEND	EXIT.	MST37970

## SYSTEM TEST SEQUENCES - TEST 16

		3799	*	*****		MST3799C
		3800	*			MST38000
		3801	*	T E S T 1 6		MST38010
		3802	*			MST38020
		3803	*	PURPOSE OF TEST:		MST3803C
		3804	*	TEST 16 READS AND WRITES SELECTED SECTORS IN THE OFFSET MODE.		MST38040
		3805	*			MST38050
		3806	*	ASSUMPTIONS:		MST38060
		3807	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE		MST38070
		3808	*	CHANNEL. THE SELECTED SECTOR(S) MUST BE PROPERLY FORMATTED.		MST38080
		3809	*	THE DRIVE MUST NOT BE WRITE-PROTECTED. 64 ADDRESS MARKS PER TRACK		MST38090
		3810	*	ARE ASSUMED.		MST3810C
		3811	*			MST38110
		3812	*	DESIGN SPECIFICATIONS:		MST38120
		3813	*	WORST-CASE DATA SPECIFIED BY THE 'DATA' OPTION IS WRITTEN TO THE		MST3813C
		3814	*	SECTORS SPECIFIED BY THE 'LOCYL', 'SECTOR', AND 'SECNUM' OPTIONS,		MST38140
		3815	*	ACCORDING TO THE 'SCOPE' OPTION. THE DATA IS THEN READ BACK, AND/OR		MST38150
		3816	*	TESTED, USING SERVO/STROBE OFFSETS ACCORDING TO THE 'OFFSET' AND		MST38160
		3817	*	'SCOPE' OPTIONS. WRITE-OFFSET IS NOT ATTEMPTED.		MST38170
		3818	*	THE FAULT LAMP ON THE DISC DRIVE SHOULD NOT LIGHT.		MST38180
		3819	*	THE TEST ABORTS AFTER 1500 ITERATIONS, OR WHEN THE 'BREAK' KEY		MST38190
		3820	*	IS DEPRESSED.		MST38200
		3821	*			MST38210
		3822	*	HOW TO RUN THE TEST:		MST38220
		3823	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,		MST38230
		3824	*	SECTOR, SCOPE, SECNUM, AND OFFSET OPTIONS, AND ENTER 'RUN'.		MST38240
		3825	*	NO MANUAL INTERVENTION IS REQUIRED.		MST38250
		3826	*			MST38260
		3827	*	OPTIONS:		MST38270
		3828	*	SELCH, DISCON, DRIVE, LOCYL, SECTOR, SECNUM, SCOPE, OFFSET		MST38280
		3829	*			MST38290
		3830	*	ERRORS:		MST38300
		3831	*	160000 - 16FFFF		MST38310
		3832	*			MST38320
002CA8	41F0 1F92	3833	TEST16	BAL	RETN,MODINIT	MST38330
002CAC	0082	3834		DCX	0082	MST38340
002CAE	080D	3835		LDAR	RO,SECT	MST38350
002CB0	4A00 1766	3836		AH	RO,SECNUM+6	MST38360
002CB4	C500 0040	3837		CLHI	RO,HAYSEC	MST38370
002CB8	4380 1D36	3838		BNL	ERROR1	MST38380
002CBC	41F0 359E	3839		BAL	R15,XFERSIZL	MST38390
002CC0	41F0 322A	3840		BAL	R15,WCAFILL	MST38400
002CC4	C800 0201	3841		LHI	RO,X'0201'	MST38410
002CC8	4000 1896	3842		STH	RO,WCMD	MST38420
002CCC	E600 2D1C	3843		LDAI	RO,TST16.6	MST38430
002CD0	5000 1934	3844		STA	RO,RERN	MST38440
002CD4	C800 05DC	3845		LHI	RO,1500	MST38450
002CD8	4000 18E6	3846		STH	RO,COUNTER	MST38460
		3847	*			MST3847C
002CDC	4800 1742	3848	TST16.1	LH	RO,SCOPE+6	MST38480
002CE0	27C1	3849		SIS	RO,1	MST38490
002CE2	2335	3850		BZS	TST16.3	MST38500
002CE4	4190 2D2C	3851		BAL	WK3,CLRNOM1	MST38510
002CE8	41F0 330C	3852		BAL	R15,WRIT	MST38520

NO ABORT; TSECT.

WILL HEAD ADVANCE OCCUR ?  
BRANCH: INVALID SECNUM OPTION  
SET UP 'SIZE'  
FILL BUFFER WITH WORST-CASE DATA

NORMAL WRITE/READ COMMANDS

RERUN ADDRESS

TEST SCOPE OPTION:  
BRANCH: SCOPE = 1 (READ ONLY)  
ESTABLISH NOMINAL OFFSETS  
WRITE DATA PATTERN, NOMINAL OFFSETS

## SYSTEM TEST SEQUENCES - TEST 16

002CEC	4800 1742	3853	*				MST38530
002CF0	2702	3854	TST16.3	LH	RO,SCOPE+6		MST38540
002CF2	4330 2D10	3855		SIS	RO,2		MST38550
002CF6	4190 2D24	3856		BZ	TST16.4	BRANCH: SCOPE = 2 (WRITE ONLY)	MST38560
002CFA	D300 174F	3857		BAL	WK3,CLRNOM	CHECK FOR CLEAR/NOMINAL OFFSETS	MST38570
002CFE	D200 189A	3858		LB	RO,OFFSET+7		MST38580
002D02	9E50	3859		STB	RO,OFFCMD		MST38590
002D04	41F0 3462	3860		OCR	FUT,RO	RE-ESTABLISH SPEC'D OFFSETS	MST38600
002D08	41F0 32EA	3861		BAL	R15,FRSSR1	WAIT FOR ALL READY.	MST38610
002D0C	E130 3DD4	3862		BAL	R15,READ	ATTEMPT NO-ERROR READ	MST38620
		3863		SVC	3,PBLK04	TEST DRIVE STATUS = X'00'	MST38630
		3864	*				MST38640
002D10	4800 1742	3865	TST16.4	LH	RO,SCOPE+6		MST38650
002D14	2703	3866		SIS	RO,3	SCOPE = 3 ?	MST38660
002D16	2133	3867		BNZS	TST16.6	BRANCH: NO.	MST38670
002D18	41F0 3292	3868		BAL	R15,TDATA	TEST DATA READ.	MST38680
		3869	*				MST38690
002D1C	41F0 37AC	3870	TST16.6	BAL	R15,CNTDOWN	LOOP, OR EXIT.	MST38700
002D20	0000 2CDC	3871		BAC	TST16.1	CONTINUATION VECTOR.	MST38710
002D24	4800 174E	3873	CLRNOM	LH	RO,OFFSET+6		MST38730
002D28	9008	3874		SRHLS	RO,8	TEST 'XX' PORTION	MST38740
002D2A	0339	3875		BZR	WK3	BRANCH: NO CLEAR/NOMINALS	MST38750
002D2C	24C0	3876	CLRNOM1	LIS	OPKEY,0		MST38760
002D2E	40C0 18CC	3877		STH	OPKEY,OPCODE	=TESTING INITIAL STATUS	MST38770
002D32	DE30 189E	3878		OC	DCAD,RESET		MST38780
002D36	DE50 189D	3879		OC	FUT,CLEAR		MST38790
002D3A	41F0 3462	3880		BAL	R15,FRSSR1	WAIT FOR ALL READY	MST38800
002D3E	C800 0030	3881		LHI	RO,X'30'		MST38810
002D42	D200 189A	3882		STB	RO,OFFCMD		MST38820
002D46	9E50	3883		OCR	FUT,RO	NOMINAL OFFSETS:	MST38830
002D48	41F0 361A	3884		BAL	R15,SKSR	RE-SEEK NOMINAL.	MST38840
002D4C	0309	3885		BR	WK3	RETURN.	MST38850

## SYSTEM TEST SEQUENCES - TEST 17

		3887	*	*****			MST38870
		3888	*				MST38880
		3889	*	T E S T 1 7			MST38890
		3890	*				MST38900
		3891	*	PURPOSE OF TEST:			MST38910
		3892	*	TEST 17 PERFORMS A SIMPLE GO/NO GO FORMATTING OPERATION ON THE			MST38920
		3893	*	TRACK SPECIFIED BY THE 'LOCYL' AND 'SECTOR' OPTIONS. TEST 17 MUST			MST38930
		3894	*	MUST BE RUN WHENEVER A TEST WRITING IN FORMAT MODE HAS BEEN RUN,			MST38940
		3895	*	TO PRESERVE THE ADDRESS-MARK SECTORING.			MST38950
		3896	*				MST38960
		3897	*	ASSUMPTIONS:			MST38970
		3898	*	THE SELECTED DISC DRIVE MUST BE ON-LINE AND NOT RESERVED TO			MST38980
		3899	*	THE ALTERNATE CHANNEL. THE CONTROLLER MUST BE IN THE FORMAT MODE.			MST38990
		3900	*	THE DRIVE MUST NOT BE WRITE-PROTECTED.			MST39000
		3901	*				MST39010
		3902	*	DESIGN SPECIFICATIONS:			MST39020
		3903	*	THE HEADS ARE SEEKED TO 'LOCYL'; THE HEAD SPECIFIED BY THE 'SECTOR'			MST39030
		3904	*	OPTION IS SELECTED. PROPER FORMAT IS WRITTEN ON EACH SECTOR, 0-X'3F',			MST39040
		3905	*	AND THE SECTOR IS READ-CHECKED. A FORMAT READ IS PERFORMED,			MST39050
		3906	*	AND THE DATA READ IS TESTED. ANY ERROR CAUSES A SECTOR TO BE FLAGGED			MST39060
		3907	*	AS DEFECTIVE; THE FLAG IS TESTED. FINALLY, THE ADDRESS MARK ON SECTOR			MST39070
		3908	*	X'40' IS ERASED, AND THE SECTOR IS READ, EXPECTING HEADER COMPARE			MST39080
		3909	*	FAILURE (TESTED IN SOFTWARE AFTER FORMAT READ). THE TEST TERMINATES.			MST39090
		3910	*	THE TEST THEN TERMINATES.			MST39100
		3911	*				MST39110
		3912	*	HOW TO RUN THE TEST:			MST39120
		3913	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, AND			MST39130
		3914	*	LOCYL OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.			MST39140
		3915	*				MST39150
		3916	*	OPTIONS:			MST39160
		3917	*	LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL,			MST39170
		3918	*	INBUF, OUTBUF, SECTOR (HEAD PORTION)			MST39180
		3919	*				MST39190
		3920	*	ERRORS:			MST39200
		3921	*	170000 - 17FFFF			MST39210
		3922	*				MST39220
002D4E	E150 1BAF	3923	REFORMAT	SVC 5,MSG32	'ATTEMPTING RE-FORMAT'		MST39230
002D52	41F0 1F92	3924	TEST17	BAL RETN,MODINIT			MST39240
002D56	8084	3925		DCX 8084	REFORMAT IN PROGRESS; TSECT;		MST39250
		3926	*		65 SECTORS.		MST39260
002D58	4860 1736	3927		LH WKO,DATA+6			MST39270
002D5C	41F0 314C	3928		BAL RETN,FMSUDF	SET UP DATA FIELD		MST39280
002D60	5810 1910	3929		LDA R1,WTFADR			MST39290
002D64	2400	3930		LIS RO,0			MST39300
002D66	4001 0112	3931		STH RO,PRECL-2(R1)			MST39310
		3932	*				MST39320
002D6A	E600 2DA2	3933		LDAI RO,REF.3	RERUN ADDRESS		MST39330
002D6E	5000 1934	3934		STA RO,RERN			MST39340
002D72	2400	3935		LIS SECT,0			MST39350
002D74	C800 0605	3936	REF.1	LHI RO,X'0605'	FORMAT WRITE/READ COMMANDS		MST39360
002D78	4000 1896	3937		STH RO,WCMD			MST39370
002D7C	41F0 3510	3938		BAL R15,HEADER	SET UP GOOD HEADER		MST39380
002D80	4800 18C0	3939		LH RO,LRCC			MST39390
002D84	4001 0112	3940		STH RO,PRECL-2(R1)	CORRECT CKSUM		MST39400



## SYSTEM TEST SEQUENCES - TEST 17

002D88	C800 0113	3941	LHI	RO,PRECL-1		MST39410
002D8C	5000 1900	3942	STA	RO,SIZE		MST39420
002D90	41F0 330C	3943	BAL	RETN,WRIT	WRITE CORRECT SECTOR	MST39430
002D94	41F0 36CC	3944	BAL	R15,CKADSRX	READ-CHECK.	MST39440
002D98	41F0 32EA	3945	BAL	RETN,READ	FORMAT READ	MST39450
002D9C	41F0 3292	3946	BAL	R15,TDATA	TEST DATA READ	MST39460
002DA0	2303	3947	BS	REF.4	CONTINUE IF NO ERRORS.	MST39470
002DA2	41F0 35BA	3948	REF.3	BAL R14,FLAGIT	FLAG SECTOR, TEST FLAG.	MST39480
002DA6	26D1	3949	REF.4	AIS SECT,1		MST39490
002DA8	C5D0 0040	3950	CLHI	SECT,MAXSEC		MST39500
002DAC	4280 2D74	3951	BL	REF.1		MST39510
		3952	*			MST39520
002DB0	E600 3D32	3953	LDAI	RO,EURC	WILL SAY 'FORMAT ABORTED' ON ERROR -	MST39530
002DB4	5000 1934	3954	STA	RO,RERN	RERUN ADDRESS	MST39540
002DB8	41F0 3542	3955	BAL	R15,ERANK	ERASE ADDRESS MARK FOR SECT X'40'	MST39550
002DBC	2501	3956	LCS	RO,1		MST39560
002DBE	5000 193C	3957	STA	RO,ERRFLG	UNCONDITIONAL RETURN:	MST39570
002DC2	41F0 32FA	3958	BAL	RETN,READX	ATTEMPT READ	MST39580
002DC6	41F0 3510	3959	BAL	R15,HEADER	SET UP SECTOR HEADER IMAGE	MST39590
002DCA	5820 190C	3960	LDA	R2,RDFADR		MST39600
002DCE	D361 0002	3961	LB	WK0,2(R1)	HEADER BYTE 3 IMAGE	MST39610
002DD2	D372 0002	3962	LB	WK1,2(R2)	HEADER BYTE 3 READ	MST39620
002DD6	0767	3963	XAR	WK0,WK1		MST39630
002DD8	4761 0000	3964	XH	WK0,0(R1)	HEADER BYTES 1 & 2 IMAGE	MST39640
002DDC	4762 0000	3965	XH	WK0,0(R2)	HEADER BYTES 1 & 2 READ	MST39650
002DE0	2336	3966	BZS	REF.6	BRANCH: HEADER MATCH, SECTOR X'40'.	MST39660
002DE2	2400	3967	LIS	RO,0		MST39670
002DE4	4000 18BC	3968	STH	RO,RFMTFLG	PROPER FORMAT RESTORED	MST39680
002DE8	4300 0E3A	3969	B	KEEP7	NORMAL EXIT: RUN ONLY ONCE .	MST39690
002DEC	2501	3970	REF.6	LCS RO,1		MST39700
002DEE	4000 15BE	3971	STH	RO,NOERR	SUPPRESS THAT PRINT	MST39710
002DF2	E150 1BE8	3972	SVC	5,MSG35	'ALTERNATE SECTOR ASSIGNED'	MST39720
002DF6	4300 3D32	3973	B	EURC	ABORT RE-FORMAT.	MST39730

## SYSTEM TEST SEQUENCES - TEST 18

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3975 * *****
3976 *
3977 *           T E S T   1 8
3978 *
3979 * PURPOSE OF TEST:
3980 * TEST 18 CHECKS PROPER OPERATION OF THE ROTATIONAL-POSITION-SENSE
3981 * LOGIC FOR THE SELECTED DRIVE, USING A SELECTABLE TRACK.
3982 *
3983 * ASSUMPTIONS:
3984 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE
3985 * CHANNEL. NO SECTORS MAY BE ALTERNATED OR DEFECTIVE. PROPER FORMAT
3986 * IS REQUIRED. THE CORRECT 'TIMVAL' OPTION *MUST* BE USED.
3987 *
3988 * DESIGN SPECIFICATIONS:
3989 * IF THE 'SCOPE' OPTION IS ZERO (0), A READ-CHECK IS PERFORMED FOR
3990 * EACH SECTOR THROUGH X'3F', AND THE RPS COUNT IS CHECKED AFTER
3991 * CONTROLLER IDLE, FOR EACH SECTOR ON THE TRACK SPECIFIED BY THE
3992 * LOCYL AND SECTOR OPTIONS.
3993 * IF THE 'SCOPE' OPTION IS NON-ZERO, THE SECTOR SPECIFIED BY THE
3994 * 'SECTOR' OPTION IS TESTED, ONLY. IN THIS CASE, THE TEST TERMINATES
3995 * AFTER 1500 ITERATIONS, OR WHEN THE 'BREAK' KEY IS DEPRESSED.
3996 * SECTOR X'40' MAY NOT BE TESTED IN THIS MODE.
3997 *
3998 * HOW TO RUN THE TEST:
3999 * ENTER THE APPROPRIATE VALUES FOR THE DISCON, DRIVE, LOCYL, SECTOR,
4000 * AND SCOPE OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION
4001 * IS REQUIRED.
4002 *
4003 * OPTIONS:
4004 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR
4005 * INBUF, SCOPE (SEE ABOVE).
4006 *
4007 * ERRORS:
4008 * 180000 - 182FFF
4009 *
002DFA 41F0 1F92 4010 TEST18 BAL RETN,MODINIT
002DFE 0083 4011 DCX 0083 TSECT; NO ABORT; EVALUATE.
002E00 C810 05DC 4012 LHI R1,1500
002E04 4010 18E6 4013 STH R1,COUNTER
002E08 4800 1742 4014 LH R0,SCOPE+6
002E0C 2134 4015 BNZS TST18.1 RUNNING SCOPE LOOP ?
002E0E 24D0 4016 LIS SECT,0 BRANCH: YES.
002E10 40D0 18BA 4017 STH SECT,FLAGS START WITH SECTOR 0
4018 * NO SPECIAL FLAGS.
002E14 41F0 36CC 4019 TST18.1 BAL R15,CKADSRX READ-CHECK THE SECTOR
002E18 C81D 0001 4020 LHI R1,1(SECT)
002E1C C510 0040 4021 CLHI R1,MAXSEC EXPECTING ZERO ?
002E20 2182 4022 BLS TST18.2 BRANCH: NO.
002E22 2410 4023 LIS R1,0 MAXSEC YIELDS COUNT = 0
002E24 4010 18CE 4024 TST18.2 STH R1,ERPSCNT EXPECTED RPS VALUE
002E28 C8C0 00B0 4025 LHI OPKEY,X'80'
002E2C 40C0 18CC 4026 STH OPKEY,OPCODE =TESTING DRIVE RPS
002E30 E180 3E1C 4027 SVC 8,PBLK22 TEST ACTUAL RPS COUNT
4028 *
MST39750
MST39760
MST39770
MST39780
MST39790
MST39800
MST39810
MST39820
MST39830
MST39840
MST39850
MST39860
MST39870
MST39880
MST39890
MST39900
MST39910
MST39920
MST39930
MST39940
MST39950
MST39960
MST39970
MST39980
MST39990
MST40000
MST40010
MST40020
MST40030
MST40040
MST40050
MST40060
MST40070
MST40080
MST40090
MST40100
MST40110
MST40120
MST40130
MST40140
MST40150
MST40160
MST40170
MST40180
MST40190
MST40200
MST40210
MST40220
MST40230
MST40240
MST40250
MST40260
MST40270
MST40280

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## SYSTEM TEST SEQUENCES - TEST 18

002E34	4800 1742	4029	TST18.3	LH	R0,SCOPE+6	SCOPE LOOP RUNNING ?	MST40290
002E38	2336	4030		BZS	TST18.4	BRANCH: NO.	MST40300
002E3A	41F0 37AC	4031		BAL	R15,CNTDOWN	LOOP OR EXIT	MST40310
002E40	0000 2E14	4032		DAC	TST18.1		MST40320
		4033	*				MST40330
002E44	26D1	4034	TST18.4	AIS	SECT,1	(NORMAL TEST)	MST40340
002E46	C5E0 0040	4035		CLHI	SECT,MAXSEC		MST40350
002E4A	4280 2E14	4036		BL	TST18.1	CONTINUE...	MST40360
002E4E	4300 0E1C	4037		B	TSTEND	OR EXIT.	MST40370

## SYSTEM TEST SEQUENCES - TEST 19

```

4039 * *****
4040 *
4041 *           T E S T   1 9
4042 *
4043 * PURPOSE OF TEST:
4044 * TEST 19 PERFORMS A TEST OF THE 'OFF-LINE' READ AND WRITE FORMAT
4045 * AND SECTOR ALTERNATION FUNCTIONS.
4046 *
4047 * ASSUMPTIONS:
4048 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE
4049 * CHANNEL. THE DRIVE MUST NOT BE WRITE-PROTECTED. THE CONTROLLER FORMAT
4050 * SWITCH MUST BE IN THE 'FORMAT' POSITION. THE TRACK USED MUST
4051 * BE DEFECT-FREE. THE CORRECT 'TIMVAL' OPTION *MUST* BE USED.
4052 *
4053 * DESIGN SPECIFICATIONS:
4054 * THE SELCH IS SET UP TO WRITE ONE HALFWORD TO THE CONTROLLER, AND THE
4055 * CONTROLLER IS COMMANDED TO 'WRITE FORMAT OFFLINE' TO THE TRACK
4056 * INDICATED BY THE 'LOCYL' AND 'SECTOR' OPTIONS. UPON COMPLETION, THE
4057 * RPS COUNT IS CHECKED. THEN, A 'READ FORMAT OFFLINE' OPERATION
4058 * IS PERFORMED, ON THE SAME TRACK. THE RPS COUNT IS AGAIN TESTED.
4059 * EACH SECTOR THROUGH AND INCLUDING X'3F' IS THEN FORMATTED WITH
4060 * CORRECT SECTOR HEADERS, AND EACH OF THESE 64 SECTORS IS READ.
4061 * THE ADDRESS MARK IS ERASED FOR THE SECTOR SPECIFIED BY THE 'SECTOR'
4062 * OPTION, AND SECTOR NUMBERS 0-3F ESTABLISHED IN THE REMAINING SECTORS.
4063 * A READ-CHECK IS PERFORMED ON LOGICAL SECTORS 0-3F WITH NORMAL ERROR
4064 * CHECKING; A REFORMAT ERASES THE ADDRESS MARK FOR SECTOR
4065 * X'40', AND THE TEST TERMINATES.
4066 *
4067 * HOW TO RUN THE TEST:
4068 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCON, DRIVE, LOCYL,
4069 * PACTYP, RETRY, SECNUN, INBUF, OUTBUF, AND SECTOR OPTIONS, THEN
4070 * ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.
4071 *
4072 * OPTIONS:
4073 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
4074 * OUTBUF, INBUF
4075 *
4076 * ERRORS:
4077 * 190000 - 19FFFF
4078 *
002E52 41F0 1F92 4079 TEST19 BAL RETN,MODINIT
002E56 0085 4080 DCX 0085 65 SECTORS; EVALUATE; TSECT.
002E58 2401 4081 LIS RO,1
002E5A 5000 1900 4082 STA RO,SIZE SET TO TRANSFER 1 HALFWORD
002E5E 41F0 322A 4083 BAL R15,WCA5FILL SET UP BUFFER
002E62 C800 0704 4084 LHI RO,X'0704' OFFLINE WRITE/READ CMDS
002E66 4000 1896 4085 STH RO,WCHD
002E6A 24C0 4086 LIS SECT,0
002E6C 40D0 18CE 4087 STH SECT,ERPSCNT SET EXPECTED RPS COUNT = 0
002E70 C8C0 0062 4088 LHI OPKEY,X'62'
002E74 40C0 18CC 4089 STH OPKEY,OPCODE =OFFLINE WRITE FORMAT
002E78 E600 3E0C 4090 LDAI RO,PBLK16 TO TEST CTRLR STATUS = X'02'
002E7C 5000 193C 4091 STA RO,ERRFLG
002E80 41F0 331C 4092 BAL RETN,WRITX OFFLINE WRITE

```

## SYSTEM TEST SEQUENCES - TEST 19

002E84	E180 3E1C	4093	SVC	8,PBLK22	TEST RPS COUNT = 0	MST40930
002E88	C8C0 0072	4094	LHI	OPKEY,X'72'		MST40940
002E8C	40C0 18CC	4095	STH	OPKEY,OPCODE	=OFFLINE READ FORMAT	MST40950
002E90	41F0 32FA	4096	BAL	RETN,READX	OFFLINE READ	MST40960
002E94	E180 3E1C	4097	SVC	8,PBLK22	TEST RPS COUNT = 0 @ CTRLR IDLE	MST40970
		4098	*			MST40980
002E98	C800 0605	4099	LHI	RO,X'0605'	FORMAT WRITE/READ CMDS	MST40990
002E9C	4000 1896	4100	STH	RO,WCHD		MST41000
002EA0	24D0	4101	LIS	SECT,0		MST41010
002EA2	C800 0113	4102	LHI	RO,PRECL-1		MST41020
002EA6	5000 1900	4103	STA	RO,SIZE		MST41030
002EAA	41F0 322A	4104	BAL	R15,WCA5FILL	FILL WRITE BUFFER FOR COMPARE:	MST41040
002EAE	41F0 32EA	4105	BAL	R15,READ	READ BACK 'OFF-LINE' DATA WRITTEN	MST41050
002EB2	41F0 3292	4106	BAL	R15,TDATA	TEST DATA READ	MST41060
002EB6	26D1	4107	AIS	SECT,1		MST41070
002EB8	C5D0 0040	4108	CLHI	SECT,MAXSEC	HAS X'3F' BEEN DONE ?	MST41080
002EBC	2087	4109	BLS	TST19.3	BRANCH: NO.	MST41090
		4110	*			MST41100
002EBE	41F0 31AC	4111	BAL	R15,FNSUDF	SET UP PROPER FORMAT	MST41110
002EC2	41F0 3510	4112	BAL	R15,HEADER	AND HEADER;	MST41120
002EC6	4800 18C0	4113	LH	RO,LRCC		MST41130
002ECA	4001 0112	4114	STH	RO,PRECL-2(R1)	CORRECT LRCC.	MST41140
002ECE	41F0 330C	4115	BAL	R15,WRIT	WRITE PROPER FORMAT.	MST41150
002ED2	26D1	4116	AIS	SECT,1		MST41160
002ED4	C5D0 0040	4117	CLHI	SECT,MAXSEC		MST41170
002ED8	208B	4118	BLS	TST19.4	CONTINUE.	MST41180
		4119	*			MST41190
002EDA	2400	4120	LIS	RO,0		MST41200
002EDC	4000 18DE	4121	STH	RO,CURSECT2	SET PHYSICAL/LOGICAL SECTOR 0	MST41210
002EE0	D3D0 18DF	4122	LB	SECT,CURSECT2+1	LOGICAL SECTOR NUMBER	MST41220
002EE4	41F0 3510	4123	BAL	R15,HEADER	SET UP SECTOR HEADER	MST41230
002EE8	D3D0 18DE	4124	LB	SECT,CURSECT2	PHYSICAL SECTOR NUMBER	MST41240
002EEC	D4D0 16CB	4125	CLB	SECT,SECTOR+7	TO BE ALTERNATED ?	MST41250
002EFO	2138	4126	BWES	TST19.6	BRANCH: NO.	MST41260
002EF2	41F0 3542	4127	BAL	R15,ERANK	ERASE ADDRESS MARK FOR IT.	MST41270
002EF6	C80D 0001	4128	LHI	RO,1(SECT)		MST41280
002EFA	D200 18DE	4129	STB	RO,CURSECT2	ADVANCE PHYSICAL SECTOR NUMBER	MST41290
002EFE	220F	4130	BS	TST19.5	CONTINUE TO NEXT...	MST41300
002F00	41F0 330C	4131	BAL	R15,WRIT	WRITE THE SECTOR.	MST41310
		4132	*			MST41320
002F04	4800 18DE	4133	LH	RO,CURSECT2	LOAD COUNTERS	MST41330
002F08	CA00 0101	4134	AHI	RO,X'0101'	AND INCREMENT.	MST41340
002F0C	4000 18DE	4135	STH	RO,CURSECT2		MST41350
002F10	9300	4136	LBR	RO,RO	EXTRACT LOGICAL SECTOR NUMBER	MST41360
002F12	C500 0040	4137	CLHI	RO,MAXSEC	ALL DONE ?	MST41370
002F16	4280 2EE0	4138	BL	TST19.5	BRANCH: NOT YET.	MST41380
		4139	*			MST41390
002F1A	24D0	4140	LIS	SECT,0		MST41400
002F1C	41F0 36CC	4141	BAL	R15,CKADSBX	READ-CHECK THE SECTOR	MST41410
002F20	C81D 0001	4142	LHI	R1,1(SECT)		MST41420
002F24	D4E0 16CB	4143	CLB	SECT,SECTOR+7	HAVE WE PASSED ALTERNATION POINT ?	MST41430
002F28	2182	4144	BLS	TST19.8A	BRANCH: NO.	MST41440
002F2A	2611	4145	AIS	R1,1		MST41450
002F2C	C510 0040	4146	CLHI	R1,MAXSEC	SHOULD RPS BE 0 ?	MST41460

## SYSTEM TEST SEQUENCES - TEST 19

002F30	2185	4147	BLS	TST19.9	BRANCH: NO.	MST41470
002F32	CE10 0040	4148	SHI	R1,MAXSEC	STILL VALID ?	MST41480
002F36	4230 3D60	4149	BNZ	TESTAUT1	BRANCH: SECTOR X'40' CHECK INVALID.	MST41490
002F3A	4010 18CE	4150	STH	R1,ERPSCNT	EXPECTED RPS COUNT.	MST41500
002F3E	E180 3E1C	4151	SVC	8,PBLK22	TEST RPS @ CTRLR IDLE	MST41510
002F42	26E1	4152	AIS	SECT,1		MST41520
002F44	C5D0 0040	4153	CLHI	SECT,MAXSEC	ALL DONE ?	MST41530
002F48	4280 2F1C	4154	BL	TST19.8	BRANCH: NO.	MST41540
002F4C	4300 3D60	4155	B	TESTAUT1	CLEAN UP TRACK.	MST41550

## SYSTEM TEST SEQUENCES - TEST 1A

	4157	*	*****		MST41570			
	4158	*			MST41580			
	4159	*	TEST 1A		MST41590			
	4160	*			MST41600			
	4161	*	PURPOSE OF TEST:		MST41610			
	4162	*	TEST 1A ENSURES THE CONTROLLER STOPS WRITING TO THE DISC WHEN		MST41620			
	4163	*	REQUIRED. DEFECT-FREE, ALTERNATED, AND DEFECTIVE-FLAGGED		MST41630			
	4164	*	ALTERNATED SECTORS ARE TESTED.		MST41640			
	4165	*			MST41650			
	4166	*	ASSUMPTIONS:		MST41660			
	4167	*	THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE		MST41670			
	4168	*	CHANNEL. THE DRIVE MUST NOT BE WRITE-PROTECTED. THE CONTROLLER FORMAT		MST41680			
	4169	*	SWITCH MUST BE IN THE 'FORMAT' POSITION.		MST41690			
	4170	*			MST41700			
	4171	*	DESIGN SPECIFICATIONS:		MST41710			
	4172	*	SECTORS X'00' - X'3D' ARE WRITTEN PROPERLY, AND SECTOR X'3E' IS		MST41720			
	4173	*	ALTERNATED TO PHYSICAL SECTOR X'3F' AFTER THE ADDRESS MARK FOR		MST41730			
	4174	*	X'3E' IS ERASED. SECTOR X'3F' IS WRITTEN TO PHYSICAL SECTOR X'40',		MST41740			
	4175	*	AND LOGICAL SECTORS X'3E' AND X'3F' ARE FLAGGED AS DEFECTIVE.		MST41750			
	4176	*	EACH SECTOR ON THE TRACK IS READ, FIRST ALL THE EVENS, THEN ALL THE		MST41760			
	4177	*	ODDS. PROPER STATUS IS REQUIRED, AS DETAILED ABOVE.		MST41770			
	4178	*	SECTOR 0 OF THE FOLLOWING HEAD IS TESTED FOR BEING OVERWRITTEN;		MST41780			
	4179	*	THE TEST THEN TERMINATES.		MST41790			
	4180	*			MST41800			
	4181	*	HOW TO RUN THE TEST:		MST41810			
	4182	*	ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCOM, DRIVE, LOCYL,		MST41820			
	4183	*	RETRY, PACTYP, AND SECTOR OPTIONS. THEN ENTER 'RUN'.		MST41830			
	4184	*	NO MANUAL INTERVENTION IS NECESSARY.		MST41840			
	4185	*			MST41850			
	4186	*	OPTIONS:		MST41860			
	4187	*	LOOP, CONTIN, SELCH, DISCOM, DRIVE, PACTYP, RETRY, LOCYL,		MST41870			
	4188	*	OUTBUF, INBUF, BYCKAD		MST41880			
	4189	*			MST41890			
	4190	*	ERRORS:		MST41900			
	4191	*	1A0000 - 1AFFFF		MST41910			
	4192	*			MST41920			
002F50	41F0	1F92	4193	TEST1A	BAL	RETN,MODINIT		MST41930
002F54	0085		4194		DCX	0085	65 SECTORS; EVALUATE; TSECT.	MST41940
002F56	C800	00FF	4195		LHI	RO,LRECL-1		MST41950
002F5A	5000	1900	4196		STA	RO,SIZE		MST41960
002F5E	41F0	322A	4197		BAL	R15,WCASFILL	FILL BUFFER W/WORST-CASE DATA	MST41970
002F62	5810	1910	4198		LDA	R1,WTFADR		MST41980
002F66	2460		4199		LIS	WKO,0		MST41990
002F68	4061	0112	4200		STH	WKO,PRECL-2(R1)	SET GOOD LRC CHECKWORD	MST42000
002F6C	41F0	314C	4201		BAL	R15,FMSUDF	SET UP SECTOR FORMAT	MST42010
002F70	25E1		4202		LCS	SECT,1		MST42020
002F72	C800	0605	4203		LHI	RO,X'0605'		MST42030
002F76	40C0	1896	4204		STH	RO,WCMD	FORMAT WRITE/READ COMMANDS	MST42040
002F7A	26E1		4205	TST1A.1	AIS	SECT,1		MST42050
002F7C	41F0	3510	4206		BAL	R15,HEADER	SET PROPER HEADER	MST42060
002F80	41F0	330C	4207		BAL	R15,WRIT	WRITE PROPER FORMAT	MST42070
002F84	C5E0	003E	4208		CLHI	SECT,MAXSEC-2	X'3E' WILL BE ALTERNATED...	MST42080
002F88	2087		4209		BLS	TST1A.1	BRANCH: NORMAL SECTORS	MST42090
			4210	*				MST42100

## SYSTEM TEST SEQUENCES - TEST 1A

002F8A	41F0	3542	4211	BAL	R15,ERANK	ERASE ADRS MARK FOR SECTOR '3E'	HST42110
002F8E	41F0	3510	4212	TST1A.2	R15,HEADER	HEADER FOR ALTERNATED SECTOR	HST42120
002F92	C8CD	0080	4213	LHI	RO,X'80'(SECT)		HST42130
002F96	D2C1	0000	4214	STB	RO,0(R1)	FLAGGED AS DEFECTIVE,	HST42140
002F9A	2611		4215	AIS	SECT,1		HST42150
002F9C	41F0	330C	4216	BAL	R15,WRIT	ALTERNATED TO X'3F' PHYSICAL.	HST42160
002FA0	C5D0	0040	4217	CLHI	SECT,MAXSEC		HST42170
002FA4	208B		4218	BLS	TST1A.2	FLAG X'3F' DEFECTIVE (@ X'40')	HST42180
			4219	*			HST42190
002FA6	C800	0201	4220	LHI	RO,X'0201'		HST42200
002FAA	40C0	1896	4221	STH	RO,WCMD	NORMAL MODE WRITE/READ COMMANDS	HST42210
002FAE	24D0		4222	LIS	SECT,0	STARTING WITH 'EVEN' SECTORS;	HST42220
002FB0	C800	00FF	4223	LHI	RO,LRECL-1		HST42230
002FB4	5000	1900	4224	STA	RO,SIZE		HST42240
002FB8	E600	3DFC	4225	TST1A.3	LDAI	RO,PBLKOE	HST42250
002FBC	C5E0	003E	4226	CLHI	SECT,MAXSEC-2	TO TEST CTRLR STATUS = X'02'	HST42260
002FC0	2183		4227	BLS	TST1A.4	WAS SECTOR FLAGGED DEFECTIVE ?	HST42270
002FC2	E6C0	3DE4	4228	LDAI	RO,PBLK08	BRANCH: NO.	HST42280
002FC6	C8C0	0070	4229	TST1A.4	LHI	OPKEY,X'70'	HST42290
002FCA	40C0	18CC	4230	STH	OPKEY,OPCODE	TO TEST CTRLR STATUS = X'2E'	HST42300
002FCE	5000	193C	4231	STA	RO,ERRFLG	=READ OPERATION	HST42310
002FD2	41F0	32FA	4232	BAL	R15,READX	ATTEMPT READ.	HST42320
002FD6	26D2		4233	AIS	SECT,2		HST42330
002FD8	C5D0	0040	4234	CLHI	SECT,MAXSEC	ALL DONE ?	HST42340
002FDC	4280	2FB8	4235	BL	TST1A.3	BRANCH: NO.	HST42350
002FE0	C8E0	0040	4236	SHI	SECT,MAXSEC	REVERT TO 0/1	HST42360
002FE4	C7D0	0001	4237	XHI	SECT,1		HST42370
002FE8	4230	2FB8	4238	BNZ	TST1A.3	CONTINUE WITH 'ODD' SECTORS...	HST42380
			4239	*			HST42390
002FEC	2400		4240	LIS	RO,0		HST42400
002FEE	9E30		4241	OCR	DCAD,RO	CLEAR COMMAND REGISTER IN CTRLR	HST42410
002FF0	41E0	347C	4242	BAL	R14,CWAIT	WAIT FOR 'IDLE'	HST42420
002FF4	000F		4243	DCX	000F		HST42430
			4244	*			HST42440
002FF6	4800	18E0	4245	LH	RO,HEAD		HST42450
002FFA	2601		4246	AIS	RO,1		HST42460
002FFC	4500	18B6	4247	CLH	RO,MAXHEAD	DOES 'NEXT HEAD' EXIST ?	HST42470
003000	2386		4248	BNLS	TST1A.5	BRANCH: NO.	HST42480
003002	4000	18E0	4249	STH	RO,HEAD		HST42490
003006	24D0		4250	LIS	SECT,0	SECTOR 0 SHOULD BE GOOD.	HST42500
003008	41F0	32EA	4251	BAL	R15,READ		HST42510
00300C	4300	3D60	4252	TST1A.5	B	CLEAN UP TRACK	HST42520



## SYSTEM TEST SEQUENCES - TEST 1B

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4254 * *****
4255 *
4256 *           T E S T   1 B
4257 *
4258 * PURPOSE OF TEST:
4259 * TEST 1B IS A SCOPE LOOP WHICH PERMITS ERASING THE ADDRESS MARK FOR
4260 * ANY SPECIFIED PHYSICAL SECTOR.
4261 *
4262 * ASSUMPTIONS:
4263 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE
4264 * CHANNEL. THE DRIVE MUST NOT BE WRITE-PROTECTED. THE CONTROLLER FORMAT
4265 * SWITCH MUST BE IN THE 'FORMAT' POSITION. SCOPE 1 & 3 INVALID.
4266 *
4267 * DESIGN SPECIFICATIONS:
4268 * THE ADDRESS MARK FOR THE SPECIFIED SECTOR IS ERASED. A NORMAL-MODE
4269 * READ OF THE SECTOR IS THEN ATTEMPTED, ACCORDING TO THE SCOPE OPTION.
4270 * THE TEST TERMINATES AFTER 1500 ITERATIONS.
4271 *
4272 * HOW TO RUN THE TEST:
4273 * ENTER THE APPROPRIATE VALUES FOR THE SELCH, DISCOM, DRIVE, LOCYL,
4274 * PACTYP, SECTOR, AND SCOPE OPTIONS. THEN ENTER 'RUN'.
4275 * THE CORRECT 'INVAL' OPTION *MUST* BE USED.
4276 * NO MANUAL INTERVENTION IS NECESSARY.
4277 *
4278 * OPTIONS:
4279 * LOOP, CONTIN, SELCH, DISCOM, DRIVE, PACTYP, RETRY, LOCYL, OUTBUF,
4280 * INBUF, SECTOR, BYCKAD, SCOPE
4281 *
4282 * ERRORS:
4283 * 1B0000 - 1BFFFF
4284 *
003010 41F0 1F92 4285 TEST1B BAL RETN,MODINIT
003014 0097 4286 DCX 0097 NO ABORT; 65 SECTORS; EVALUATE;
4287 * SCOPE 1&3 INVALID; TSECT.
003016 C800 05DC 4288 LHI RO,1500
00301A 4000 18E6 4289 STH RO,COUNTER
00301E E600 3096 4290 LDAI RO,TST1B.2
003022 5000 1934 4291 STA RO,RERN RERUN ADDRESS
003026 C800 00FF 4292 LHI RO,LRECL-1
00302A 5000 1900 4293 STA RO,SIZE
00302E 41F0 3542 4294 TST1B.1 BAL R15,ERANK ERASE SPECIFIED ADDRESS MARK
003032 C800 0205 4295 LHI RO,X'0205'
003036 4000 1896 4296 STH RO,WCMD NORMAL WRITE/FORMAT READ COMMANDS
00303A 2501 4297 LCS RO,1
00303C 5000 193C 4298 STA RO,ERRFLG UNCONDITIONAL RETURN:
003040 C800 0090 4299 LHI OPKEY,X'90' =TESTING CTRLR ERROR STATUS
003044 40C0 18CC 4300 STH OPKEY,OPCODE
003048 C800 00FF 4301 LHI RO,LRECL-1
00304C 50C0 1900 4302 STA RO,SIZE SET UP FOR ONE LOGICAL SECTOR
003050 41F0 331C 4303 BAL R15,WRITX ATTEMPT WRITE
003054 E130 3DD4 4304 SVC 3,PBLK04 TEST DRIVE STATUS = X'00'
4305 *
003058 48C0 1742 4306 LH RO,SCOPE+6
00305C 4230 3096 4307 BNZ TST1B.2 BRANCH: SCOPE = 2 (WRITE-ONLY)
MST42540
MST42550
MST42560
MST42570
MST42580
MST42590
MST42600
MST42610
MST42620
MST42630
MST42640
MST42650
MST42660
MST42670
MST42680
MST42690
MST42700
MST42710
MST42720
MST42730
MST42740
MST42750
MST42760
MST42770
MST42780
MST42790
MST42800
MST42810
MST42820
MST42830
MST42840
MST42850
MST42860
MST42870
MST42880
MST42890
MST42900
MST42910
MST42920
MST42930
MST42940
MST42950
MST42960
MST42970
MST42980
MST42990
MST43000
MST43010
MST43020
MST43030
MST43040
MST43050
MST43060
MST43070

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## SYSTEM TEST SEQUENCES - TEST 1B

003060	C8C0 0090	4308	LHI	OPKEY,X'90'	=TESTING CTRLR ERROR STATUS	MST43080
003064	40C0 18CC	4309	STH	OPKEY,OPCODE		MST43090
003068	41F0 32FA	4310	BAL	R15,READX	ATTEMPT PEAD	MST43100
00306C	E130 3DD4	4311	SVC	3,PBLK04	TEST DRIVE STATUS = X'00'	MST43110
		4312	*			MST43120
003070	41F0 3510	4313	BAL	R15,HEADER	SET UP SECTOR HEADER IMAGE	MST43130
003074	5820 190C	4314	LDA	R2,RDFADR		MST43140
003078	D361 0002	4315	LB	WK0,2(R1)	HEADER BYTE 3 IMAGE	MST43150
00307C	D372 0002	4316	LB	WK1,2(R2)	HEADER BYTE 3 READ	MST43160
003080	0767	4317	XAR	WK0,WK1		MST43170
003082	4761 0000	4318	XH	WK0,0(R1)	HEADER BYTES 1 & 2 IMAGE	MST43180
003086	4762 0000	4319	XH	WK0,0(R2)	HEADER BYTES 1 & 2 READ	MST43190
00308A	2136	4320	BNZS	TST1B.2	BRANCH: HEADER DOES NOT MATCH.	MST43200
00308C	2411	4321	LIS	R1,1		MST43210
00308E	6110 15C8	4322	AHM	R1,TOTERR	INCREMENT ETPE ERROR COUNTER	MST43220
003092	E150 1BE8	4323	SVC	5,MSG35	'ALTERNATE SECTOR ASSIGNED'	MST43230
003096	41F0 37AC	4324	BAL	R15,CNTDOWN	LOOP, OR EXIT.	MST43240
00309C	0000 302E	4325	DAC	TST1B.1	CONTINUATION VECTOR	MST43250

## SYSTEM TEST SEQUENCES - TEST 1C

```

4327 * *****
4328 *
4329 *           T E S T   1 C
4330 *
4331 * PURPOSE OF TEST:
4332 * TEST 1C PROVIDES A READ FORMAT OFF-LINE/WRITE FORMAT OFF-LINE SCOPE
4333 * LOOP FOR ANY SELECTED TRACK.
4334 *
4335 * ASSUMPTIONS:
4336 * THE SELECTED DRIVE MUST BE ON-LINE AND NOT RESERVED TO THE ALTERNATE
4337 * CHANNEL. THE DRIVE MUST NOT BE WRITE-PROTECTED. THE CONTROLLER FORMAT
4338 * SWITCH MUST BE IN THE 'FORMAT' POSITION.
4339 *
4340 * DESIGN SPECIFICATIONS:
4341 * THE TRACK IS READ/WRITTEN IN THE OFF-LINE FORMAT MODE, BEGINNING
4342 * WITH THE SECTOR SPECIFIED BY THE 'SECTOR' OPTION. FOR A WRITE, THE
4343 * SELCH IS SET UP FOR A 1-HALFWORD TRANSFER OF THE WORST-CASE DATA
4344 * PATTERN SPECIFIED BY THE 'DATA' OPTION. FOR A READ, THE SELCH IS
4345 * SET UP TO TRANSFER THE DATA FROM ONE PHYSICAL SECTOR INTO
4346 * MEMORY (NORMAL-MODE CHECKSUM BYTE IS NOT READ). IF SCOPE = 3, THE
4347 * THE DATA READ IS TESTED. THE TEST TERMINATES AFTER 1500 ITERATIONS.
4348 *
4349 * HOW TO RUN THE TEST:
4350 * ENTER THE APPROPRIATE SELCH, DISCON, DRIVE, LOCYL, SECTOR, AND SCOPE
4351 * OPTIONS, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS NECESSARY.
4352 *
4353 * OPTIONS:
4354 * LOOP, CONTIN, SELCH, DISCON, DRIVE, PACTYP, RETRY, LOCYL, SECTOR,
4355 * OUTBUF, INBUF, BYCKAD, DATA
4356 *
4357 * ERRORS:
4358 * 1C0000 - 1CFFFF
4359 *
4360 TEST1C  BAL  RETN,MODINIT
4361         DCX  0087          65 SECTS; NO ABORT; EVALUATE; TSECT.
4362         LHI  R0,1500
4363         STH  R0,COUNTER
4364         LHI  R0,X'0704'   WRITE/READ FORMAT OFF-LINE COMMANDS
4365         STH  R0,WCMD
4366         LIS  R0,0
4367         STH  R0,ERPSCNT   EXPECTED RPS COUNT
4368         LDAI R0,PBLK16   TO TEST CTRL2 STATUS = X'02'
4369         STA  R0,ERRFLG
4370 *
4371 TST1C.1 LH   R0,SCOPE+6
4372         SIS  R0,1
4373         BZ   TST1C.3     BRANCH: SCOPE = 1 (READ-ONLY)
4374         LDAI R0,TST1C.2
4375         STA  R0,PERN     RERUN ADDRESS
4376         LIS  P0,1
4377         STA  R0,SIZE     SET UP 1-HALFWORD TRANSFER.
4378         BAL  R15,WCSFILL
4379         LHI  OPKEY,X'62'
4380         STH  OPKEY,OPCODE =OFF-LINE WRITE FORMAT

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0030A0	41F0	1F92
0030A4	0087	
0030A6	C800	05DC
0030AA	4000	18E6
0030AE	C800	0704
0030B2	4000	1896
0030B6	24C0	
0030B8	4000	18CE
0030BC	E6C0	3E0C
0030C0	50C0	193C
0030C4	4800	1742
0030C8	27C1	
0030CA	4330	30F8
0030CE	F6C0	30EC
0030D2	50C0	1934
0030D6	24C1	
0030D8	50C0	1900
0030DC	41F0	322A
0030E0	C8C0	0062
0030E4	40C0	18CC

## SYSTEM TEST SEQUENCES - TEST 1C

0030E8	41F0 331C	4381	BAL	R15,WRITX		MST43810
0030EC	E600 30F8	4382	TST1C.2	LDAI	R0,TST1C.3	MST43820
0030F0	5000 1934	4383	STA	R0,RERN	BERUN ADDRESS	MST43830
0030F4	E180 3E1C	4384	SVC	8,PBLK22	TEST RPS COUNT FROM WRITE	MST43840
		4385	*			MST43850
0030F8	4800 1742	4386	TST1C.3	LH	R0,SCOPE+6	MST43860
0030FC	2702	4387	SIS	R0,2		MST43870
0030FE	4320 312A	4388	BZ	TST1C.5	BRANCH: SCOPE = 2 (WRITE ONLY)	MST43880
003102	E600 311E	4389	LDAI	R0,TST1C.4		MST43890
003106	5000 1934	4390	STA	R0,RERN	BERUN ADDRESS	MST43900
00310A	C8C0 0072	4391	LHI	OPKEY,X'72'		MST43910
00310E	40C0 18CC	4392	STH	OPKEY,OPCODE	=OFF-LINE READ FORMAT	MST43920
003112	C800 0111	4393	LHI	R0,PRECL-3	(WILL NOT READ NORMAL-MODE LRCC)	MST43930
003116	5000 1900	4394	STA	R0,SIZE	SET UP FOR 1-SECTOR TRANSFER.	MST43940
00311A	41F0 32FA	4395	BAL	R15,READX		MST43950
00311E	E600 312A	4396	TST1C.4	LDAI	R0,TST1C.5	MST43960
003122	5000 1934	4397	STA	R0,RERN	BERUN ADDRESS	MST43970
003126	E180 3E1C	4398	SVC	8,PBLK22	TEST RPS COUNT FROM READ	MST43980
		4399	*			MST43990
00312A	4800 1742	4400	TST1C.5	LH	R0,SCOPE+6	MST44000
00312E	2703	4401	SIS	R0,3		MST44010
003130	2139	4402	BNZS	TST1C.6	BRANCH: SCOPE = 0,1, OR 2.	MST44020
003132	E600 3142	4403	LDAI	R0,TST1C.6		MST44030
003136	5000 1934	4404	STA	R0,RERN	BERUN ADDRESS	MST44040
00313A	41F0 322A	4405	BAL	R15,WCASFILL	SET UP DATA IMAGE	MST44050
00313E	41F0 3292	4406	BAL	R15,TDATA	TEST DATA READ.	MST44060
		4407	*			MST44070
003142	41F0 37AC	4408	TST1C.6	BAL	R15,CNTDOWN	MST44080
003148	0000 30CA	4409	DAC	TST1C.1	LOOP, OR EXIT. CONTINUATION VECTOR	MST44090

## TEST SEQUENCE SUPPORT ROUTINES

		4411	*	FORMAT MODE DATA FIELD SETUP		MST44110
		4412	*	LHI WK0,DATABYTES		MST44120
		4413	*	BAL RETN,FMSUDF		MST44130
		4414	*	DOES NOT ESTABLISH ADDRESS FIELD OR LRCC.		MST44140
		4415	*	REGISTERS DESTROYED: R0,R1,R14,WK1,WK2,WK3		MST44150
		4416	*			MST44160
00314C	2411	4417	FMSUDF	LIS R1,1		MST44170
00314E	D300 18A5	4418	FMSUDFA	LB R0,GAP1		MST44180
003152	D3E0 18A6	4419		LB R14,SYNC		MST44190
003156	5870 1910	4420		LDA WK1,WTFADR	WRITE BUFFER ADDRESS	MST44200
00315A	C897 FFFE	4421		LHI WK3,-2(WK1)		MST44210
00315E	2711	4422	FMSU0	SIS R1,1		MST44220
003160	021F	4423		BMR RETN	RETURN.	MST44230
003162	2481	4424		LIS WK2,1		MST44240
003164	CA90 0010	4425		AHI WK3,GAPSIZE+2		MST44250
003168	D207 0003	4426	FMSU1	STB R0,3(WK1)	GAP1 BYTES	MST44260
00316C	C170 3168	4427		BXLE WK1,FMSU1		MST44270
003170	D2E9 0003	4428		STB R14,3(WK3)	SYNC BYTE	MST44280
003174	2673	4429		AIS WK1,3		MST44290
003176	2482	4430		LIS WK2,2		MST44300
003178	C897 0100	4431		LHI WK3,LRECL(WK1)		MST44310
00317C	4067 0000	4432	FMSU2	STH WK0,0(WK1)	DATA BYTES FROM CALLER	MST44320
003180	C170 317C	4433		BXLE WK1,FMSU2		MST44330
003184	4300 315E	4434		B FMSU0	TO DO WHOLE BLOCK.	MST44340
		4436	*	ROUTINE TESTS ORIGIN OF WRITE-PROTECT CONTROLLER STATUS		MST44360
		4437	*	CALLING SEQUENCE: BAL R15,STCHK		MST44370
		4438	*	DAC (CONTINUATION ON NOT WRITE-PROTECTED)		MST44380
		4439	*			MST44390
003188	9D5A	4440	STCHK	SSR FUT,STAT	GET DRIVE STATUS	MST44400
00318A	C3A0 0080	4441		THI STAT,WRTPRT	FROM DRIVE ?	MST44410
00318E	2335	4442		BZS STCHK.1	BRANCH: NO.	MST44420
003190	E150 1A4D	4443		SVC 5,MSG13	'WRITE-PROTECT ON'	MST44430
003194	4300 31BA	4444		B STCHK.3		MST44440
003198	9D3A	4445	STCHK.1	SSR DCAD,STAT	GET CONTROLLER STATUS	MST44450
00319A	C3A0 0080	4446		THI STAT,WRTPRT	FROM CONTROLLER ?	MST44460
00319E	4330 37B6	4447		BZ CONTINUE	BRANCH: NOT WRITE-PROTECT ERROR.	MST44470
0031A2	4800 18CA	4448		LH R0,RWOCMD	GET CONTROLLER COMMAND	MST44480
0031A6	10C3	4449		SRLS R0,3	FORMAT MODE ?	MST44490
0031A8	2384	4450		BNCS STCHK.2	BRANCH: NO.	MST44500
0031AA	E150 1AD5	4451		SVC 5,MSG20	'CONTROLLER FORMAT SWITCH OFF'	MST44510
0031AE	2306	4452		BS STCHK.3		MST44520
0031B0	10C2	4453	STCHK.2	SRLS R0,2	WRITE-WITH-PROTECTION ?	MST44530
0031B2	4380 37B6	4454		BVC CONTINUE	BRANCH: NO (TAKE 'DAC' TRANSFER).	MST44540
0031B6	E150 1AE8	4455		SVC 5,MSG21	'PROTECTED WRITE VIOLATION'	MST44550
0031BA	4300 374E	4456	STCHK.3	B FALLTHRU	ADVANCE PAST 'DAC' PARAMETER	MST44560
		4458	*	INTERRUPT SEEK SUBROUTINE		MST44580
		4459	*	BAL RETN2,INTSK		MST44590
		4460	*	NORMAL RETURN		MST44600

## TEST SEQUENCE SUPPORT ROUTINES

		4461	*	ENTERED WITH DESIRED CYL ADS IN REG "TRACK"		MST44610
		4462	*			MST44620
0031BE	50E0 1930	4463	INTSK	STA RETN2,INTSKR	SAVE RETURN ADDRESS	MST44630
0031C2	41F0 3422	4464		BAL R15,SETCYL		MST44640
0031C6	C8C0 0020	4465		LHI OPKEY,X'20'		MST44650
0031CA	40C0 18CC	4466		STH OPKEY,OPCODE	=SEEK OPERATION	MST44660
0031CE	DE50 18A1	4467		OC FUT,ISKCMD	INTPT SEEK TO CYL	MST44670
0031D2	C800 0200	4468	INTSK2	LHI R0,512		MST44680
0031D6	2306	4469		BS INTSK4		MST44690
		4470	*			MST44700
0031D8	480E 0000	4471	INTSK3	LH R0,0(RETN2)	CALLER'S SPECIAL TIME VALUE	MST44710
0031DC	26E2	4472		AIS RETN2,2		MST44720
0031DE	50E0 1930	4473		STA RETN2,INTSKR		MST44730
0031E2	41F0 3200	4474	INTSK4	BAL R14,ITMLP	WAIT FOR INTERRUPT	MST44740
		4476	*	SEEK INTERRUPT		MST44760
		4477	*			MST44770
0031E6	D3A0 159A	4478	SKINTA	LB STAT,INTSTA	LOAD INTERRUPT STATUS	MST44780
0031EA	58E0 1930	4479		LDA RETN2,INTSKR	LOAD RETURN ADDRESS	MST44790
0031EE	F5E0 0000 222C	4480		CLAI RETN2,TST4.1		MST44800
0031F4	033E	4481		BER RETN2	TESTING SEEK INC STATUS	MST44810
0031F6	E100 3DD4	4482		SVC 0,PBLK04	TEST DRIVE INTPT STATUS = X'00'	MST44820
0031FA	E130 3DD4	4483		SVC 3,PBLK04	TEST AGAIN (SENSE STATUS)	MST44830
0031FE	030E	4484		BR RETN2		MST44840
		4486	*	INTERRUPT TIMER LOOP		MST44860
		4487	*			MST44870
	0000 3200	4488	ITMLP	EQU *		MST44880
		4491		ELSE		MST44910
003200	7360 0A24	4492		LHL WKO,PSW3		MST44920
003204		4493		ENDC		MST44930
003204	9586	4494		EPSR WK2,WKO	ENABLE INTERRUPTS	MST44940
003206	CF00 0004	4495		SLHA R0,4	INCREASE FOR PRECISION	MST44950
00320A	4120 34F8	4496	ITML.1	BAL R2,SHALTIME		MST44960
00320E	2202	4497		BS ITML.1	TIMEOUT GIVES ERROR TTCC40	MST44970
		4499	*	ROUTINE FILLS WRITE-BUFFER WITH SPIRAL DATA		MST44990
		4500	*			MST45000
003210	5800 1900	4501	SPIFILL	LDA R0,SIZE	BYTE COUNT	MST45010
003214	2701	4502		SIS R0,1		MST45020
003216	2410	4503		LIS R1,0		MST45030
003218	5820 1910	4504	SPIF.1	LDA R2,WTFADR	GET WRITE BUFFER POINTER	MST45040
00321C	0A21	4505		AAR R2,R1		MST45050
00321E	4012 0000	4506		STH R1,0(R2)		MST45060
003222	2612	4507		AIS R1,2		MST45070
003224	0501	4508		CLAR R0,R1	ALL DONE ?	MST45080
003226	028F	4509		BLR R15	RETURN	MST45090
003228	2208	4510		BS SPIF.1		MST45100

## TEST SEQUENCE SUPPORT ROUTINES

		4512	* ROUTINE FILLS WRITE-BUFFER WITH WORST-CASE DATA			MST45120
		4513	*			MST45130
00322A	5810 1900	4514	WCASFILL LDA	R1,SIZE	BYTE COUNT	MST45140
00322E	4800 1736	4515		R0,DATA+6	WORST-CASE DATA	MST45150
003232	5820 1910	4516	WCAS.1 LDA	R2,WTFADR	GET WRITE BUFFER POINTER	MST45160
003236	0A21	4517		R2,R1		MST45170
003238	4002 40FF FFFF	4518		R0,-1(R2)		MST45180
00323E	2712	4519		R1,2		MST45190
003240	2217	4520	BNMS	WCAS.1		MST45200
003242	030F	4521	BR	R15	RETURN.	MST45210
		4523	* ROUTINE FILLS WRITE-BUFFER WITH RANDOM DATA			MST45230
		4524	*			MST45240
003244	50F0 1940	4525	RANDFILL STA	R15,TEMPA		MST45250
003248	5810 1900	4526		R1,SIZE	BYTE COUNT	MST45260
00324C	41F0 372C	4527	RAND.1 BAL	R15,RAND	GET A 'RANDOM' NUMBER	MST45270
003250	5820 1910	4528		R2,WTFADR	GET WRITE BUFFER POINTER	MST45280
003254	0A21	4529	AAR	R2,R1		MST45290
003256	4062 40FF FFFF	4530	STH	WKO,-1(R2)		MST45300
00325C	2712	4531	SIS	R1,2		MST45310
00325E	2219	4532	BNMS	RAND.1		MST45320
003260	58F0 1940	4533	LDA	R15,TEMPA		MST45330
003264	030F	4534	BR	R15	RETURN.	MST45340
		4536	* ROUTINE FILLS READ BUFFER WITH ZEROS BEFORE READ ATTEMPT			MST45360
		4537	*			MST45370
003266	2400	4538	ZEROFILL LIS	R0,0		MST45380
003268	5810 190C	4539		R1,RDFADR	GET READ BUFFER ADDRESS	MST45390
00326C	0821	4540	LDAR	R2,R1		MST45400
00326E	5A20 1900	4541	AA	R2,SIZE	GET END ADDRESS	MST45410
003272	2721	4542		R2,1		MST45420
003274	4001 0000	4543	ZERF.1 STH	R0,0(R1)		MST45430
003278	2612	4544		R1,2		MST45440
00327A	0521	4545	CLAR	R2,R1		MST45450
00327C	028F	4546	BLR	R15	RETURN	MST45460
00327E	22C5	4547	BS	ZERF.1		MST45470
		4549	* DATA TEST ROUTINE			MST45490
		4550	* BAL RETN,TDATA			MST45500
		4551	* INPUT MEMORY LOCATIONS:			MST45510
		4552	* OUTBUF = WRITTEN DATA			MST45520
		4553	* INBUF = READ DATA			MST45530
		4554	* SIZE = BUFFER BYTE COUNT			MST45540
		4555	*			MST45550
003280	26F2	4556	TDATAX AIS	RETN,2	ENTER HERE FOR BUFFER OFFSET	MST45560
003282	D00C 3EE0	4557		R0,INTSAV		MST45570
003286	5840 1910	4558	LDA	R4,WTFADR		MST45580
00328A	4A4F 40FF FFFF	4559	AH	R4,-2(RETN)	ADD OFFSET FOR READ BUFFER DATA	MST45590

## TEST SEQUENCE SUPPORT ROUTINES

003290	2305	4550	BS	TDA.0		MST45600
		4561	*			MST45610
003292	D0C0 3EE0	4562	TDATA	STM	R0,INTSAV	MST45620
003296	5840 1910	4563		LDA	R4,WTFADR	MST45630
00329A	5830 190C	4564	TDA.0	LDA	R3,RDFADR	MST45640
00329E	C8C0 0080	4565		LHI	OPKEY,X'80'	MST45650
0032A2	40C0 13CC	4566		STH	OPKEY,OPCODE	=TESTING DATA READ
0032A6	2460	4567		LIS	R6,0	START COUNT
0032A8	2472	4568		LIS	R7,2	INCREMENT
0032AA	5880 1900	4569		LDA	R8,SIZE	END COUNT
0032AE	27E1	4570		SIS	R8,1	SET TO HALFWORD BOUNDARY
0032B0	4854 0000	4571	TDA.1	LH	R5,0(R4)	EXPECTED DATA
0032B4	4553 0000	4572		CLH	R5,0(R3)	ACTUAL DATA
0032B8	2138	4573		BNES	TDA.2	BRANCH: AS EXPECTED.
0032BA	2632	4574		AIS	R3,2	
0032BC	2642	4575		AIS	R4,2	
0032BE	C160 32B0	4576		BXLE	R6,TDA.1	CONTINUE...
0032C2	D100 3EE0	4577		LM	R0,INTSAV	
0032C6	030F	4578		BR	RETN	RETURN TO CALLER
		4579	*			MST45780
0032C8	4050 18D0	4580	TDA.2	STH	R5,EDATA	FOR PRINTOUT
0032CC	4853 0000	4581		LH	R5,0(R3)	LOAD ACTUAL DATA
0032D0	4050 18D2	4582		STH	R5,RDATA	FOR PRINTOUT
0032D4	5B30 190C	4583		SA	R3,RDFADR	CONVERT LOCATION TO BYTE COUNT
0032D8	5030 1908	4584		STA	R3,BCOUNT	SAVE BYTE COUNT, ALSO
0032DC	D100 3EE0	4585		LM	R0,INTSAV	
0032E0	58F0 1924	4586		LDA	R15,RWSAVE	CALLER'S LOCATION
0032E4	E17F 40FF FFFC	4587		SVC	7,-4(R15)	LOG ERROR MESSAGE
		4588	*			(NO RETURN)
						MST45880
		4590	*	READ/WRITE ROUTINE		MST45900
		4591	*	BAL	RETN,READ	MST45910
		4592	*		OR	MST45920
		4593	*	BAL	RETN,WRIT	MST45930
		4594	*			MST45940
		4595	*	BUT IF EXPECTING ERRORS:		MST45950
		4596	*	BAL	RETN,READX	MST45960
		4597	*		OR	MST45970
		4598	*	BAL	RETN,WRITX	MST45980
		4599	*	WHICH DOES NOT CHANGE "ERRFLG" OR "OPKEY"		MST45990
		4600	*	INPUT REGISTERS:		MST46000
		4601	*	FUT	= DRIVE ADDRESS	MST46010
		4602	*	TRACK	= CYLINDER ADDRESS	MST46020
		4603	*	SLAD	= SELCH ADDRESS	MST46030
		4604	*	DCAD	= CONTROLLER ADDRESS	MST46040
		4605	*	MEMORY LOCATIONS:		MST46050
		4606	*	WCMD	= WRITE/READ CONTROLLER COMMANDS	MST46060
		4607	*	HEAD	= HEAD ADDRESS	MST46070
		4608	*	INBUF	= READ BUFFER	MST46080
		4609	*	OUTBUF	= WRITE BUFFER	MST46090
		4610	*	REGISTERS DESTROYED: R0,R6,WK0,WK1,WK2,WK3,OPKEY,STAT,RETN2		MST46100
		4611	*			MST46110



## TEST SEQUENCE SUPPORT ROUTINES

0032EA	E600	3E20	4612	READ	LDAI	RO,PBLK23	TEST CTRLR STATUS = X'02' (READ)	MST46120
0032EE	5000	193C	4613		STA	RO,ERRFLG		MST46130
0032F2	C8C0	0070	4614		LHI	OPKEY,X'70'		MST46140
0032F6	40C0	18CC	4615		STH	OPKEY,OPCODE	=PERFORMING NO-ERROR READ	MST46150
0032FA	50F0	1924	4616	READYX	STA	R15,RWSAVE		MST46160
0032FE	41F0	3266	4617		BAL	R15,ZEROFILL	MAKE VIRGIN READ BUFFER	MST46170
003302	D370	1897	4618		LB	WK1,RCMD	GET READ COMMAND	MST46180
003306	C880	0030	4619		LHI	WK2,X'30'	SELCH COMMAND	MST46190
00330A	230F		4620		BS	RWCOM	ENTER COMMON PROCESS	MST46200
			4621	*				MST46210
00330C	E600	3E0C	4622	WRIT	LDAI	RO,PBLK16	TEST CTRLR STATUS = X'02' (WRITE)	MST46220
003310	5000	193C	4623		STA	RO,ERRFLG		MST46230
003314	C8C0	0060	4624		LHI	OPKEY,X'60'		MST46240
003318	40C0	18CC	4625		STH	OPKEY,OPCODE	=PERFORMING NO-ERROR WRITE	MST46250
00331C	50F0	1924	4626	WRITX	STA	R15,RWSAVE		MST46260
003320	D370	1896	4627		LB	WK1,WCMD	WRITE COMMAND	MST46270
003324	C880	0010	4628		LHI	WK2,X'10'	SELCH COMMAND	MST46280
003328	4B70	18CA	4629	RWCOM	STH	WK1,RWOCMD	CONTROLLER COMMAND USED	MST46290
00332C	D280	18A7	4630		STB	WK2,SLCHCMD	SELCH COMMAND USED	MST46300
003330	2400		4631		LIS	RO,0		MST46310
003332	4000	18B8	4632		STH	RO,RDER	RESET 'READ-RETRIED' INDICATOR	MST46320
			4633	*				MST46330
003336	41F0	388E	4634	RDAGN	BAL	R15,SLCH	SET UP SELCH	MST46340
00333A	41F0	3438	4635		BAL	R15,SETHEAD	SET HEAD NUMBER IN DRIVE	MST46350
00333E	41F0	344C	4636		BAL	R15,SETOFF	SET HEAD/STROBE OFFSET IN DRIVE	MST46360
003342	41F0	352C	4637		BAL	R15,CHEDR	WRITE HEADER TO CONTROLLER	MST46370
003346	4800	18CA	4638	ERASX	LH	RO,RWOCMD	CONTROLLER OUTPUT COMMAND:	MST46380
00334A	C400	0006	4639		NHI	RO,X'06'	WRITE, FORMAT BITS -	MST46390
00334E	C500	0006	4640		CLHI	RO,X'06'	WRITING IN FORMAT MODE ?	MST46400
003352	2133		4641		BNES	FMTSAFE	BRANCH: NO.	MST46410
003354	4000	18BC	4642		STH	RO,RFMTFLG	YES. SET FLAG.	MST46420
003358	DE30	18CB	4643	FMTSAFE	OC	DCAD,RWOCMD+1	START CONTROLLER	MST46430
00335C	DE40	18A7	4644		OC	SLAD,SLCHCMD	START SELCH	MST46440
003360	41E0	3494	4645		BAL	R14,SWAIT	WAIT FOR SELCH & CTRLR IDLE	MST46450
003364	0200		4646		DCX	0200	TIMEOUT CONSTANT	MST46460
003366	9B50		4647		RDR	FUT,RO	READ RPS COUNT FROM DRIVE @ IDLE	MST46470
003368	4000	18E4	4648		STH	RO,RPSCNT		MST46480
00336C	E110	3DC8	4649		SVC	1,PBLK01	TEST SELCH IS IDLE.	MST46490
003370	5810	193C	4650		LDA	R1,ERRFLG		MST46500
003374	C510	FFFF	4651		CLHI	R1,-1	UNCONDITIONAL RETURN ?	MST46510
003378	4330	33D0	4652		BE	SPL.RTN	BRANCH: YES.	MST46520
00337C	E121	0000	4653		SVC	2,0(R1)	PERFORM SPECIFIED TEST	MST46530
003380	2308		4654		BS	DXTL.2R	(EXECUTED IF NO ERROR)	MST46540
003382	D3A0	159A	4655	DXTL.1	LB	STAT,ERRSTA	STATUS ON ERROR:	MST46550
003386	41F0	3188	4656		BAL	R15,STCHK	TEST IF WRITE-PROTECT PRESENT.	MST46560
00338C	00C0	3390	4657		DAC	DXTL.2R	NOT-WRITE-PROTECT PATH	MST46570
			4658	*				MST46580
003390	5810	193C	4659	DXTL.2R	LDA	R1,ERRFLG	RELOAD PBLKNN ADDRESS	MST46590
003394	F510	0000 3E20	4660		CLAI	R1,PBLK23	NO-ERROR READ ?	MST46600
00339A	4230	33C2	4661		BNE	RW.RTN	BRANCH: NO AUTO-RETRY.	MST46610
00339E	48C0	183E	4662		LH	RO,ERRFLG1	WAS ERROR DETECTED, THIS READ ?	MST46620
0033A2	2137		4663		BNZS	DXTL.4R	BRANCH: YES.	MST46630
0033A4	4800	18B8	4664		LH	RO,RDER	IS THIS 2ND READ ?	MST46640
0033A8	233D		4665		BZS	RW.RTN	BRANCH: NO ERRORS, 1ST READ.	MST46650

## TEST SEQUENCE SUPPORT ROUTINES

0033AA	E1E0 1B12	4666	SVC	5,MSG23	'SOFT READ ERROR'	MST46660
0033AE	23CA	4667	BS	RW.RTN		MST46670
0033B0	4800 18B8	4668	DXTL.4R	LH R0,RDEP	SECOND ERROR ?	MST46680
0033B4	2135	4669		BNZS DXTL.5R	BRANCH: YES.	MST46690
0033B6	40E0 18B8	4670		STH FUT,RDER	SET '1ST ERROR' FLAG	MST46700
0033BA	4300 3336	4671		B RDAGN	RETRY READ.	MST46710
0033BE	E1E0 1B02	4672	DXTL.5R	SVC 5,MSG22	'HARD READ ERROR'	MST46720
0033C2	C8C0 0G13	4673	RW.RTN	LHI OPKEY,X'13'	='RELEASE' COMMAND TO DRIVE	MST46730
0033C6	DEE0 189C	4674		OC FUT,RELEASE		MST46740
0033CA	41F0 347C	4675		BAL R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST46750
0033CE	00CF	4676		DCX 000F		MST46760
0033D0	41F0 3846	4677	SPL.RTN	BAL R14,SLCHK	TEST SELCH FINAL ADDRESS	MST46770
0033D4	58F0 1924	4678		LDA RETN,RMSAVE		MST46780
0033D8	030F	4679		BR RETN	RETURN	MST46790

4681	*	CHECKS IF THE DISC IS A CE PACK, AND IF SO	MST46810
4682	*	IS THE CURRENT CYLINDER VOID ?	MST46820
4683	*	BAL RETN,ILLADD	MST46830
4684	*	RETN2 = VOID RETURN	MST46840
4685	*	INPUT MEMORY LOCATIONS: PACTYP = CE OR USER PACK IDENTIFIER	MST46850
4686	*	REGISTERS DESTROYED: R0,R14	MST46860
4687	*		MST46870

0033DA	26F3	4688	ILLADD	AIS R15,ADC-1		MST46880
0033DC	C4F0 FFFC	4689		MHI R15,0-ADC		MST46890
0033E0	58EF 0000	4690		LDA R14,0(R15)	BYPASS ADDRESS	MST46900
0033E4	26F4	4691		AIS R15,ADC	RETURN ADDRESS	MST46910
0033E6	C800 00CE	4692		LHI R0,X'CE'	CE DISC PACK?	MST46920
0033EA	D400 16D6	4693		CLB R0,PACTYP+6		MST46930
0033EE	023F	4694		BNER RETN	NO - NORMAL RETURN	MST46940
0033F0	C5B0 0046	4695		CLHI TRACK,70	< 70	MST46950
0033F4	028F	4696		BLR RETN	OK	MST46960
0033F6	C5B0 004C	4697		CLHI TRACK,76	70-75	MST46970
0033FA	028E	4698		BLR RETN2	REJECT	MST46980
0033FC	C5B0 0073	4699		CLHI TRACK,115	76-114	MST46990
003400	028F	4700		BLR RETN	OK	MST47000
003402	C5B0 0079	4701		CLHI TRACK,121	115-120	MST47010
003406	028E	4702		BLR RETN2	REJECT	MST47020
003408	C5B0 008C	4703		CLHI TRACK,140	121-139	MST47030
00340C	028F	4704		BLR RETN	OK	MST47040
00340E	C5B0 0097	4705		CLHI TRACK,151	140-150	MST47050
003412	028E	4706		BLR RETN2	REJECT	MST47060
003414	C5E0 00E6	4707		CLHI TRACK,230	151-229	MST47070
003418	028F	4708		BLR RETN	OK	MST47080
00341A	C5B0 00F1	4709		CLHI TRACK,241	230-240	MST47090
00341E	028E	4710		BLR RETN2	REJECT	MST47100
003420	030F	4711		BR RETN	>240	MST47110

4713	*	TO WRITE CYLINDER ADDRESS TO DRIVE, SET CYLINDER	MST47130
4714	*	CALLING SEQUENCE: BAL R15,SETCYL	MST47140
4715	*	(TRACK) = CYLINDER ADRS	MST47150

## TEST SEQUENCE SUPPORT ROUTINES

		4716	*				MST47160
003422	40E0 18E2	4717	SETCYL	STH	TRACK,CURCYL	CURRENT CYLINDER NUMBER	MST47170
003426	C8C0 0010	4718		LHI	OPKEY,X'10'	=SET CYLINDER OPERATION	MST47180
00342A	985B	4719		WHR	FUT,TRACK	CYL ADRS TO DRIVE	MST47190
00342C	DE50 1898	4720		CC	FUT,CYLCMD	SET CYL # TO DRIVE	MST47200
003430	41E0 347C	4721		BAL	R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST47210
003434	000F	4722		DCX	000F		MST47220
003436	030F	4723		BR	R15	RETURN	MST47230
		4725	*	* TO WRITE HEAD ADDRESS TO DRIVE, SET HEAD			MST47250
		4726	*	* CALLING SEQUENCE: BAL R15,SETHEAD			MST47260
		4727	*	(HEAD) CONTAINS HEAD ADDRESS			MST47270
		4728	*				MST47280
003438	C8C0 0011	4729	SETHEAD	LHI	OPKEY,X'11'	=SET HEAD OPERATION	MST47290
00343C	D850 18E0	4730		WH	FUT,HEAD	HEAD ADRS TO DRIVE	MST47300
003440	DE50 1899	4731		CC	FUT,HEDCHD	SET HEAD # TO DRIVE	MST47310
003444	41E0 347C	4732		BAL	R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST47320
003448	000F	4733		DCX	000F		MST47330
00344A	030F	4734		BR	R15		MST47340
		4736	*	* ROUTINE ESTABLISHES SERVO OFFSET BEFORE TRANSFER ATTEMPT			MST47360
		4737	*				MST47370
00344C	D300 189A	4738	SETOFF	LB	RO,OFFCMD	GET HEAD/STROBE OFFSET COMMAND	MST47380
003450	0800	4739		LDAR	RO,RO	ZERO (NULL) COMMAND ?	MST47390
003452	033F	4740		BZR	R15	BRANCH: YES.	MST47400
003454	C8C0 0040	4741		LHI	OPKEY,X'40'	=SERVO/STROBE OFFSETS	MST47410
003458	9E50	4742		OCR	FUT,RO	SEND OFFSET COMMAND.	MST47420
00345A	41E0 34BC	4743		BAL	R14,DWAIT	WAIT FOR DRIVE READY	MST47430
00345E	00FF	4744		DCX	00FF		MST47440
003460	030F	4745		BR	R15	RETURN TO CALLER	MST47450
		4747	*	* FILE READY TO SEEK/READ/WRITE SUBROUTINE			MST47470
		4748	*	* CALLING SEQUENCE: BAL RETN,FRSSR			MST47480
		4749	*	* RETURN WHEN CONTROLLER IDLE & DRIVE READY.			MST47490
		4750	*				MST47500
003462	E110 3DC8	4751	FRSSR1	SVC	1,PBLK01	SELCH SHOULDN'T BE BUSY HERE	MST47510
003466	41E0 347C	4752		BAL	R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST47520
00346A	000F	4753		DCX	000F		MST47530
00346C	E130 3DD0	4754		SVC	3,PBLK03	ALTSCHAN NOT BUSY.	MST47540
003470	E130 3E04	4755		SVC	3,PBLK13	TEST DRIVE STATUS	MST47550
003474	41E0 34BC	4756		BAL	R14,DWAIT	WAIT FOR DRIVE READY	MST47560
003478	06E6	4757		DCX	06D6		MST47570
00347A	030F	4758		BR	RETN	RETURN	MST47580
		4760	*	* ROUTINE WAITS FOR 'CONTROLLER IDLE'			MST47600
		4761	*				MST47610

## TEST SEQUENCE SUPPORT ROUTINES

00347C	48CE 0000	4762	CWAIT	LH	RO,0(R14)	LOAD TIMEOUT VALUE	MST47620	
003480	CF00 0004	4763		SLHA	RO,4	INCREASE FOR PRECISION	MST47630	
003484	26E2	4764		AIS	R14,2		MST47640	
003486	4030 1598	4765		STH	DCAD,ERRDEV	FOR ERROR PRINTOUT	MST47650	
00348A	9D3A	4766	CWA.1	SSR	DCAD,STAT	CONTROLLER GOING IDLE ?	MST47660	
00348C	027E	4767		BTCR	7,R14	BRANCH: YES.	MST47670	
00348E	4120 34F8	4768		BAL	R2,SMALTIME	TEST TIMEOUT	MST47680	
003492	2204	4769		ES	CWA.1		MST47690	
		4771	* ROUTINE WAITS FOR 'SELCH IDLE'					MST47710
		4772	*					MST47720
003494	480E 0000	4773	SWAIT	LH	RO,0(R14)	LOAD TIMEOUT VALUE	MST47730	
003498	CF00 0004	4774		SLHA	RO,4	INCREASE FOR PRECISION	MST47740	
00349C	26E2	4775		AIS	R14,2		MST47750	
00349E	4040 1598	4776		STH	SLAD,ERRDEV	FOR ERROR PRINTOUT	MST47760	
0034A2	9D4A	4777	SWA.1	SSR	SLAD,STAT	SELCH IDLE ?	MST47770	
0034A4	2388	4778		BFFS	8,SWA.2	BRANCH: YES.	MST47780	
0034A6	4120 34F8	4779		BAL	R2,SMALTIME	TEST TIMEOUT	MST47790	
0034AA	9D4A	4780		SSR	SLAD,STAT		MST47800	
0034AC	2384	4781		BFFS	8,SWA.2	(FOR CRITICAL TIMING)	MST47810	
0034AE	4120 38EE	4782		BAL	R2,BACKGRND	DO BACKGROUND TESTING	MST47820	
0034B2	2208	4783		BS	SWA.1		MST47830	
		4786		ELSE			MST47860	
0034B4	DE40 18A4	4787	SWA.2	OC	SLAD,ESTOP	STOP SELCH	MST47870	
0034B8		4788		ENDC			MST47880	
0034B8	4300 348A	4789		B	CWA.1	WAIT FOR CTRLR IDLE...	MST47890	
		4791	* ROUTINE WAITS FOR 'DRIVE READY'					MST47910
		4792	*					MST47920
0034BC	480E 0000	4793	DWAIT	LH	RO,0(R14)	LOAD TIMEOUT VALUE	MST47930	
0034C0	CF00 0004	4794		SLHA	RO,4	INCREASE FOR PRECISION	MST47940	
0034C4	26E2	4795		AIS	R14,2	ADVANCE PAST PARAMETER-	MST47950	
0034C6	4050 1598	4796		STH	FUT,ERRDEV	FOR ERROR PRINTOUT	MST47960	
0034CA	9D5A	4797	DWA.1	SSR	FUT,STAT	DRIVE READY ?	MST47970	
0034CC	08AA	4798		LDAR	STAT,STAT		MST47980	
0034CE	033E	4799		BZR	R14	BRANCH: DRIVE READY.	MST47990	
0034D0	C3A0 00F7	4800		THI	STAT,X'F7'		MST48000	
0034D4	2134	4801		BNZS	DWA.2	BRANCH: BAD DRIVE STATUS.	MST48010	
0034D6	4120 34F8	4802		BAL	R2,SMALTIME	TEST TIMEOUT	MST48020	
0034DA	2208	4803		BS	DWA.1		MST48030	
0034DC	D2A0 159A	4804	DWA.2	STB	STAT,ERRSTA		MST48040	
0034E0	E100 3E2C	4805		SVC	0,PBLK30	TESTS DRIVE STATUS = X'08'	MST48050	
		4806	*				(NO RETURN)	MST48060
		4808	*					MST48080
		4809	* ONE-MILLISECOND COUNTDOWN TIMER					MST48090
		4810	* CALL SEQUENCE: LHI WK1,TIMEOUTVALUE					MST48100
		4811	* BAL R14,MILSEC					MST48110

## TEST SEQUENCE SUPPORT ROUTINES

		4812	*				MST48120
0034E4	2771	4813	MILSEC	SIS	#K1,1		MST48130
0034E6	2314	4814		BNMS	MILS1	NO TIME-OUT, YET	MST48140
0034E8	E14E 40FF FFFC	4815		SVC	4,-4(R14)	TIMEOUT; LOG MESSAGE.	MST48150
0034EE	2401	4816	MILS1	LIS	RO,1	FOR 1-MS DELAY	MST48160
0034F0	41F0 10A4	4817		BAL	R15,TIMER	ONE-MILLISECOND DELAY	MST48170
0034F4	030E	4818		BR	R14		MST48180
		4820	*	ROUTINE CHECKS TIMEOUTS IN SUB-MILLISECOND INTERVALS			MST48200
		4821	*				MST48210
0034F8		4822		ALIGN	4		MST48220
0034F8	4810 0A1C	4823	SMALTIME	LH	R1,TIME		MST48230
0034FC	1014	4824		SRLS	R1,4	DECREASE FOR PRECISION	MST48240
0034FE	2711	4825	SMAL.1	SIS	R1,1		MST48250
003500	2021	4826		BPS	SMAL.1		MST48260
003502	2701	4827		SIS	RO,1	TIMEOUT ?	MST48270
003504	0312	4828		BWR	R2	BRANCH:NOT YET.	MST48280
003506	40C0 18CC	4829		STH	OPKEY,OPCODE	SET FOR ERROR MESSAGE -	MST48290
00350A	E14F 40FF FFFC	4830		SVC	4,-4(R15)	TIMEOUT ERROR	MST48300
		4831	*			(NO RETURN)	MST48310
		4833	*	ROUTINE SETS UP SECTOR HEADER FOR ONE SECTOR			MST48330
		4834	*				MST48340
003510	4800 18E0	4835	HEADER	LH	RO,HEAD		MST48350
003514	110A	4836		SLLS	RO,10	FORMAT HEADER BYTES	MST48360
003516	060B	4837		OAR	RO,TRACK		MST48370
003518	9400	4838		EXBR	RO,RO		MST48380
00351A	5810 1910	4839		LDA	R1,WTFADR		MST48390
00351E	D2D1 0000	4840		STB	SECT,0(R1)	HEADER BYTE 0	MST48400
003522	D201 0001	4841		STB	RO,1(R1)	HEADER BYTE 1	MST48410
003526	D2B1 0002	4842		STB	TRACK,2(R1)	HEADER BYTE 2	MST48420
00352A	030F	4843		BR	R15	RETURN	MST48430
		4845	*	ROUTINE WRITES HEADER INFORMATION TO DISC CONTROLLER,			MST48450
		4846	*	HEAD ADDRESS TO DRIVE			MST48460
		4847	*				MST48470
00352C	4800 18E0	4848	CHEDR	LH	RO,HEAD		MST48480
003530	110A	4849		SLLS	RO,10		MST48490
003532	060B	4850		OAR	RO,TRACK		MST48500
003534	9A3D	4851		WDR	DCAD,SECT		MST48510
003536	9830	4852		WHR	DCAD,RO		MST48520
003538	40D0 18DC	4853		STH	SECT,CURSECT	CURRENT SECTOR NUMBER	MST48530
00353C	D850 18E0	4854		WH	FUT,HEAD	HEAD NUMBER REGISTER, MULTI-DRIVE	MST48540
003540	03CF	4855		BR	R15	RETURN	MST48550
		4857	*	ROUTINE CAUSES ADDRESS MARK FOR SPECIFIED SECTOR TO BE ERASED.			MST48570



## TEST SEQUENCE SUPPORT ROUTINES

0035CA	41F0 330C	4908	BAL	RETN,WRIT	WRITE WITH DEF SEC FLAG SET	MST49080	
0035CE	E6E0 10E8	4909	LDAI	R14,HEXASC		MST49090	
0035D2	081B	4910	LDAR	R1,TRACK		MST49100	
0035D4	2403	4911	LIS	R0,3		MST49110	
0035D6	E620 19F0	4912	LDAI	R2,MSG05+16		MST49120	
0035DA	01FE	4913	BALR	R15,R14	BUILD FLAG MESSAGE...	MST49130	
0035DC	4810 18E0	4914	LH	R1,HEAD		MST49140	
0035E0	2402	4915	LIS	R0,2		MST49150	
0035E2	E620 19F4	4916	LDAI	R2,MSG05+20		MST49160	
0035E6	01FE	4917	BALR	R15,R14		MST49170	
0035E8	081D	4918	LDAR	R1,SECT		MST49180	
0035EA	E620 19F7	4919	LDAI	R2,MSG05+23		MST49190	
0035EE	01FE	4920	BALR	R15,R14		MST49200	
0035F0	E150 19E0	4921	SVC	5,MSG05	'DEF SEC FLAGGED...'	MST49210	
		4922	*			MST49220	
0035F4	2401	4923	LIS	R0,X'0001'	NORMAL READ COMMAND, ONLY.	MST49230	
0035F6	4000 1896	4924	STH	R0,WCMD		MST49240	
0035FA	C8C0 0093	4925	LHI	OPKEY,X'93'	=TESTING FOR CTRLR ERROR STATUS	MST49250	
0035FE	40C0 18CC	4926	STH	OPKEY,OPCODE	(DEFECTIVE SECTOR)	MST49260	
003602	E600 3E24	4927	LDAI	R0,PBLK25	TO TEST CTRL STATUS = X'2E'	MST49270	
003606	5000 193C	4928	STA	R0,ERRFLG		MST49280	
00360A	41F0 32FA	4929	BAL	RETN,READX	TEST SECTOR FLAG	MST49290	
00360E	2303	4930	BS	FLAG.1	(EXECUTED ON NO ERROR)	MST49300	
003610	E150 19FA	4931	FLAG.0	SVC	'FLAG REJECTED'	MST49310	
003614	58E0 1928	4932	FLAG.1	LDA	R14,FLGRM	MST49320	
003618	030E	4933	BR	R14	RETURN	MST49330	
		4935	*	SEEK SUBROUTINE		MST49350	
		4936	*	BAL	RETN,SKSR	DESIRED CYL ADS IN "TRACK"	MST49360
		4937	*	INPUT REGISTERS:		MST49370	
		4938	*	TRACK = CYLINDER ADDRESS		MST49380	
		4939	*	FUT = DRIVE ADDRESS		MST49390	
		4940	*	DCAD = CONTROLLER ADDRESS		MST49400	
		4941	*			MST49410	
00361A	50F0 192C	4942	SKSR	STA	RETN,SKRTN	SAVE RETURN	MST49420
00361E	41F0 3422	4943	BAL	R15,SETCYL	WRITE CYL ADRS TO DRIVE	MST49430	
003622	C8C0 0020	4944	LHI	OPKEY,X'20'		MST49440	
003626	40C0 18CC	4945	STH	OPKEY,OPCODE	=SEEK OPERATION	MST49450	
00362A	DE50 189F	4946	OC	FUT,SEEKC	SEEK CMD TO DRIVE	MST49460	
00362E	41F0 3462	4947	BAL	RETN,FRSSR1	RETURN WHEN DRIVE READY	MST49470	
003632	E130 3DD4	4948	SVC	3,PBLK04	TEST DRIVE STATUS = X'00'	MST49480	
003636	58F0 192C	4949	LDA	RETN,SKRTN		MST49490	
00363A	030F	4950	BR	RETN	RETURN	MST49500	
		4952	*	ROUTINE SEEKS (LOCYL), SETS UP REGISTER SECT AND LOCATION HEAD FROM		MST49520	
		4953	*	THE SPECIFIED (SECTOR) OPTION.		MST49530	
		4954	*	CALLING SEQUENCE: BAL WK3,TSECT OR BAL WK3,TSECTA		MST49540	
		4955	*	REGISTERS DESTROYED: WK0,R14,WK1,R0		MST49550	
		4956	*			MST49560	
00363C	48E0 16B2	4957	TSECT	LH	TRACK,LOCYL+6	MST49570	

## TEST SEQUENCE SUPPORT ROUTINES

003640	41F0 33DA	4958	BAL	R15, ILLADD	TEST CE PACK VOID AREAS	MST49580
003644	0000 1D6C	4959	DAC	ERROR11		MST49590
003648	41F0 361A	4960	BAL	RETN, SKSR	SEEK LOCYL	MST49600
00364C	4860 16CA	4961	TSECTA	LH	(HEAD:SECTOR)	MST49610
003650	93C6	4962	LBR	SECT, WKO	GET SECTOR	MST49620
003652	48C0 183A	4963	LH	RO, FLAGS	LOOK AT MODULE FLAGS.	MST49630
003656	1003	4964	SRLS	RO, 3	65 SECTORS/TRACK ALLOWED ?	MST49640
003658	2185	4965	BCS	TSECT.1	BRANCH: YES.	MST49650
00365A	C5D0 0040	4966	CLHI	SECT, MAXSEC	NO. VALID SECTOR NUMBER ?	MST49660
00365E	4380 1D4E	4967	BNL	ERROR5	BRANCH: NO.	MST49670
003662	9068	4968	TSECT.1	SRHLS	WKO, 8	MST49680
003664	4060 18E0	4969	STH	WKO, HEAD	GET HEAD	MST49690
003668	40D0 18DC	4970	STH	SECT, CURSECT	CURRENT SECTOR NUMBER	MST49700
00366C	0309	4971	BR	WK3	RETURN.	MST49710
		4973		* ROUTINE WRITES (OFFSET-CYLINDER-HEAD-SECTOR) TO DISPLAY PANEL		MST49730
		4974		* REGISTERS DESTROYED: RO, R1		MST49740
		4975		*		MST49750
00366E	2411	4976	DISPLAY	LIS	R1, 1	MST49760
003670	DE10 159D	4977		OC	R1, INCR	MST49770
003674	DA10 18DD	4978		WD	R1, CURSECT+1	MST49780
003678	DA10 18E1	4979		WD	R1, HEAD+1	MST49790
00367C	4800 18E2	4980		LH	RO, CURCYL	MST49800
003680	9400	4981		EXBR	RO, RO	MST49810
003682	9810	4982		WHR	R1, RO	MST49820
003684	DA10 189A	4983		WD	R1, OFFCMD	MST49830
003688	DE10 159C	4984		OC	R1, NORM	MST49840
00368C	030F	4985		BR	RETN	MST49850
		4987		* RESTORE SUBROUTINE		MST49870
		4988		* BAL RETN, RSTSR		MST49880
		4989		* RETURNS WITH (TRACK) = 0.		MST49890
		4990		*		MST49900
00368E	50F0 1920	4991	RESTORE	STA	RETN, RSRET	MST49910
003692	E130 3DD0	4992		SVC	3, PBLK03	MST49920
003696	C8C0 0030	4993		LHI	OPKEY, X'30'	MST49930
00369A	40C0 18CC	4994		STH	OPKEY, OPCODE	MST49940
00369E	DE50 18A0	4995		OC	FUT, RESTOC	MST49950
0036A2	41E0 347C	4996		BAL	R14, CWAIT	MST49960
0036A6	000F	4997		DCX	000F	MST49970
0036A8	41E0 34BC	4998		BAL	R14, DWAIT	MST49980
0036AC	06D6	4999		DCX	06D6	MST49990
0036AE	24E0	5000		LIS	TRACK, 0	MST50000
0036B0	40B0 18E2	5001		STH	TRACK, CURCYL	MST50010
0036B4	58F0 1920	5002		LDA	RETN, RSRET	MST50020
0036B8	F5F0 0000 213C	5003		CLAI	RETN, TST1.4	MST50030
0036BE	033F	5004		BER	RETN	MST50040
0036C0	E130 3DD4	5005		SVC	3, PBLK04	MST50050
0036C4	030F	5006		BR	RETN	MST50060
					AND OFFSET COMMAND TO D5	
					SECTOR NUMBER	
					SAVE RETURN	
					ALTCHAN NOT BUSY	
					=RESTORE OPERATION	
					RESTORE CMD TO DRIVE	
					WAIT FOR CONTROLLER IDLE	
					WAIT FOR DRIVE READY	
					SET CURRENT CYLINDER = 0	
					CURRENT CYLINDER ADRS	
					TESTING SEEK INCOMPLETE ?	
					BRANCH: YES.	
					TEST DRIVE STATUS = X'00'	
					RETURN.	



## TEST SEQUENCE SUPPORT ROUTINES

		5008	*	PERFORMS READ CHECK ON CURRENT CYLINDER, HEAD, SECTOR.		MST50080
		5009	*	NO OPERATION IF BYCKAD = 1.		MST50090
		5010	*	INPUT REGISTERS:		MST50100
		5011	*	FUT = DRIVE ADDRESS		MST50110
		5012	*	DCAD = CONTROLLER ADDRESS		MST50120
		5013	*	TRACK = CYLINDER ADDRESS		MST50130
		5014	*	SECT = SECTOR ADDRESS		MST50140
		5015	*	MEMORY LOCATIONS:		MST50150
		5016	*	HEAD = HEAD ADDRESS		MST50160
		5017	*	PACTYP = CE OR USER PACK IDENTIFIER		MST50170
		5018	*	REGISTERS DESTROYED: RO,WK0,WK1,STAT,OPKEY,RETN2		MST50180
		5019	*			MST50190
0036C6	4800 16E2	5020	CKADSR	LH RO,BYCKAD+6	BYPASS READ CHECK ?	MST50200
0036CA	023F	5021		BNZR RETN	BRANCH IF YES.	MST50210
0036CC	50F0 1924	5022	CKADSRX	STA RETN,RWSAVE		MST50220
0036D0	2400	5023		LIS RO,0		MST50230
0036D2	4000 18B8	5024		STH RO,RDER	RESET READ ERROR INDICATOR	MST50240
0036D6	41F0 3462	5025	CKRDX	BAL R15,FRSSR1	RETURN WHEN DRIVE READY	MST50250
0036DA	41F0 3438	5026		BAL R15,SETHEAD	WRITE HEAD NUMBER TO DRIVE	MST50260
0036DE	41F0 344C	5027		BAL R15,SETOFF	SERVO/STROBE OFFSET TO DRIVE	MST50270
0036E2	41F0 352C	5028		BAL R15,CHEDR	WRITE HEADER TO CONTROLLER	MST50280
0036E6	C8C0 0050	5029		LHI OPKEY,X'50'		MST50290
0036EA	40C0 18CC	5030		STH OPKEY,OPCODE	=READ-CHECK OPERATION	MST50300
0036EE	D300 189B	5031		LB RO,RCHECK		MST50310
0036F2	4000 18CA	5032		STH RO,RWOCHD		MST50320
0036F6	9E30	5033		OCR DCAD,RO	COMMAND READ-CHECK.	MST50330
0036F8	41E0 347C	5034		BAL R14,CWAIT	WAIT FOR CONTROLLER IDLE	MST50340
0036FC	0080	5035		DCX 0080		MST50350
0036FE	9B50	5036		RDR FUT,RO	GET RPS @ CTRLR IDLE	MST50360
003700	4000 18E4	5037		STH RO,RPSCNT	AND SAVE.	MST50370
003704	E120 3E08	5038		SVC 2,PBLK14	TO ERRCK AFTER ANY ERROR PRINT	MST50380
003708	4800 18B8	5039		LH RO,RDER	DID IT FAIL THE FIRST READ ?	MST50390
00370C	2333	5040		BZS CKTL1	BRANCH: NO.	MST50400
00370E	E150 1B12	5041		SVC 5,MSG23	SOFT READ ERROR	MST50410
003712	58F0 1924	5042	CKTL1	LDA RETN,RWSAVE		MST50420
003716	030F	5043		BR RETN		MST50430
003718	4800 18B8	5045	ERRCK	LH RO,RDER		MST50450
00371C	2334	5046		BZS ERRCK1		MST50460
00371E	E150 1B02	5047		SVC 5,MSG22	HARD READ ERROR	MST50470
003722	2208	5048		BS CKTL1	RETURN TO CALLER	MST50480
003724	4050 18B8	5049	ERRCK1	STH FUT,RDER	INDICATE SECOND READ CHECK	MST50490
003728	4300 36D6	5050		B CKRDX	CHECK WHETHER ERROR IS RECOVERABLE	MST50500
		5052	*	PSEUDO-RANDOM GENERATOR		MST50520
		5053	*	BAL RETN,RAND		MST50530
		5054	*	RETURNS RESULT IN WK0		MST50540
		5055	*			MST50550
00372C	4860 1PC2	5056	RAND	LH WK0,RND1	FIBONACCI	MST50560
003730	4870 18C4	5057		LH WK1,RND2	NUMBER	MST50570
003734	4070 18C2	5058		STH WK1,RND1	GENERATOR	MST50580
003738	0A67	5059		AAR WK0,WK1		MST50590



## TEST SEQUENCE SUPPORT ROUTINES

		5107	* ROUTINE MAINTAINS COUNTS FOR SCOPE LOOP TESTS		MST51070
		5108	* CALLING SEQUENCE: BAL R15,CNTDOWN		MST51080
		5109	* DAC (CONTINUATION ADRS)		MST51090
		5110	* REGISTERS DESTROYED: RO		MST51100
		5111	*		MST51110
0037AC	2501	5112	CNTDOWN LCS RO,1		MST51120
0037AE	6100 18E6	5113	AHM RO,COUNTER	DECREMENT COUNTER	MST51130
0037B2	4320 3D60	5114	BNP TESTAUT1	REFORMAT/EXIT.	MST51140
0037B6	26F3	5115	CONTINUE AIS R15,ADC-1	TO LOAD 'DAC' PARAMETER	MST51150
0037B8	C4F0 FFFC	5116	NHI R15,0-ADC	FORCE ALIGNMENT TO LOAD	MST51160
0037BC	58FF 0000	5117	LDA R15,0(R15)	CONTINUATION VECTOR	MST51170
0037C0	030F	5118	BR R15	CONTINUE	MST51180
		5120	* EVALUATES TRACK FOR USE IN FORMAT-MODE TESTING.		MST51200
		5121	* NO ALTERNATED SECTORS ARE ALLOWED. SECTOR '40' MUST NOT EXIST.		MST51210
		5122	* BAL RETN, TENSECT		MST51220
		5123	*		MST51230
0037C2	E600 383E	5124	TENSECT LDAI RO,GOCHECK2		MST51240
0037C6	5000 1934	5125	STA RO,BERN	REBUN ADRS	MST51250
0037CA	50F0 1948	5126	STA R15,TEMPC		MST51260
0037CE	C8D0 003F	5127	LHI SECT,MAXSEC-1	START WITH MAX VALID LOGICAL SECTOR	MST51270
0037D2	41F0 36CC	5128	TENS.1 BAL R15,CKADSRX	DO READ-CHECK	MST51280
0037D6	27D1	5129	SIS SECT,1		MST51290
0037D8	2213	5130	BWMS TENS.1		MST51300
		5131	*		MST51310
0037DA	2405	5132	LIS RO,X'0005'	FORMAT READ CHD, ONLY	MST51320
0037DC	4000 1896	5133	STH RO,WCMD		MST51330
0037E0	2501	5134	LCS RO,1		MST51340
0037E2	5000 193C	5135	STA RO,ERRFLG	UNCONDITIONAL RETURN	MST51350
0037E6	C8C0 0071	5136	LHI OPKEY,X'71'		MST51360
0037EA	40C0 18CC	5137	STH OPKEY,OPCODE	=READ-FORMAT OPERATION	MST51370
0037EE	41F0 314C	5138	BAL R15,FMSUDF	SET UP GAP, SYNC BYTES	MST51380
0037F2	2403	5139	LIS RO,3		MST51390
0037F4	5000 1900	5140	STA RO,SIZE	SET TO READ SECTOR HEADER	MST51400
0037F8	24C0	5141	LIS SECT,0		MST51410
0037FA	41F0 32FA	5142	GOCHECK BAL R15,READX	READ DATA FROM PHYSICAL SECTOR	MST51420
0037FE	41F0 3510	5143	BAL R15,HEADER	SET UP PROPER HEADER IMAGE	MST51430
003802	41F0 3292	5144	BAL R15,TDATA	AND CHECK AGAINST THAT READ.	MST51440
003806	26D1	5145	AIS SECT,1		MST51450
003808	C5C0 0040	5146	CLHI SECT,MAXSEC	TRACK DONE ?	MST51460
00380C	2089	5147	BLS GOCHECK		MST51470
		5148	*		MST51480
00380E	2501	5149	LCS RO,1		MST51490
003810	5000 193C	5150	STA RO,ERRFLG	UNCONDITIONAL RETURN	MST51500
003814	41F0 32FA	5151	BAL R15,READX	CHECK THAT SECTOR '40' NOT PRESENT	MST51510
003818	41F0 3510	5152	BAL R15,HEADER	SET UP SECTOR X'40' HEADER IMAGE	MST51520
00381C	5820 190C	5153	LDA R2,RDFADR		MST51530
003820	D361 0002	5154	LB WK0,2(R1)	HEADER BYTE 3 IMAGE	MST51540
003824	D372 0002	5155	LB WK1,2(R2)	HEADER BYTE 2 READ	MST51550
003828	0767	5156	XAR WK0,WK1		MST51560
00382A	4761 0000	5157	XH WK0,0(R1)	HEADER BYTES 1 & 2 IMAGE	MST51570
00382E	4762 0000	5158	XH WK0,0(R2)	HEADER BYTES 1 & 2 READ	MST51580

## TEST SEQUENCE SUPPORT ROUTINES

003832	2334	5159	BZS	GOCHECK1	BRANCH: HEADER EXISTS.	MST51590
003834	58FC 1948	5160	LDA	R15,TEMPC		MST51600
003838	03CF	5161	BR	R15		MST51610
00383A	E1E0 18E8	5163	JOCHECK1	SVC 5,MS335	'ALTERNATE SECTOR ASSIGNED'	MST51630
00383E	E1E0 184A	5164	GOCHECK2	SVC 5,MS325	'SELECT NEW SECTOR OPTION'	MST51640
003842	43C0 3D32	5165	B	EURC	EXIT TEST	MST51650
		5167	*	SUBROUTINE READS AND CHECKS SELCH TRANSFER END ADDRESS.		MST51670
		5168	*			MST51680
003846	41E0 3A58	5169	SLQHK	BAL R15,GETFA	GET SELCH FINAL ADDRESS	MST51690
00384A	58C0 1908	5170	LDA	RO,EXSELAD	RELOAD ADRS READ FROM SELCH	MST51700
00384E	55C0 1918	5171	CLA	RO,FA	AS EXPECTED ?	MST51710
003852	033E	5172	BER	RETN2		MST51720
003854	E1E0 0000	5173	SVC	6,0(RETN2)	SELCH FINAL ADRS WRONG	MST51730
		5174	*		(NO RETURN)	MST51740
		5176	*	SUBROUTINE READS END ADDRESS FROM SELECTOR CHANNEL		MST51760
		5177	*			MST51770
003858	4840 16EE	5178	GETFA	LH SLAD,SELCH+6	LOAD SELCH ADDRESS	MST51780
		5185	ELSE			MST51850
00385C	DE40 18A4	5186	OC	SLAD,ESTOP	32-BIT PROCESSOR	MST51860
003860	F5F0 0000 3984	5187	CLAI	R15,SVC.DRV	WILL NEST SVC'S ?	MST51870
003866	2383	5188	BNLS	GTFA2	DON'T ALLOW IT.	MST51880
003868	E110 3DC8	5189	SVC	1,PBLK01	TEST SELCH NOT BUSY	MST51890
00386C	DB40 1909	5190	GTFA2	RD SLAD,EXSELAD+1		MST51900
003870	D940 190A	5191	RH	SLAD,EXSELAD+2		MST51910
003874		5192	ENDC			MST51920
003874	5810 193C	5193	LDA	R1,ERRFLG	PARAM BLK ADRS	MST51930
003878	2116	5194	BMS	GTFA2A	BRANCH: ASSUME UNCONDX RETURN	MST51940
00387A	D301 0001	5195	LB	RO,1(R1)	LOAD REQ'D STATUS IMAGE	MST51950
00387E	C300 00F5	5196	THI	RO,X'F5'	ERROR-FREE XFER EXPECTED ?	MST51960
003882	2335	5197	BZS	GTFA3	BRANCH: YES	MST51970
003884	58C0 1908	5198	GTFA2A	LDA RO,EXSELAD	NO XFER EXPECTED;	MST51980
003888	50C0 1918	5199	STA	RO,FA	ADJUST FOR PROPER PRINTOUT.	MST51990
00388C	03CF	5200	GTFA3	BR R15	RETURN	MST52000
		5202	*	ROUTINE SETS UP SELCH FOR DATA TRANSFER.		MST52020
		5203	*			MST52030
00388E	D300 18A7	5204	SLCH	LB RO,SLCHCMD	SELCH COMMAND USED	MST52040
003892	5810 190C	5205	LDA	R1,RDFADR	READ BUFFER POINTER	MST52050
003896	C3C0 0020	5206	THI	RO,X'20'	SELCH TO READ ?	MST52060
00389A	2133	5207	BNZS	SL.1	BRANCH: YES.	MST52070
00389C	5810 1910	5208	LDA	R1,WTFADR	WRITE BUFFER POINTER	MST52080
0038A0	5010 1914	5209	SL.1	STA R1,SA		MST52090
0038A4	5A10 1900	5210	AA	R1,SIZE		MST52100
0038A8	4280 1D74	5211	BC	ERROR12	MEMORY LIMIT EXCEEDED (16 BIT)	MST52110
0038AC	5510 18FC	5212	CLA	R1,MEMTOP	ABOVE TOP OF MEMORY ?	MST52120

## TEST SEQUENCE SUPPORT ROUTINES

0038B0	4380 1D74	5213	BNL	ERROR12	BRANCH: YES. ABORT.	MST52130
0038B4	5010 1918	5214	STA	R1,FA	SELCH BUFFER END ADRS	MST52140
		5219	ELSE			MST52190
0038B8	DE40 18A4	5220	OC	SLAD,ESTOP	STOP SELCH	MST52200
0038BC	DA40 1915	5221	WD	SLAD,SA+1		MST52210
0038C0	D840 1916	5222	WH	SLAD,SA+2		MST52220
0038C4	DA40 1919	5223	WD	SLAD,FA+1		MST52230
0038C8	D840 191A	5224	WH	SLAD,FA+2		MST52240
0038CC		5225	ENDC			MST52250
0038CC	030F	5226	BR	R15	RETURN.	MST52260
		5228	* ROUTINE ADJUSTS INTERRUPT VECTORS			MST52280
		5229	*			MST52290
0038CE	481E 0000	5230	INSERT	LH R1,0(R14)	WHERE TO GET ADRS	MST52300
0038D2	4801 0000	5231		LH R0,0(R1)	LOAD ADRS	MST52310
0038D6	241A	5232		LIS R1,10		MST52320
0038D8	4501 17F4	5233	INS.1	CLH R0,DEVSADR(R1)		MST52330
0038DC	2333	5234		BES INS.2	MATCH.	MST52340
0038DE	2712	5235		SIS R1,2		MST52350
0038E0	2204	5236		BS INS.1		MST52360
0038E2	480E 0002	5237	INS.2	LH R0,2(R14)		MST52370
0038E6	4001 1802	5238		STH R0,DEVINT(R1)	NEW VECTOR	MST52380
0038EA	430E 0004	5239		B 4(R14)	RETURN	MST52390
		5241	* ROUTINE PRODUCES MEMORY CONTENTION WHILE SELCH IS ACTIVE.			MST52410
		5242	*			MST52420
		5243	BACKGRND	EQU *		MST52430
0038EE	0000 38EE	5244		NOP *	USER LINKS IN HERE,	MST52440
0038F2	0200	5245		NOPR		MST52450
0038F4	D000 3E60	5246		STM R0,RSAVE		MST52460
0038F8	55F0 3E9C	5247		CLA R15,ADC*15+RSAVE		MST52470
0038FC	213D	5248		BNES BCK.1		MST52480
0038FE	D2E0 0000	5249		STB SECT,0	INITIALIZE FOR TEST&SET	MST52490
003902	D4E0 0000	5250		CLB SECT,0		MST52500
003906	2138	5251		BNES BCK.1		MST52510
003908		5252		IFZ ADC-4		MST52520
003908	E000 0000	5253		TS 0	TEST-AND-SET FOR CONTENTION	MST52530
00390C	2115	5254		BMS BCK.1		MST52540
00390E	E0C0 0000	5255		TS 0		MST52550
003912	2312	5256		BNMS BCK.1		MST52560
003914		5257		ENDC		MST52570
003914	03C2	5258		BR R2	RETURN.	MST52580
		5259	*			MST52590
003916	DE40 18A3	5260	BCK.1	OC SLAD,STOP	STOP SELCH	MST52600
00391A	E190 3E14	5261		SVC 9,PBLK20	BACKGROUND FAILURE.	MST52610
00391E	03G2	5262		BR R2	MAY RETURN...	MST52620

## ERROR HANDLER

			5264	*	*****				MST5264C
			5265	*					MST52650
			5266	*					MST52660
			5267	*	E R R O R	H A N D L E R			MST52670
			5268	*					MST52680
			5269	*					MST52690
			5270	*	SVC.DRV IS THE COMMON STATUS-TEST ROUTINE USED BY ALL TEST MODULES.				MST52700
			5271	*	ENTRY TO THIS ROUTINE IS MADE BY AN 'SVC N,PARBLK' INSTRUCTION,				MST52710
			5272	*					MST52720
			5273	*	FOR SVC'S 0, 1, 2, 3:				MST5273C
			5274	*	DEVICE STATUS IS 'ANDED' WITH A MASK, AND THE RESULT IS COMPARED				MST52740
			5275	*	WITH THE REQUIRED STATUS IMAGE. COMPARE FAILURE NORMALLY CAUSES				MST52750
			5276	*	AN ERROR MESSAGE TO BE PRINTED. FOLLOWING AN ERROR, CONTROL MAY				MST52760
			5277	*	OPTIONALLY BE PASSED TO A TRANSFER LOCATION, AND ERROR PRINTOUT				MST52770
			5278	*	MAY OPTIONALLY BE DEFINED AS SUPPRESSED.				MST52780
			5279	*					MST52790
			5280	*	ON TERMINATION OF THE STATUS TEST, CONTROL IS PASSED TO THE				MST52800
			5281	*	INSTRUCTION FOLLOWING THE SUPERVISOR CALL (SVC), UNLESS AN ERROR				MST52810
			5282	*	IS DETECTED. DATA IS DESTROYED IN REGISTERS R0, R1 AND				MST52820
			5283	*	STAT, WHEN THIS ROUTINE IS EXECUTED ON A 16-BIT PROCESSOR.				MST52830
			5284	*					MST52840
			5285	*					MST52850
003920	D3A0	159A	5286	SVC0.OP	LB	STAT,INTSTA	LAST-INTERRUPTING-DEVICE STATUS TEST		MST52860
003924	4800	1598	5287		LH	R0,INTDEV	INTERRUPTING DEVICE		MST52870
003928	2410		5288		LIS	R1,0	SET ENTRY CODE		MST52880
00392A	4300	3984	5289		B	SVC.DRV	ENTER COMMON HANDLER		MST52890
00392E	4800	16EE	5291	SVC1.OP	LH	R0,SELCH+6	SELECTOR CHANNEL STATUS TEST		MST52910
003932	9D0A		5292		SSR	R0,STAT			MST52920
003934	2411		5293		LIS	R1,1			MST52930
003936	4300	3984	5294		B	SVC.DRV			MST52940
00393A	4800	16FA	5296	SVC2.OP	LH	R0,DISCOM+6	DISC CONTROLLER STATUS TEST		MST52960
00393E	9D0A		5297		SSR	R0,STAT			MST52970
003940	2412		5298		LIS	R1,2			MST52980
003942	4300	3984	5299		B	SVC.DRV			MST52990
003946	4800	18C6	5301	SVC3.OP	LH	R0,STATE	CURRENT DRIVE STATUS TEST		MST53010
00394A	9D0A		5302		SSR	R0,STAT			MST53020
00394C	2413		5303		LIS	R1,3			MST53030
00394E	4300	3984	5304		B	SVC.DRV			MST53040
003952	4800	1598	5306	SVC4.OP	LH	R0,ERRDEV	TIMEOUT ERROR		MST53060
003956	9D0A		5307		SSR	R0,STAT			MST53070
003958	2414		5308		LIS	R1,4			MST53080
00395A	4300	3984	5309		B	SVC.DRV			MST53090
00395E	2415		5311	SVC5.OP	LIS	R1,5	TEXT MESSAGE, ONLY		MST53110
003960	4300	3984	5312		B	SVC.DRV			MST53120
003964	2416		5314	SVC6.OP	LIS	R1,6	SELCH FINAL ADDRESS ERROR		MST53140
003966	4800	16EE	5315		LH	R0,SELCH+6			MST53150
00396A	9D0A		5316		SSR	R0,STAT			MST53160
00396C	230C		5317		BS	SVC.DRV			MST53170

## ERROR HANDLER

00396E	2417		5319	SVC7.OP	LIS	R1,7	DATA COMPARE ERROR	MST53190
003970	4800	1598	5320		LH	R0,ERRDEV		MST53200
003974	9DOA		5321		SSR	R0,STAT		MST53210
003976	2307		5322		BS	SVC.DRV		MST53220
003978	2418		5324	SVC8.OP	LIS	R1,8	RPS ERROR	MST53240
00397A	4800	18C6	5325		LH	R0,STATE	CURRENT DRIVE ADDRESS	MST53250
00397E	9DOA		5326		SSR	R0,STAT		MST53260
003980	2302		5327		BS	SVC.DRV		MST53270
003982	2419		5329	SVC9.OP	LIS	R1,9	BACKGROUND TESTING FAILURE	MST53290
	0000	3984	5331	SVC.DRV	EQU	*	COMMON STATUS TEST DRIVER	MST53310
003984	4010	18D8	5332		STH	R1,SVCNUM	SAVE CALLING SVC NUMBER	MST53320
003988	4000	1598	5333		STH	R0,ERRDEV	DEVICE IN ERROR	MST53330
			5338		ELSE			MST53380
00398C	DOEO	18FO	5339		STH	R14,SVCPSW	SAVE 32-BIT USER'S RETURN PSW	MST53390
003990	081D		5340		LDAR	R1,R13	COPY PARAM BLK ADRS	MST53400
003992	082F		5341		LDAR	R2,R15	GET OLD LOC	MST53410
003994			5342		ENDC			MST53420
003994	5010	18F8	5343		STA	R1,BLKADRS	AND SAVE.	MST53430
003998	2724		5344		SIS	R2,4	TO POINT TO 'SVC' INSTRUCTION -	MST53440
00399A	4020	1596	5345		STH	R2,OLOC	FOR ERROR MESSAGE	MST53450
00399E	D2A0	159A	5346		STB	STAT,ERRSTA	SAVE ERROR STATUS	MST53460
0039A2	4800	16EE	5347		LH	R0,SELCH+6		MST53470
0039A6	DD00	194C	5348		SS	R0,STATTAB	GET SELCH STATUS FOR SEQ3.	MST53480
			5349	*				MST53490
0039AA	2400		5350		LIS	R0,0		MST53500
0039AC	4000	18BE	5351		STH	R0,ERRFLG1	RESET 'ERROR DETECTED' FLAG	MST53510
0039B0	2411		5352		LIS	R1,1	SHIFT COUNTER	MST53520
0039B2	4820	18D8	5353	DRV.1	LH	R2,SVCNUM	GET CALLING CODE	MST53530
0039B6	1121		5354		SLLS	R2,1		MST53540
0039B8	4802	3D8A	5355		LH	R0,SEQTAB(R2)	GET SEQUENCE CONTROL INFO	MST53550
0039BC	CD01	0000	5356		SLHL	R0,0(R1)	TEST BIT N	MST53560
0039C0	2185		5357		BCS	DRV.3		MST53570
0039C2	4330	39F8	5358		BZ	SEQEXIT	BRANCH: NO MORE TO DO.	MST53580
0039C6	2611		5359	DRV.2	AIS	R1,1	INCREMENT SHIFT COUNT	MST53590
0039C8	220B		5360		BS	DRV.1	AND TRY AGAIN	MST53600
0039CA	C800	2020	5361	DRV.3	LHI	R0,C'		MST53610
0039CE	4000	1AA0	5362		STH	R0,MSG17+12		MST53620
0039D2	4000	1AA2	5363		STH	R0,MSG17+14	INITIALIZE BUFFER	MST53630
0039D6	E6C0	10E8	5364		LDAI	R12,HEXASC	(GLOBAL REGISTER)	MST53640
0039DA	4010	18DA	5365		STH	R1,SEQPTR	SAVE FOR NEXT ARGUMENTS	MST53650
0039DE	1112		5366		SLLS	R1,LADC		MST53660
0039E0	58C1	3D9C	5367		LDA	R0,SEQVECTS-ADC(R1)	GET HANDLER VECTOR	MST53670
0039E4	01D0		5368		BALR	R13,R0	AND GO TO IT.	MST53680
0039E6	41F0	1110	5369	NEXTSQ	BAL	R15,PRINT	PRINT THE LINE.	MST53690
0039EA	2400		5370	NXTSQ.1	LIS	R0,0		MST53700
0039EC	40C0	15BC	5371		STH	R0,ISITERR		MST53710
0039F0	4810	18DA	5372		LH	R1,SEQPTR		MST53720
0039F4	4300	39C6	5373		B	DRV.2	CONTINUE...	MST53730

## ERROR HANDLER

0039F8	4810 18BE	5374 *					MST53740
0039FC	4230 3092	5375	SEQEXIT	LH	R1,ERRFLG1	WAS ERROR DETECTED ?	MST53750
	0000 3A00	5376		BNZ	ISOLID	CHECK ABORT	MST53760
003A00	41F0 366E	5377	COMPRETN	EQJ	*	EXIT FROM ERROR CHECK ROUTINE	MST53770
003A04	4800 150A	5378		BAL	LINK,DISPLAY	SHOW CYL, SECT, HEAD.	MST53780
003A08	C500 0017	5379		LH	R0,ETESTNO		MST53790
003A0C	2333	5380		CLHI	R0,X'17'	RUNNING PE-FORMAT TEST ?	MST53800
003A0E	41F0 1274	5381		COMR.1	COMR.1	BRANCH: YES, IGNORE BRK.	MST53810
003A12	2400	5382		BAL	R15,TSTBRK	CHECK BREAK KEY	MST53820
003A14	4000 15BC	5383	COMR.1	LIS	R0,0		MST53830
		5384		STH	R0,ISITERR		MST53840
		5388		ELSE			MST53880
003A18	C200 18FD	5389		LPSW	SVCPSW	32-BIT RETURN	MST53890
003A1C		5390		ENDC			MST53900
	0000 3A1C	5392	SEQ0	EQJ	*	TESTS DEVICE STATUS, DRIVE RPS	MST53920
003A1C	4800 18D8	5393		LH	R0,SVCNUM		MST53930
003A20	C500 0008	5394		CLHI	R0,8	TESTING RPS ?	MST53940
003A24	213E	5395		BNES	SEQ0.1	BRANCH: NO.	MST53950
003A26	4810 18E4	5396		LH	R1,RPSCNT	ACTUAL RPS COUNT	MST53960
003A2A	4510 18CE	5397		CLH	R1,ERPSCNT	EXPECTED RPS COUNT	MST53970
003A2E	4330 3A00	5398		BE	COMRETN	BRANCH: AS EXPECTED.	MST53980
003A32	4000 18BE	5399		STH	R0,ERRFLG1	SET ERROR FLAG	MST53990
003A36	4300 39EA	5400		B	NXTSQ.1		MST54000
		5401	*				MST54010
003A3A	5810 18F3	5402	SEQ0.1	LDA	R1,BLKADRS	GET PBLK ADDRESS	MST54020
003A3E	D321 0000	5403		LB	R2,0(R1)	GET STATUS MASK	MST54030
003A42	042A	5404		NAR	R2,STAT	MASK OFF UNTESTED BITS	MST54040
003A44	D421 0001	5405		CLB	R2,1(R1)	AND COMPARE WITH REQUIRED IMAGE.	MST54050
003A48	4330 3A00	5406		BE	COMRETN	BRANCH: NO ERROR.	MST54060
003A4C	25C1	5407		LCS	R0,1		MST54070
003A4E	4000 18BE	5408		STH	R0,ERRFLG1	SET 'SVC ERROR' FLAG	MST54080
003A52	4821 0002	5409		LH	R2,2(R1)	GET TRANSFER PARAMETER	MST54090
003A56	4210 3D10	5410		BM	XFER	BRANCH: IMMEDIATE VECTOR.	MST54100
003A5A	4300 39EA	5411		B	NXTSQ.1		MST54110
	0000 3A5E	5413	SEQ1	EQJ	*	PRINTS 'ERROR...','LOC...'	MST54130
003A5E	2401	5414		LIS	R0,1		MST54140
003A60	6100 15C8	5415		AHM	R0,TOTERR	INCREMENT ETPE ERROR COUNTER	MST54150
003A64	2501	5416		LCS	R0,1		MST54160
003A66	4000 18BE	5417		STH	R0,ERRFLG1	SET SVC.DRV ERROR FLAG	MST54170
003A6A	6100 18C8	5418		AHM	R0,RRCTR	DECREMENT RETRIES REMAINING	MST54180
003A6E	41F0 366E	5419		BAL	LINK,DISPLAY		MST54190
003A72	4810 1504	5420		LH	R1,ETESTNO	GET TEST NUMBER	MST54200
003A76	4010 15BC	5421		STH	R1,ISITERR	FORCE MESSAGE PRINT	MST54210
003A7A	4010 15BE	5422		STH	R1,NOERP	SUPPRESS THIS PRINT	MST54220
003A7E	4010 1BA3	5423		STH	R1,MSG31+6		MST54230
003A82	41F0 11B0	5424		BAL	R15,CRLF		MST54240
003A86	2420	5425		LIS	R2,0		MST54250
003A88	4800 18D3	5426		LH	R0,SVCNUM	SVC CODE	MST54260





## ERROR HANDLER

003B24	4000 1598	5479	STH	R0,ERRDEV		MST54790
003B28	DD00 159A	5480	SS	R0,ERRSTA		MST54800
003B2C	41E0 0FFE	5481	BAL	R14,ERRDS1	'DEV DDD STA SS'	MST54810
003B30	43C0 39EA	5482	B	MXISQ.1		MST54820
	0000 3B34	5484	SEQ3	EQU	*	PRINTS ALL DEVICE STATUSES
003B34	2412	5485		LIS	R1,2	GET ALL DEVICE STATUSES
003B36	2421	5486		LIS	R2,1	
003B38	48C1 17F4	5487	SEQ3.0	LH	R0,DEVSADR(R1)	GET DEVICE ADDRESS
003B3C	DD02 194C	5488		SS	R0,STATTAB(R2)	PUT STATUS IN TABLE
003B40	2612	5489		AIS	R1,2	
003B42	2621	5490		AIS	R2,1	
003B44	C520 0006	5491		CLHI	R2,6	
003B48	2088	5492		BLS	SEQ3.0	FOR ALL DEVICES IN TABLE.
003B4A	2430	5493		LIS	R3,0	TABLE INDEX
003B4C	4030 15BC	5494		STH	R3,ISITERR	LEVEL 0 SUPPRESSION
003B50	E620 186A	5495		LDAI	R2,MSG27+7	DESTINATION
003B54	2402	5496		LIS	R0,2	BYTE COUNT
003B56	D313 194C	5497	SEQ3.1	LB	R1,STATTAB(R3)	STATUS (HEX)
003B5A	01FC	5498		BALR	R15,R12	TO HEXASC
003B5C	C810 0020	5499		LHI	R1,C' '	
003B60	D212 0002	5500		STB	R1,2(R2)	
003B64	2623	5501		AIS	R2,3	
003B66	2631	5502		AIS	R3,1	
003B68	C530 0006	5503		CLHI	R3,6	
003B6C	208B	5504		BLS	SEQ3.1	
003B6E	241D	5505		LIS	R1,X'0D'	CARRIAGE RETURN
003B70	D212 0000	5506		STB	R1,0(R2)	AT END OF MESSAGE
003B74	E650 1863	5507		LDAI	R5,MSG27	
003B78	030D	5508		BR	R13	'STATUS S1,S2.....'
	0000 3B7A	5510	SEQ4	EQU	*	PRINTS CYLINDER, HEAD, SECTOR
003B7A	5810 1908	5511		LDA	R1,BCOUNT	GET TDATA BYTE COUNT
003B7E	4800 18CC	5512		LH	R0,OPCODE	
003B82	C500 0080	5513		CLHI	R0,X'80'	SOFTWARE BYTE COUNT TO BE USED ?
003B86	2337	5514		BES	SEQ4.0	BRANCH: YES.
003B88	41F0 3858	5515		BAL	R15,GETFA	READ SELCH FINAL ADDRESS
003B8C	5810 1908	5516		LDA	R1,EXSELAD	ADDRESS READ FROM SELCH
003B90	5B10 1914	5517		SA	R1,SA	LESS START ADRS = LENGTH AT ERROR
003B94	C820 0114	5518	SEQ4.0	LHI	R2,PRECL	
003B98	4800 18CA	5519		LH	R0,RWOCMD	OUTPUT COMMAND TO CTRLR
003B9C	1003	5520		SRLS	R0,X'03'	FORMAT MODE ?
003B9E	2183	5521		BCS	SEQ4.1	BRANCH: YES
003BA0	C820 0100	5522		LHI	R2,LRECL	NORMAL-MODE BYTE COUNT
003BA4	4800 18DC	5523	SEQ4.1	LH	R0,CURSECT	GET STARTING SECTOR
003BA8	0B12	5524	SEQ4.2	SAR	R1,R2	SUBTRACT BYTES/SECTOR
003BAA	2113	5525		BMS	SEQ4.3	BRANCH: DONE.
003BAC	2601	5526		AIS	R0,1	INCREMENT SECTOR COUNT
003BAE	2203	5527		BS	SEQ4.2	
003BB0	C840 0040	5528	SEQ4.3	LHI	R4,MAXSEC	ASSUMING 64 SECTORS/TRACK

## ERROR HANDLER

003BB4	4850	18E0	5529	LH	R5,HEAD	GET STARTING HEAD	MST55290
003BB8	2434		5530	LIS	R3,4		MST55300
003BBA	4430	18CA	5531	NH	R3,RWOCMD	EXTRACT 'FORMAT' BIT	MST55310
003BBE	4430	18BA	5532	NH	R3,FLAGS	TRULY 65 SECTORS/TRACK ?	MST55320
003BC2	2332		5533	BZS	SEQ4.4	BRANCH: NO.	MST55330
003BC4	2641		5534	AIS	R4,1	65 SECTORS.	MST55340
003BC6	0504		5535	SEQ4.4 CLAR	RO,R4	PASSED HEAD BOUNDARY ?	MST55350
003BC8	2184		5536	BLS	SEQ4.5	BRANCH: NO.	MST55360
003BCA	0804		5537	SAR	RO,R4	ADJUST SECTOR NUMBER,	MST55370
003BCC	2651		5538	AIS	R5,1	ADVANCE HEAD NUMBER.	MST55380
003BCE	2204		5539	BS	SEQ4.4	CHECK FOR LARGE XFERS.	MST55390
			5540	*			MST55400
003BD0	0810		5541	SEQ4.5 LDAR	R1,R0	COPY SECTOR NUMBER	MST55410
003BD2	2402		5542	LIS	RO,2	BYTE COUNT	MST55420
003BD4	4000	15BC	5543	STH	RO,ISITERR	LEVEL 2 PRINT SUPPRESSION	MST55430
003BD8	E620	1ABB	5544	LDAI	R2,MSG18+21	DESTINATION	MST55440
003BDC	01FC		5545	BALR	R15,R12	CONVERT LOGICAL SECTOR NUMBER	MST55450
003BDE	0815		5546	LDAR	R1,R5	COPY HEAD NUMBER	MST55460
003BE0	E620	1AB3	5547	LDAI	R2,MSG18+13	DESTINATION	MST55470
003BE4	01FC		5548	BALR	R15,R12	CONVERT HEAD NUMBER	MST55480
003BE6	4810	18E2	5549	LH	R1,CURCYL		MST55490
003BEA	2403		5550	LIS	RO,3		MST55500
003BEC	E620	1AAA	5551	LDAI	R2,MSG18+4		MST55510
003BF0	01FC		5552	BALR	R15,R12	CONVERT CYLINDER ADDRESS	MST55520
003BF2	E650	1AA6	5553	LDAI	R5,MSG18		MST55530
003BF6	030D		5554	BR	R13	'CYL CCC HEAD NN.....'	MST55540
			5556	SEQ5 EQU	*	LOGS COMMENTARY MESSAGE VIA SVC	MST55560
003BF8	5850	18F8	5557	LDA	R5,BLKADRS	MESSAGE ADDRESS	MST55570
003BFC	4050	15BC	5558	STH	R5,ISITERR	FORCE PRINT	MST55580
003C00	030D		5559	BR	R13	LOG MESSAGE	MST55590
			5561	SEQ6 EQU	*	PRINTS SELCH FINAL ADRS ERROR	MST55610
003C02	41F0	3858	5562	BAL	R15,GETFA	GET SELCH FINAL ADDRESS	MST55620
003C06	24C1		5563	LIS	RO,1		MST55630
003C08	4000	15BC	5564	STH	RO,ISITERR	LEVEL 1 PRINT SUPPRESSION	MST55640
003C0C	5810	1908	5565	LDA	R1,EXSELAD	RELOAD SELCH FINAL ADDRESS	MST55650
003C10	2406		5566	LIS	RO,ADC+2	DIGIT COUNT	MST55660
003C12	E620	1A8C	5567	LDAI	R2,MSG16+9	DESTINATION	MST55670
003C16	01FC		5568	BALR	R15,R12	CONVERT EXPECTED FA	MST55680
003C18	E650	1A83	5569	LDAI	R5,MSG16		MST55690
003C1C	41F0	1110	5570	BAL	R15,PRINT	'SELCH FA.....'	MST55700
003C20	5810	1918	5571	LDA	R1,FA	EXPECTED END ADRS	MST55710
003C24	E620	1A9E	5572	LDAI	R2,MSG17+10	DESTINATION	MST55720
003C28	01FC		5573	BALR	R15,R12		MST55730
003C2A	E650	1A94	5574	LDAI	R5,MSG17		MST55740
003C2E	030D		5575	BR	R13	'SHOULD BE.....'	MST55750

## ERROR HANDLER

	0000	3C30	5577	SEQ7	EQU	*	PRINTS DATA COMPARE ERROR	MST55770
003C30	5810	1908	5578		LDA	R1,BCOUNT	BYTE COUNT AT DATA COMPARE ERROR	MST55780
003C34	2406		5579		LIS	RO,ADC+2		MST55790
003C36	E620	1A72	5580		LDAI	R2,MSG15+6	DESTINATION	MST55800
003C3A	01FC		5581		BALR	R15,R12	CONVERT BYTE COUNT	MST55810
003C3C	2404		5582		LIS	RO,4	BYTE COUNT	MST55820
003C3E	4810	18D0	5583		LH	R1,EDATA	EXPECTED DATA	MST55830
003C42	E620	1A9E	5584		LDAI	R2,MSG17+10		MST55840
003C46	01FC		5585		BALR	R15,R12	CONVERT GOOD DATA	MST55850
003C48	4810	18D2	5586		LH	R1,RDATA	DATA READ	MST55860
003C4C	E620	1A7E	5587		LDAI	R2,MSG15+18		MST55870
003C50	01FC		5588		BALR	R15,R12	CONVERT BAD DATA	MST55880
003C52	E650	1A6C	5589		LDAI	R5,MSG15		MST55890
003C56	41F0	1110	5590		BAL	R15,PRINT	'BYTES .... READ ....'	MST55900
003C5A	E650	1A94	5591		LDAI	R5,MSG17		MST55910
003C5E	03CD		5592		BR	R13	'SHOULD BE...'	MST55920
	0000	3C60	5594	SEQ8	EQU	*	CHECKS AND PRINTS RPS ERROR, IF ANY	MST55940
003C60	2402		5595		LIS	RO,2	BYTE COUNT	MST55950
003C62	4000	15BC	5596		STH	RO,ISITERR	LEVEL 2 SUPPRESSION	MST55960
003C66	4810	18E4	5597		LH	R1,RPSCNT	ACTUAL RPS COUNT @ CTRLR IDLE	MST55970
003C6A	E620	1B9F	5598		LDAI	R2,MSG30+5		MST55980
003C6E	01FC		5599		BALR	R15,R12	CONVERT CURRENT RPS COUNT	MST55990
003C70	E620	1A9E	5600		LDAI	R2,MSG17+10		MST56000
003C74	4810	18CE	5601		LH	R1,ERPSCNT	LOAD EXPECTED RPS COUNT	MST56010
003C78	01FC		5602		BALR	R15,R12	CONVERT EXPECTED COUNT	MST56020
003C7A	E650	1B9A	5603		LDAI	R5,MSG30		MST56030
003C7E	41F0	1110	5604		BAL	R15,PRINT	'RPS...'	MST56040
003C82	E650	1A94	5605		LDAI	R5,MSG17		MST56050
003C86	030D		5606		BR	R13	'SHOULD BE....'	MST56060
	0000	3C88	5608	SEQ9	EQU	*	PRINTS BKGRND FAILURE MESSAGE	MST56080
003C88	E650	1BC4	5609		LDAI	R5,MSG33		MST56090
003C8C	4050	15BC	5610		STH	R5,ISITERR	FORCE PRINT	MST56100
003C90	030D		5611		BR	R13	'BACKGROUND FAILURE'	MST56110
	0000	3C92	5613	TSOLID	EQU	*	DECIDES IF TO ABORT TEST ON ERROR	MST56130
003C92	4800	171E	5614		LH	RO,RETRY+6		MST56140
003C96	4330	3D32	5615		BZ	EURC	ALWAYS ABORT ON 'NO RETRYS'	MST56150
003C9A	4800	18BA	5616		LH	RO,FLAGS	LOAD MODULE FLAGS	MST56160
003C9E	1002		5617		SRLS	RO,X'02'	'DO NOT ABORT' ?	MST56170
003CA0	2185		5618		BCS	RERUN	BRANCH: YES.	MST56180
003CA2	4800	18C8	5619		LH	RO,RRCTR		MST56190
003CA6	4210	3D32	5620		BM	EURC	ABORT ON (RETRY) ERRORS.	MST56200
	0000	3CAA	5622	RERUN	EQU	*	ATTEMPTS ERROR RECOVERY	MST56220

## ERROR HANDLER

003CAA	48E0	18E2	5623	LH	TRACK,CURCYL		MST56230
003CAE	4840	16EE	5624	LH	SLAD,SELCH+6		MST56240
003CB2	DE40	18A3	5625	OC	SLAD,STOP	STOP SELCH	MST56250
003CB6	4830	16FA	5626	LH	DCAD,DISCON+6		MST56260
003CBA	DE30	189E	5627	CC	DCAD,RESET	RESET CONTROLLER	MST56270
003CBE	2400		5628	LIS	RO,0		MST56280
003CC0	4850	18C6	5629	LH	FUT,STATE		MST56290
003CC4	9850		5630	WHR	FUT,RO		MST56300
003CC6	DE50	1899	5631	OC	FUT,HEDCMD	SET HEAD 0	MST56310
003CCA	240F		5632	LIS	RO,15		MST56320
003CCC	41F0	10A4	5633	BAL	R15,TIMER	UNCONDY WAIT 15 MSEC.	MST56330
003CD0	DE50	189D	5634	OC	FUT,CLEAR	CLEAR FAULT	MST56340
003CD4	41F0	10A4	5635	BAL	R15,TIMER	UNCONDY WAIT 15 MSEC.	MST56350
003CD8	9D5A		5636	SSR	FUT,STAT		MST56360
003CDA	4320	3D04	5637	BFC	SEEKINC,RER1	BRANCH: NO RESTORE NECESSARY.	MST56370
003CDE	DE50	18A0	5638	OC	FUT,RESTOC	RESTORE.	MST56380
003CE2	C800	06D6	5639	LHI	RO,1750		MST56390
003CE6	41F0	10A4	5640	BAL	R15,TIMER	UNCONDY WAIT 1750 MSEC.	MST56400
003CEA	D850	18E2	5641	WH	FUT,CURCYL		MST56410
003CEE	DE50	1898	5642	OC	FUT,CYLCMD	SET CYLINDER	MST56420
003CF2	240F		5643	LIS	RO,15		MST56430
003CF4	41F0	10A4	5644	BAL	R15,TIMER	UNCONDY WAIT 15 MSEC.	MST56440
003CF8	DE50	189F	5645	OC	FUT,SEKRC	RE-SEEK 'CURRENT CYLINDER'	MST56450
003CFC	C800	0096	5646	LHI	RO,150		MST56460
003D00	41F0	10A4	5647	BAL	R15,TIMER	UNCONDY WAIT 150 MSEC.	MST56470
003D04	58F0	1934	5648	RER1	LDA RETN,RERN	GET RERUN ADDRESS	MST56480
003D08	4800	18D8	5649	LH	RO,SVCNUM		MST56490
003DOC	2703		5650	SIS	RO,3	XFER LEGAL (SVC'S 0-3) ?	MST56500
003DOE	212B		5651	BPS	RER.3	BRANCH: NO.	MST56510
003D10	5810	18F8	5652	XFER	LDA R1,BLKADRS		MST56520
003D14	D321	0002	5653	LB	R2,2(R1)	GET TRANSFER SPEC	MST56530
003D18	C420	007F	5654	NHI	R2,X'7F'		MST56540
003D1C	2334		5655	BZS	RER.3	BRANCH: NO VECTOR TO TAKE	MST56550
003D1E	1122		5656	SLLS	R2,LADC		MST56560
003D20	58F2	3E30	5657	LDA	RETN,XFERTAB-ADC(R2)		MST56570
			5660	ELSE			MST56600
003D24	50F0	18F4	5661	RER.3	ST RETN,SVCPSW+4	SAVE NEW PSW LOC	MST56610
003D28			5662	ENDC			MST56620
003D28	43C0	3A00	5663	B	COMRETN	RETURN TO RERUN ADDRESS	MST56630
			5665	*	RESERVED TO ALTERNATE CHANNEL - ABORT SUBTEST.		MST56650
			5666	*			MST56660
003D2C	E650	1ABE	5667	RESERVED	LDAL R5,MSG19	'ALTERNATE CHANNEL BUSY'	MST56670
003D30	2307		5668	BS	TABORT	ABORT TEST	MST56680
			5670	*	SOLID ERROR - ABORT SUBTEST.		MST56700
			5671	*			MST56710
003D32	48C0	18BA	5672	EURC	LH RO,FLAGS	LOAD MODULE FLAGS	MST56720
003D36	4210	3D7A	5673	EM	TABOR.1	BRANCH: REFORMAT ABORTED.	MST56730
003D3A	E650	1A5F	5674	LDAL	R5,MSG14		MST56740

## ERROR HANDLER

003D3E	4050 15BC	5675	TABORT	STH	R5,ISITERR		MST56750
003D42	4050 15BE	5676		STH	R5,NOERR	SUPPRESS THAT PRINT.	MST56760
003D46	41F0 1110	5677		BAL	R15,PRINT	'SOLID ERROR'	MST56770
003D4A	4860 1604	5678		LH	WKO,ETESTNO		MST56780
003D4E	4060 1828	5679		STH	WKO,MSG24+6		MST56790
003D52	E6E0 1922	5680		LDAI	R5,MSG24		MST56800
003D56	41F0 1110	5681		BAL	R15,PRINT	'TEST XX ABORTED'	MST56810
003D5A	2400	5682		LIS	RO,0		MST56820
003D5C	4000 15BC	5683		STH	RO,ISITERR		MST56830
003D60	4800 18BC	5684	TESTAUT1	LH	RO,RFMTFLG	REQUIRES REFORMAT ?	MST56840
003D64	4330 0E1C	5685		BZ	TSTEND	BRANCH: NO.	MST56850
003D68	48C0 17AE	5686		LH	RO,NOAUTO+6	TEST IF REFORMAT INHIBITED	MST56860
003D6C	4230 0E1C	5687		BNZ	TSTEND	BRANCH: INHIBITED.	MST56870
003D70	4810 0A22	5688		LH	R1,PSW2		MST56880
003D74	9501	5689		EPSR	RO,R1	SELECT USER REGISTER SET	MST56890
003D76	4300 2D4E	5690		B	REFORMAT	PERFORM AUTO RE-FORMAT.	MST56900
		5691	*				MST56910
003D7A	E650 1BD7	5692	TABOR.1	LDAI	R5,MSG34		MST56920
003D7E	4050 15BC	5693		STH	R5,ISITERR		MST56930
003D82	41F0 1110	5694		BAL	R15,PRINT	'REFORMAT ABORTED'	MST56940
003D86	4300 0AD6	5695		B	OPTIN	HALT TESTING.	MST56950
		5697	SEQTAB	EQU	*	BIT TABLE FOR SEQUENCING PRINTOUT	MST56970
003D8A	F800	5698		DCX	F800	SVC 0	MST56980
003D8C	F800	5699		DCX	F800	SVC 1	MST56990
003D8E	F800	5700		DCX	F800	SVC 2	MST57000
003D90	F800	5701		DCX	F800	SVC 3	MST57010
003D92	7800	5702		DCX	7800	SVC 4	MST57020
003D94	0400	5703		DCX	0400	SVC 5	MST57030
003D96	7A00	5704		DCX	7A00	SVC 6	MST57040
003D98	7900	5705		DCX	7900	SVC 7	MST57050
003D9A	F080	5706		DCX	F080	SVC 8	MST57060
003D9C	4040	5707		DCX	4040	SVC 9	MST57070
		5709		ALIGN	ADC		MST57090
003DA0	0000 3DA0	5710	SEQVECTS	EQU	*	PRINTOUT MODULE ENTRY ADDRESSES	MST57100
003DA0	0000 3A1C	5711		DAC	SEQ0	STATUS/RPS TESTS	MST57110
003DA4	0000 3A5E	5712		DAC	SEQ1	'ERROR..','LOC..'	MST57120
003DA8	0000 3AE4	5713		DAC	SEQ2	'DEV..STA..';SHOULD BE..'	MST57130
003DAC	0000 3B34	5714		DAC	SEQ3	'STATUS S1 S2 ...'	MST57140
003DB0	0000 3B7A	5715		DAC	SEQ4	'CYL..HEAD..SECT..'	MST57150
003DB4	0000 3BF8	5716		DAC	SEQ5	MESSAGES	MST57160
003DB8	0000 3C02	5717		DAC	SEQ6	'SELCH FA..';'SHOULD BE..'	MST57170
003DBC	0000 3C30	5718		DAC	SEQ7	'BYTES..READ..';'SHOULD BE..'	MST57180
003DC0	0000 3C60	5719		DAC	SEQ8	'RPS..';'SHOULD BE..'	MST57190
003DC4	0000 3C88	5720		DAC	SEQ9	'BACKGROUND FAILURE'	MST57200

## PARAMETER BLOCKS

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5722 * PARAMETER BLOCKS DEFINED HERE ARE USED BY THE SVC.DRV COMMON STATUS      MST57220
5723 * TEST ROUTINE. ENTRIES IN THE PARAMETER BLOCK HAVE THE FOLLOWING          MST57230
5724 * MEANINGS:                                                                  MST57240
5725 *                                                                              MST57250
5726 *          +0 - STATUS MASK                                                  MST57260
5727 *          +1 - STATUS IMAGE                                                 MST57270
5728 *          +2 - TRANSFER CONTROL                                             MST57280
5729 *          BIT 0                                                              MST57290
5730 *                IF BIT 0 = 0, TRANSFER IS TAKEN AFTER ERROR PRINT          MST57300
5731 *                IF BIT 0 = 1, TRANSFER TAKEN IMMEDIATELY ON ERROR          MST57310
5732 *          BITS 1-7                                                            MST57320
5733 *          POINTER TO 127-ENTRY (MAX) VECTOR TABLE                          MST57330
5734 *          +3 - ERROR NUMBER NN                                              MST57340

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5736 *                                                                              MST57360
5737 *                                                                              MST57370
5738 *          DRIVE STATUS DICTIONARY                                           MST57380
5739 *                                                                              MST57390
5740 *          BIT 0 DRIVE WRITE PROTECT                                          MST57400
5741 *          BIT 1 NOT USED                                                     MST57410
5742 *          BIT 2 ALTERNATE CHANNEL SELECTED                                  MST57420
5743 *          BIT 3 DRIVE UNSAFE                                                 MST57430
5744 *          BIT 4 DRIVE NOT READY                                              MST57440
5745 *          BIT 5 EXAMINE                                                      MST57450
5746 *          BIT 6 SEEK INCOMPLETE                                             MST57460
5747 *          BIT 7 DRIVE OFF-LINE                                              MST57470
5748 *                                                                              MST57480
5749 *                                                                              MST57490
5750 *          CONTROLLER STATUS DICTIONARY                                       MST57500
5751 *                                                                              MST57510
5752 *          BIT 0 WRITE PROTECT                                                MST57520
5753 *          BIT 1 HEADER COMPARE FAILURE                                       MST57530
5754 *          BIT 2 DEFECTIVE SECTOR                                             MST57540
5755 *          BIT 3 CYLINDER OVERFLOW                                           MST57550
5756 *          BIT 4 BUSY (SHOULD BE IGNORED)                                    MST57560
5757 *          BIT 5 EXAMINE                                                      MST57570
5758 *          BIT 6 CONTROLLER IDLE                                              MST57580
5759 *          BIT 7 DATA TRANSFER ERROR                                         MST57590
5760 *                                                                              MST57600
5761 *          -----                                                             MST57610

003DC8 0800 5763 PBLK01 DB BSY,0 NOT BUSY, SELCH MST57630
003DCA 0C11 5764 DCX 0011 ERROR NUMBER MST57640

003DCC FE0A 5766 PBLK02 DB X'FE',BSY+IDLE BSY+IDLE,CTRLR (DTE=DON'T CARE) MST57660
003DCE 0021 5767 DCX 0021 ERROR NUMBER MST57670

003DD0 2000 5769 PBLK03 DB ALFCHAN,0 ALFCHAN NOT BUSY, DRIVES MST57690
003DD2 0531 5770 DCX 0531 (TRANSFER) MST57700

003DD4 FF00 5772 PBLK04 DB -1,0 ZERO STATUS, DRIVES MST57720

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## PARAMETER BLOCKS

003DD6	0031	5773		DCX	0031	ERROR NUMBER	MST57730
003DD8	0202	5775	PBLK05	DB	SEEKINC,SEEKINC	SEEK INCOMPLETE, DRIVES	MST57750
003DDA	0032	5776		DCX	0032	ERROR NUMBER	MST57760
003DDC	0200	5778	PBLK06	DB	SEEKINC,0	SEEKINC RESET, DRIVES	MST57780
003DDE	0031	5779		DCX	0031	ERROR NUMBER	MST57790
003DE0	FFC8	5781	PBLK07	DB	X'FF',NOTRDY	NOTRDY SET, DRIVES	MST57810
003DE2	0032	5782		DCX	0032	ERROR NUMBER	MST57820
003DE4	F726	5784	PBLK08	DB	X'F7',DEFSEC+EX+IDLE	DEF SEC, CTRLR	MST57840
003DE6	0022	5785		DCX	0022	ERROR NUMBER	MST57850
003DE8	F703	5787	PBLK09	DB	X'F7',IDLE+DATERR	LRC ERROR, CTRLR	MST57870
003DEA	0022	5788		DCX	0022	ERROR NUMBER	MST57880
003DEC	F746	5790	PBLK0A	DB	X'F7',HDFAIL+EX+IDLE	HEADER FAIL, CTRLR	MST57900
003DEE	0022	5791		DCX	0022	ERROR NUMBER	MST57910
003DF0	F786	5793	PBLK0B	DB	X'F7',WRTPRT+EX+IDLE	WRITE PROTECT, CTRLR	MST57930
003DF2	0022	5794		DCX	0022	ERROR NUMBER	MST57940
003DF4	F716	5796	PBLK0C	DB	X'F7',CYLOV+EX+IDLE	CYLINDER OVERFLOW,CTRLR	MST57960
003DF6	0022	5797		DCX	0022	ERROR NUMBER	MST57970
003DF8	0800	5799	PBLK0D	DB	BSY,0	NOT BUSY, SELCH	MST57990
003DFA	0011	5800		DCX	0011	ERROR NUMBER	MST58000
003DFC	F702	5802	PBLK0E	DB	X'F7',IDLE	IDLE, CTRLR	MST58020
003DFE	0021	5803		DCX	0021	ERROR NUMBER	MST58030
003E00	0909	5805	PBLK0F	DB	BSY+OFFLINE,BSY+OFFLINE	BOTH SET, DRIVES	MST58050
003E02	0032	5806		DCX	0032	ERROR NUMBER	MST58060
003E04	F500	5808	PBLK13	DB	X'F5',0	BSY+SEEKINC NOT TESTED, DRIVES	MST58080
003E06	0031	5809		DCX	0031	ERROR NUMBER	MST58090
003E08	FF02	5811	PBLK14	DB	-1,IDLE	IDLE ONLY, CTRLR	MST58110
003E0A	0121	5812		DCX	0121	(TRANSFER) ERROR NUMBER	MST58120



## PARAMETER BLOCKS

003E0C	F702	5814	PBLK16	DB	X'F7',IDLE	IDLE, CTRLR	MST58140
003E0E	0221	5815		DCX	0221	(TRANSFER)	MST58150
003E10	FF84	5817	PBLK18	DB	-1,WRTprt+EX	WRITE PROTECT+EXAMINE, DRIVES	MST58170
003E12	0032	5818		DCX	0032	ERROR NUMBER	MST58180
003E14	0000	5820	PBLK20	DB	0,0	BACKGROUND TEST FAILURE	MST58200
003E16	0091	5821		DCX	0091	ERROR NUMBER	MST58210
003E18	F702	5823	PBLK21	DB	X'F7',IDLE	BUSY+IDLE ONLY, CTRLR	MST58230
003E1A	0021	5824		DCX	0021	ERROR NUMBER	MST58240
003E1C	0000	5826	PBLK22	DB	0,0	DRIVE RPS FAILURE	MST58260
003E1E	0081	5827		DCX	0081	ERROR NUMBER	MST58270
003E20	F702	5829	PBLK23	DB	X'F7',IDLE	IDLE ONLY, CTRLR	MST58290
003E22	0221	5830		DCX	0221	(TRANSFER)	MST58300
003E24	F726	5832	PBLK25	DB	X'F7',DEFSEC+EX+IDLE	DEFECTIVE SECTOR	MST58320
003E26	0322	5833		DCX	0322	(TRANSFER)	MST58330
003E28	F702	5835	PBLK26	DB	X'F7',IDLE	IDLE, CTRLR	MST58350
003E2A	0021	5836		DCX	0021	ERROR NUMBER	MST58360
003E2C	FF08	5838	PBLK30	DB	-1,NOTRDY	NOT READY, DRIVES	MST58380
003E2E	0031	5839		DCX	0031	ERROR NUMBER	MST58390
003E30		5841		DS	4	DUMMY	MST58410
003E34	0000 3718	5843	XFERTAB	DAC	ERRCK	VECT 01	MST58430
003E38	0000 3382	5844		DAC	DXPL.1	VECT 02	MST58440
003E3C	0000 3610	5845		DAC	FLAG.0	VECT 03	MST58450
003E40	0000 2D52	5846		DAC	TEST17	VECT 04	MST58460
003E44	0000 3D2C	5847		DAC	RESERVED	VECT 05	MST58470
003E48		5848		DS	ADC	DUMMY	MST58480
	0000 3E4B	5850	LNZE	EQU	*-1		MST58500



## CHKSUM/M17 PUNCHER

003F60	2400	5869	SCHKSUM	LIS	R0,0	PUNCH M17 TAPE WITH CHECKSUM	MST58690
003F62	9510	5870		EPSR	R1,R0	SELECT REG. SET 0	MST58700
		5871	*				MST58710
003F64	E610 0A00	5872		LDAI	R1,ORIGIN1	START	MST58720
003F68	2421	5873		LIS	R2,1	INCREMENT	MST58730
003F6A	E630 3E4B	5874		LDAI	R3,LNZB	FINAL	MST58740
003F6E	2440	5875		LIS	R4,0	CHECKSUM BYTE	MST58750
003F70	D351 0000	5876	\$GEN	LB	R5,0(R1)		MST58760
003F74	0745	5877		XAR	R4,R5		MST58770
003F76	C110 3F70	5878		BXLE	R1,\$GEN		MST58780
003F7A	D240 0097	5879		STB	R4,MN+3	CHECKSUM BYTE TO BOOT LOADER	MST58790
		5880	*				MST58800
003F7E	C810 0080	5881	\$TAPE	LHI	R1,X'0080'		MST58810
003F82	9E21	5882		OCR	R2,R1	DISPLAY : NORMAL MODE	MST58820
003F84	9444	5883		EXBR	R4,R4		MST58830
003F86	9824	5884		WHR	R2,R4	CHECKSUM BYTE TO D1	MST58840
003F88	9411	5885		EXBR	R1,R1		MST58850
003F8A	9501	5886		EPSR	R0,R1	HALT PROCESSOR.	MST58860
003F8C	D360 007A	5888	\$PUNCH	LB	R6,X'7A'	GET BOUTDV (PUNCH) ADDRESS.	MST58880
003F90	DE60 007B	5889		OC	R6,X'7B'	START TAPE PUNCH	MST58890
003F94	9D60	5890		SSR	R6,R0		MST58900
003F96	2081	5891		BTBS	8,1		MST58910
003F98	41F0 3FDA	5892		BAL	R15,\$STAPL	PUNCH LEADER	MST58920
003F9C	9411	5893		EXBR	R1,R1	(R1) = X'0080'	MST58930
003F9E	C830 00CF	5894		LHI	R3,X'CF'		MST58940
003FA2	DA61 0000	5895	\$PNCH1	WD	R6,0(R1)	PUNCH BOOT LOADER	MST58950
003FA6	9D60	5896		SSR	R6,R0		MST58960
003FA8	2081	5897		BTBS	8,1		MST58970
003FAA	C110 3FA2	5898		BXLE	R1,\$PNCH1		MST58980
003FAE	41F0 3FE0	5899		BAL	R15,\$STAPL1	PUNCH ONE-FOLD GAP.	MST58990
		5900	*				MST59000
003FB2	D340 0097	5901		LB	R4,MN+3	GET CHECKSUM BYTE	MST59010
003FB6	E610 0A00	5902		LDAI	R1,ORIGIN1	(NORMALLY X'A00')	MST59020
003FBA	E630 3E4B	5903		LDAI	R3,LNZB		MST59030
003FBE	D351 0000	5904	\$PNCH2	LB	R5,0(R1)	PUNCH PROGRAM	MST59040
003FC2	0745	5905		XAR	R4,R5		MST59050
003FC4	9A65	5906		WDR	R6,R5		MST59060
003FC6	9401	5907		EXBR	R0,R1		MST59070
003FC8	9820	5908		WHR	R2,R0	DATA ADDRESS TO DISPLAY.	MST59080
003FCA	9D60	5909		SSR	R6,R0		MST59090
003FCC	2081	5910		BTBS	8,1		MST59100
003FCE	C110 3FBE	5911		BXLE	R1,\$PNCH2		MST59110
003FD2	41F0 3FDA	5912		BAL	R15,\$STAPL	PUNCH TRAILER.	MST59120
003FD6	4300 3F7E	5913		B	\$TAPE	DISPLAY CHECKSUM, HALT PROCESSOR.	MST59130
003FDA	C8C0 0100	5915	\$TAPL	LHI	R0,256	TO PUNCH BLANK LEADER	MST59150
003FDE	23C3	5916		BS	\$STAPLP		MST59160
003FE0	C8C0 0355	5917	\$TAPL1	LHI	R0,85	TO PUNCH 1-FOLD GAP	MST59170
003FE4	27C1	5918	\$TAPLP	SIS	R0,1		MST59180
003FE6	032F	5919		BNPR	R15	RETURN	MST59190
003FE8	2430	5920		LIS	R3,0		MST59200

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003FEA	9A63	5921	WDR	R6,R3	PUNCH BLANK FRAME	MST59210
003FEC	9D68	5922	SSR	R6,R8		MST59220
003FEE	2081	5923	BTBS	8,1		MST59230
003FF0	22C6	5924	BS	STAPLP	CONTINUE.	MST59240
		5925				MST59250
003FF2		5926	END			MST59260



## CHKSUM/M17 PUNCHER

CLEAR	0000	189D	5634					
CLIF2ND	0000	15B6						
CLIFADR	0000	0A14						
CLIFNRD	0000	15B7						
CLIFRD	0000	15B4						
CLIFWRT	0000	15B5						
CLRNOM	0000	2E24						
CLRNOM1	0000	2D2C						
CMD.30	0000	18A8	1878	2403	2410	2417		
CMD.31	0000	18A9						
CMD.32	0000	18AA						
CMD.34	0000	18AB						
CMD.35	0000	18AC						
CMD.36	0000	18AD	2404					
CMD.38	0000	18AE	2397					
CMD.39	0000	18AF						
CMD.3A	0000	18B0	2411					
CNTDOWN	0000	37AC	2422	3241	3650	3705	4031	
COMM	0000	152A						
COMM1	0000	1532						
COMR.1	0000	3A12						
COMRET	0000	0FAC						
COMRETW	0000	3A00	5663	5663	5663			
CON2ND	0000	15A4						
CONADR	0000	15A0	925	946				
CONDRV	0000	139C						
CONENRD	0000	15A5						
CONRD	0000	15A2	922					
CONRQ2S	0000	15AC						
CONTIN	0000	1784	548					
CONTINUE	0000	37B6						
CONWRT	0000	15A3						
COUNT	0000	15CC	511	525	527			
COUNTER	0000	18E6	3292	3648	3695	4013	4289	
CRLF	0000	11B0	326	352	934	1685	1710	
CRT	0000	0A7A						
CRT2	0000	0A8A						
CRT2ND	0000	15AE						
CRTDRV	0000	1388						
CRTENRD	0000	15AF						
CRTGET	0000	133E						
CRTRD	0000	15A6						
CRTRQ2S	0000	15AA						
CRTWRT	0000	15A7						
CURCYL	0000	18E2	4980	5001	5623	5641		
CURSECT	0000	18DC	4978					
CURSECT2	0000	18DE						
CWA.1	0000	348A	4769	4789				
CWAIT	0000	347C	4242	4996				
CYLCHD	0000	1898	5642					
CYLOV	0000	0010	5796					
CYLTAB	0000	1892						
DATA	0000	1730	2511	4515				
DATERR	0000	0001	5787					

## CHKSUM/M17 PUNCHER

DCAD	0000	0003	4765	4766	5033	5626	5627
DECTAB	0000	15D0					
DEFEND	0000	4800					
DEFSEC	0000	0020	5784	5832			
DEFTSTS	0000	1814					
DEVINT	0000	1802	1197	5238			
DEVMSG	0000	1624	701				
DEVMSG2	0000	1634					
DEVSADR	0000	17F4	1191	5233			
DISCON	0000	16F4	5626				
DISPLAY	0000	366E					
DRIVE	0000	1700					
DRV.1	0000	39B2					
DRV.2	0000	39C6					
DRV.3	0000	39CA					
DWA.1	0000	34CA	4803				
DWA.2	0000	34DC	4801				
DWAIT	0000	34BC	4756	4998			
DXTL.1	0000	3382	5844				
DXTL.2R	0000	3390					
DXTL.4R	0000	33B0					
DXTL.5R	0000	33BE					
ECHO	0000	123E	1144				
ECHRTM	0000	125A	924				
EDATA	0000	18D0					
EOTMSG	0000	168E					
ERANK	0000	3542	4294				
ERANK.1	0000	357A	2676				
ERASX	0000	3346					
ERPSCWT	0000	18CE	4024				
ERR	0000	0F08					
ERR1	0000	0FC4					
ERRALL	0000	0F7A					
ERRCK	0000	3718	5843				
ERRCK1	0000	3724					
ERRCOM	0000	0F92					
ERRCOM1	0000	0FAE					
ERRCOM2	0000	0F14					
ERRD	0000	0F26					
ERRD1	0000	0FCE					
ERRDEV	0000	1598	4765	4776	4796		
ERRDS	0000	0F4E					
ERRDS1	0000	0FFE	5463				
ERRFLG	0000	193C	2673	2681	3957	4298	
ERRFLG1	0000	18BE					
ERRL	0000	0F62					
ERRL1	0000	1024	5454				
ERRLVL	0000	1668					
ERRMSG	0000	15FE					
ERRNC	0000	1606					
ERROR1	0000	1D36					
ERROR10	0000	1D66	1859	1872			
ERROR11	0000	1D6C	1862	1866			
ERROR12	0000	1D74	5211	5213			

















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5682	5683	5684	5685	5689	5869	5870	5886	5890	5896	5907	5908	906
907	917	920	938	938	939	944	946	947	954	955	5649	5650
5672	5682	5683	5684	5686	5689	5869	5870	5886	5890	5896	5907	5908
1141	1178	1186	5649	5650	5672	5682	5683	5684	5686	5689	5869	5870
5886	5890	5896	5907	5908	1711	5649	5650	5672	5682	5683	5684	5686
5689	5869	5870	5886	5890	5896	5907	5908	5649	5650	5672	5682	5683
5684	5686	5689	5869	5870	5886	5890	5896	5907	5908	2098	2099	5649
5650	5672	5682	5683	5684	5686	5689	5869	5870	5886	5890	5896	5907
5908	2398	2399	2404	2405	2406	2411	2412	2413	2417	2418	2419	2425
5649	5650	5672	5682	5683	5684	5686	5689	5869	5870	5886	5890	5896
5907	5908	2658	2659	2660	2661	2664	2665	2666	2667	2672	2673	2678
2679	2680	2681	5649	5650	5672	5682	5683	5684	5686	5689	5869	5870
5886	5890	5896	5907	5908	2991	2993	2997	2998	3000	3001	3009	3010
3020	3021	5649	5650	5672	5682	5683	5684	5686	5689	5869	5870	5886
5890	5896	5907	5908	3279	3280	3281	3284	3285	3289	3290	3291	3292
3293	3296	5649	5650	5672	5682	5683	5684	5686	5689	5869	5870	5886
5890	5896	5907	5908	3608	3609	3645	3646	3647	3648	3689	3690	3692
3698	3757	3758	3759	5647	5649	5650	5672	5682	5683	5684	5686	5689
5869	5870	5886	5890	5896	5907	5908	3967	3968	3970	3971	4014	4029
5649	5650	5672	5682	5683	5684	5686	5689	5869	5870	5886	5890	5896
5907	5908	4245	4246	4247	4249	4288	4289	4290	4291	4292	4293	4295
4296	4297	4298	4301	4302	4306	5649	5650	5672	5682	5683	5684	5686
5689	5869	5870	5886	5890	5896	5907	5908	4515	4518	4538	4543	4557
4562	5649	5650	5672	5682	5683	5684	5686	5689	5869	5870	5886	5890
5896	5907	5908	4762	4763	4773	4774	4793	4794	4816	5649	5650	5672
5682	5683	5684	5686	5689	5869	5870	5886	5890	5896	5907	5908	4980
4981	4981	4982	5020	5023	5024	5031	5032	5033	5649	5650	5672	5682
5683	5684	5686	5689	5869	5870	5886	5890	5896	5907	5908	5206	5231
5233	5237	5238	5246	5287	5649	5650	5672	5682	5683	5684	5686	5689
5869	5870	5886	5890	5896	5907	5908	5444	5458	5459	5460	5461	5465
5468	5469	5470	5472	5649	5650	5672	5682	5683	5684	5686	5689	5869
5870	5886	5890	5896	5907	5908	5614	5616	5617	5619	5628	5630	5632
5639	5643	5646	5649	5650	5672	5682	5683	5684	5686	5689	5869	5870
5886	5890	5896	5907	5908	5909	5915	5917	5918				
93	104	105	107	112	154	154	155	167	5652	5653	5688	5689
5870	5872	5876	5878	5881	5882	5885	5885	5886	5893	5893	5895	5898
5902	5904	5907	5652	5653	5688	5689	5870	5872	5876	5878	5881	5882
5885	5885	5886	5893	5893	5895	5898	5902	5904	5907	512	513	516
517	523	524	536	537	545	548	5652	5653	5688	5689	5870	5872
5876	5878	5881	5882	5885	5885	5886	5893	5893	5895	5898	5902	5904
5907	698	708	718	721	5652	5653	5688	5689	5870	5872	5876	5878
5881	5882	5885	5885	5886	5893	5893	5895	5898	5902	5904	5907	904
907	910	947	948	952	955	5652	5653	5688	5689	5870	5872	5876
5878	5881	5882	5885	5885	5886	5893	5893	5895	5898	5902	5904	5907
1142	1179	1185	5652	5653	5688	5689	5870	5872	5876	5878	5881	5882
5885	5885	5886	5893	5893	5895	5898	5902	5904	5907	1712	1718	5652
5653	5688	5689	5870	5872	5876	5878	5881	5882	5885	5885	5886	5893
5893	5895	5898	5902	5904	5907	1377	1378	1380	1887	1891	1893	5652
5653	5688	5689	5870	5872	5876	5878	5881	5882	5885	5885	5886	5893
5893	5895	5898	5902	5904	5907	5652	5653	5688	5689	5870	5872	5876
5878	5881	5882	5885	5885	5886	5893	5893	5895	5898	5902	5904	5907
5652	5653	5688	5689	5870	5872	5876	5878	5881	5882	5885	5885	5886
5893	5893	5895	5898	5902	5904	5907	5652	5653	5688	5689	5870	5872
5876	5878	5881	5882	5885	5885	5886	5893	5893	5895	5898	5902	5904

R1 0000 0001

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			5907	5652	5653	5688	5689	5870	5872	5876	5878	5881	5882	5885	5885
			5886	5893	5893	5895	5898	5902	5904	5907	3229	3230	3236	3237	5652
			5653	5688	5689	5870	5872	5876	5878	5881	5882	5885	5885	5886	5893
			5893	5895	5898	5902	5904	5907	3607	3691	3694	3695	5652	5653	5688
			5689	5870	5872	5876	5878	5891	5882	5885	5886	5893	5893	5895	5895
			5898	5902	5904	5907	3961	3964	4012	4013	4020	4021	4023	4024	5652
			5653	5688	5689	5870	5872	5876	5878	5881	5882	5885	5885	5886	5893
			5893	5895	5898	5902	5904	5907	4315	5652	5653	5688	5689	5870	5872
			5876	5878	5881	5882	5885	5885	5886	5893	5893	5895	5898	5902	5904
			5907	4517	4519	4526	4529	4531	4539	4540	4543	4544	4545	5652	5653
			5688	5689	5870	5872	5876	5878	5881	5882	5885	5885	5886	5893	5893
			5895	5898	5902	5904	5907	5652	5653	5689	5689	5870	5872	5876	5878
			5881	5882	5885	5885	5886	5893	5893	5895	5898	5902			
R10	0000	000A	1168	1168	1169	1188									
R11	0000	000B													
R12	0000	000C	737	1695	5446	5474									
R13	0000	000D	5647	5606	5611										
R14	0000	000E	319	1693	1698	1702	1892	2400	2407	2414	2420	4756	4762	4764	4767
			4773	4775	4793	4795	4799	4815	5547	4996	4998	5647	5230	5237	5239
			5454	5463											
R15	0000	000F	5677	5681	5694	5892	5899	5677	5681	5694	5892	5899	5677	5681	5694
			5892	5899	731	732	733	735	739	740	5677	5681	5694	5892	5899
			5677	5681	5694	5892	5899	5677	5681	5694	5892	5899	1686	1688	1690
			1710	1714	1715	1717	1720	5677	5681	5694	5892	5899	5677	5681	5694
			5892	5899	2055	2056	2057	2155	2165	2171	5677	5681	5694	5892	5899
			2402	2409	2416	2421	2422	2426	2429	2430	5677	5681	5694	5892	5899
			2663	2668	2669	2674	2675	2676	2684	2687	5677	5681	5694	5892	5899
			2996	3005	3012	3015	3018	3025	3027	3029	5677	5681	5694	5892	5899
			3228	3241	3286	5677	5681	5694	5892	5899	3650	3700	3705	3756	5677
			5681	5694	5892	5899	3959	4019	4031	5677	5681	5694	5892	5899	4251
			4294	4303	4310	4313	5677	5681	5694	5892	5899	4521	4525	4527	4533
			4534	4546	5677	5681	5694	5892	5899	4817	5677	5681	5694	5892	5899
			5025	5026	5027	5028	5677	5681	5694	5892	5899	5226	5247	5677	5681
			5694	5892	5899	5446	5448	5474	5677	5681	5694	5892	5899	5604	5633
			5635	5640	5644	5647	5677	5681	5694	5892	5899	5912	5919		
R2	0000	0002	89	108	114	156	157	166	168	5653	5654	5656	5657	5873	5882
			5884	5908	320	328	330	332	337	5653	5654	5656	5657	5873	5882
			5884	5908	514	515	516	5653	5654	5656	5657	5873	5882	5884	5908
			695	699	709	719	722	5653	5654	5656	5657	5873	5882	5884	5908
			950	954	957	957	5653	5654	5656	5657	5873	5882	5884	5908	1131
			1135	1143	1170	1184	1185	1187	1193	5653	5654	5656	5657	5873	5882
			5884	5908	1713	1719	5653	5654	5656	5657	5873	5882	5884	5908	5653
			5654	5656	5657	5873	5882	5884	5908	5653	5654	5656	5657	5873	5882
			5884	5908	5653	5654	5656	5657	5873	5882	5884	5908	5653	5654	5656
			5657	5873	5882	5884	5908	5653	5654	5656	5657	5873	5882	5884	5908
			5653	5654	5656	5657	5873	5882	5884	5908	5653	5654	5656	5657	5873
			5882	5884	5908	3960	3962	3965	5653	5654	5656	5657	5873	5882	5884
			5908	4314	4316	5653	5654	5656	5657	5873	5882	5884	5908	4516	4517
			4518	4528	4529	4530	4540	4541	4542	4545	5653	5654	5656	5657	5873
			5882	5884	5908	4768	4779	4782	4802	5653	5654	5656	5657	5873	5882
			5884	5908	5653	5654	5656	5657	5873	5882	5884	5908	5258	5262	5653
			5654												
R3	0000	0003	94	95	5874	5894	5903	320	329	333	5874	5894	5903	5874	5894
			5903	5874	5894	5903	5874	5894	5903	1131	1132	1136	1171	5874	5894











## CHKSUM/M17 PUNCHER

TDATA	0000 3292	3024	3233	3240	5647															
TDATAX	0000 3280																			
TEMP	0000 3E54	310	313	315																
TEMPA	0000 1940	2154	2157	4525	4533															
TEMPB	0000 1944	2055																		
TEMPC	0000 1948																			
TENS.1	0000 37D2																			
TENSECT	0000 37C2																			
TEST	0000 16A0	2099																		
TEST0	0000 208E																			
TEST1	0000 20CC																			
TEST10	0000 2B0C																			
TEST11	0000 2B36																			
TEST12	0000 2B64																			
TEST13	0000 2B9A																			
TEST14	0000 2BBC																			
TEST15	0000 2C04																			
TEST16	0000 2CA8																			
TEST17	0000 2D52	5846	5846																	
TEST18	0000 2DFA																			
TEST19	0000 2E52																			
TEST1A	0000 2F50																			
TEST1B	0000 3010																			
TEST1C	0000 30A0																			
TEST2	0000 2188																			
TEST3	0000 21C2																			
TEST4	0000 2200																			
TEST5	0000 2344																			
TEST6	0000 25B4																			
TEST7	0000 2682																			
TEST8	0000 2734																			
TEST9	0000 273A																			
TESTA	0000 2740																			
TESTAT	0000 2328																			
TESTAT1	0000 232C	2402	2409	2416	2421															
TESTAUTO	0000 2076																			
TESTAUT1	0000 3D60	4252																		
TESTB	0000 27C8																			
TESTC	0000 28A2																			
TESTD	0000 29B4																			
TESTE	0000 2A18																			
TESTF	0000 2A7C																			
TESTOP	0000 0CB0																			
TESTS	0000 1818	516																		
TIME	0000 0A1C	1870																		
TIMER	0000 10A4	5647	5647	5647	5647	5647	5647	5647	5647	5647	5647	5647	5647	5647	5647	5647	5647	5647	5647	5647
TIMVAL	0000 1724	1868																		
TIMXT	0000 10BC																			
TITLE	0000 1966																			
TOP2	0000 1F52																			
TOTAL	0000 15C6																			
TOTERR	0000 15C8																			
TOTMSG	0000 160A																			
TRACK	0000 000B	1355	1857	1859	1863	2153	2154	2157	2162	2167	2168	2999	3702	3755						

## CHKSUM/M17 PUNCHER

TSECT	0000	363C	5000	5001	5623
TSECT.1	0000	3662	3696		
TSECTA	0000	364C			
TSOLID	0000	3C92			
TST0.1	0000	20C8	2100		
TST1.1	0000	20D6	2163		
TST1.2	0000	20F8	2159		
TST1.4	0000	213C	5003		
TST13.0	0000	2BB0	3651		
TST13.1	0000	2BB4	3645		
TST14.0	0000	2BD6	3693		
TST14.1	0000	2BDA	3706		
TST14.2	0000	2BEE	3699		
TST14.3	0000	2BF6	3701		
TST14.4	0000	2BFA	3689		
TST15.1	0000	2C1A			
TST15.1A	0000	2C3C			
TST15.2	0000	2C46			
TST15.2A	0000	2C5A			
TST15.2B	0000	2C68			
TST15.2C	0000	2C7A			
TST15.3	0000	2C8A			
TST15.4	0000	2C9C	3759		
TST16.1	0000	2CDC			
TST16.3	0000	2CEC			
TST16.4	0000	2D10			
TST16.6	0000	2D1C			
TST18.1	0000	2E14	4015	4032	4036
TST18.2	0000	2E24	4022		
TST18.3	0000	2E34			
TST18.4	0000	2E44	4030		
TST19.3	0000	2EAE			
TST19.4	0000	2EC2			
TST19.5	0000	2EE0			
TST19.6	0000	2F00			
TST19.7	0000	2F04			
TST19.8	0000	2F1C			
TST19.8A	0000	2F2C			
TST19.9	0000	2F3A			
TST1A.1	0000	2F7A			
TST1A.2	0000	2F8E			
TST1A.3	0000	2FB8			
TST1A.4	0000	2FC6			
TST1A.5	0000	300C	4248		
TST1B.1	0000	302E			
TST1B.2	0000	3096	4290	4307	
TST1C.1	0000	30C4			
TST1C.2	0000	30EC			
TST1C.3	0000	30F8			
TST1C.4	0000	311E			
TST1C.5	0000	312A			
TST1C.6	0000	3142			
TST3.1	0000	21D0			