SERIES-16 19-197 MOS MEMORY TEST PART 2

Consists of:

Test Program Description	06-204M95R01
Test Program Listing	06-204F01M96R01
Test Program Listing	06-204F02M96R01
Test Program Paper Tape	06-204F01M17R01
Test Program Paper Tape	06-204F02M17R01

PERKIN-ELMER

Computer Systems Division
2 Crescent Place
Oceanport, N.J. 07757

SERIES-16 19-197 MOS
MEMORY TEST PART 2 PROGRAM DESCRIPTION

1. SERIES-16 19-197 MOS MEMORY TEST PART 2 — 06-204R07

   1.1 Related Documents:

Program Listing	06-204F01M96R01 06-204F02M96R01
Program Paper Tape	06-204F01M17R01 06-204F02M17R01

   1.2 Test Programs to be run prior to loading this test:

Processor Test	06-106

   1.3 Other Applicable Tests:

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

2. PURPOSE OF TEST

The Series-16 19-197 MOS MEMORY TEST PART 2 (06-204) verifies the operation of all 6/16 MOS memories in modules of 16KB, 32KB, and 64KB. 06-202 (PART 1) verifies the operation of all 6/16 8KB MOS memories.

2.1 Test 0 (Memory Search Test)

This test module lists the limits of available memory in the system. If "HILIM" equals 0, the limits are forced to the boundaries that respond to a memory search.

2.2 Test 1 (Bit Set - Reset Test)

This test insures that all available memory bits can be set and reset at will.

2.3 Test 2 (Marching Pattern Test)

This test checks that three patterns can be written throughout memory and complemented.

2.4 Test 3 (0 and 1 Walk Test)

This test marches a 1 through a field of 0's and a 0 through a field of 1's. This test also checks the parity bit.

2.5 Test 4 (Double Operation Column Disturb Test)

This test module checks that a double column disturb will not cause an error.

2.6 Test 5 (Short Count Relocatable Hammer Disturb Test)

This test (short count) relocates a short program throughout memory and executes the program.

2.7 Test 6 (Diagonal Galpat Test)

This test runs a complete diagonal Galpat on each 4K RAM.

2.8 Test 7 (Memory Hold Test)

This test checks the ability of the MOS memory refresh circuit to operate in the event of a power failure.

2.9 Test 8 (Long Count Relocatable Hammer Disturb Test)

This overnight (long count) test checks each test location 65,000 times and checks background for soft failures.

3. MINIMUM HARDWARE REQUIRED

3.1 Processor

5/16 or 6/16 with battery back-up power supply.

3.2 Minimum MOS Memory

16KB or greater (64KB maximum)

(35-600)

3.3 Console Input Device (See Appendix 1)

Teletype or

CRT on Current Loop Interface or

CRT on PASLA/PALM or

Carousel 15, 30, 35, 300

3.4 List Device (See Appendix 1)

Teletype or

CRT on Current Loop Interface or

CRT on PASLA/PALM or

Line Printer or

Carousel 15, 30, 35, 300

3.5 Paper Tape Reader

Teletype or

Carousel 35 or

High Speed Paper Tape Reader

4. REQUIREMENTS OF MACHINE UNDER TEST

This program assumes that the applicable program indicated in Section 1.2 has been run without detecting an error.

5. LOADING PROCEDURE

5.1 Test Tape Format

Absolute, non-zoned object tape (M17) with front end boot-loader. The test program occupies approximately 8K bytes of memory per section.

5.2 Normal Loading Procedure

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'
for TTY or Carousel 35	X'78'	X'0294'
HSPTR	X'78'	X'0399'
HSPTR/P	X'78'	X'1399'

Place the program tape in the paper tape reader.

Execute at address X'30'.

When the processor halts, observe the CHKSUM byte, displayed on the console display register D1. If it is zero, loading is complete. Otherwise, repeat this loading procedure.

5.3 Multi Media Loading Procedure

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

5.4 Program Execution

Refer to Appendix 1 and set up the address for the console input device and the list device.

Address memory location X'100' for Section 1 (F01) or X'2000' for Section 2 (F02). Start program execution and observe that the following title is output to the list device:

S16 19-197 MOS MEMORY TEST PART 2 06-204F01 (or F02)

6. OPERATING PROCEDURES

6.1 Normal Testing

To execute the default tests (Tests 0 through 6) enter the following options from the console device (see Appendix 3). Appendix 2 summarizes the command/option input format.

*TEST	CR		Selects the Default Tests (default 0-6)
*HILIM	0	CR	Selects automatic sizing of the memory under test to include all available memory (default 0)
*SCOPE	0	CR	Selects the Error Option (default 0)
*DTAPAT	FFFF	CR	Selects the background data pattern (default X'FFFF')
*RUN	CR		Starts the test sequence

The program executes Test 0 through Test 6 in the default test sequence. Appendix 4 summarizes expected results.

Section 9 summarizes error messages and fault isolation procedures.

To execute Test 7, enter the following options from the console device (see Appendix 3). Appendix 2 summarizes the command/option input format.

*TEST	7	CR	Selects Test 7
*HILIM	0	CR	Selects automatic sizing of the memory under test to include all available memory
*SCOPE	0	CR	Selects the Error Option
*RUN	CR		Starts the test sequence

The program now executes Test 0 and Test 7 in sequence. Appendix 4 summarizes expected results. Section 7 summarizes error messages and fault isolation procedures.

6.2 Extended Normal Testing

Test 8

To run the long (overnight) Relocatable Hammer Disturb Test, use the following option entry sequence:

*TEST	8	CR
*SCOPE	0	CR
*HILIM	0	CR
*DTAPAT	FFFF	CR
*RUN	CR	

The addresses under test are printed out by Test 0. Test 8 increments the display for each location tested. Errors are printed on the list device and the specified SCOPE option dictates further action of the processor.

6.3 Optional Testing

The appropriate options should be changed (refer to the options table in Appendix 3) for the configuration under test. Overnight testing is allowed by turning the Console Off-Line while the test is running. When the console is returned to the On-Line condition, the program prints its statistics (total number of passes and total errors) when it reaches the end of a test module and after a delay (provided to let CRT warm up). If the console is not returned to the On-Line condition before X'7FFF' passes are executed or X'7FFF' errors are detected, the processor halts and resumes execution only upon depressing RUN (or EXE).

7. ERROR PROCEDURES

7.1 Error Recovery

If the program detects an error in any test, it executes the SCOPE option entered before the start of program execution.

7.2 Error Message and Fault Isolation

Appendix 5 summarizes Error Messages and is designed to guide the user through a systematic fault isolation procedure. Looping can be accomplished by entering the appropriate option (see Appendix 3).

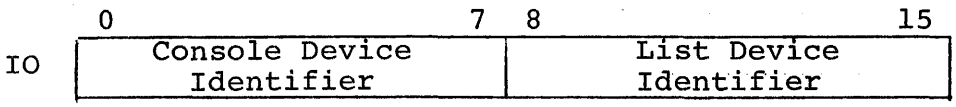
8. PROGRAMMING NOTES

To abort a test in progress, the user must depress and hold the BREAK key on the console device for 5 seconds. The test terminates when interrupts from the console device are enabled.

APPENDIX 1

USER DEVICE DEFINITION

The halfword labeled 'IO' (see the Program Listing) has the default value for Teletype, CRT, or Carousel 15/30/35 (all on Current Loop Interface) as the input/output console device. If the setup is different,'IO' must be changed as follows:



Console Device Identifier	MEANING
X'01'	GDT/CRT on PASLA/PALM interface, strapped for FDX operation and highest baud rate.
X'02'	TTY/GDT/CRT/Carousel 15/30/35 on 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'05'	Micro I/O bus (or adapter).
X'00', X'06' - X'FF'	Reserved. Interpreted at X'02'.

List 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 Current Loop Interface.
X'03'	Line Printer (Data Printer or Centronics) on Line Printer Interface.
X'04'	Carousel 300 on PASLA/PALM Interface, strapped for FDX operation and highest baud rate.
X'05'	Micro I/O bus (or adapter).
X'00', X'06' - X'FF'	Reserved. Interpreted as X'02'

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, then 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 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.
4. The Carousel 300, 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.

APPENDIX 2

COMMAND/OPTION INPUT METHOD

An asterisk (*) is output to the console device to indicate that the program is waiting user input. All option names must be typed in from the console, followed by a space and the desired argument or arguments separated by commas. A carriage return (CR) must be typed to end every command/option input. An invalid command/option name or option value causes a question mark (?) followed by a carriage return (CR), line feed (LF), and an asterisk (*) to be output. If, during command/option entry, an error is made, it can be handled in two ways. The hash mark (#) can be typed to delete the entire line. This causes a carriage return (CR), line feed (LF), and an asterisk (*) to be output. The left arrow (←) or back space (Control-H) can be typed to delete the previous character; or a string of characters can be deleted by typing a left arrow (←) or back space (Control-H) for each character to be deleted.

APPENDIX 3

OPTION TABLE

OPTION	DEFAULT	TESTS	DESCRIPTION
LOLIM	0	ALL	16-Bit low limit address under test (4 Hex.characters)
HILIM	0	ALL	16-Bit high limit address under test (4 Hex. characters)
DATA	FFFF	5 & 8	Data pattern used as background in relocatable hammer disturb tests (4 Hex. characters)
SCOPE	0	ALL	Error handling procedure 0 = Print error data and skip to next test 1 = Print chip number(s) and skip to next test 2 = Print error data and continue test 3 = Print error data and halt 4 = Ignore error and continue test 5 = Print chip number(s) and error data and continue test
TEST	0,1,2,3, 4,5,6	ALL	Test number (0 - 8)
NOMSG	0	ALL	Message handling option 0 = Print all messages 1 = Print only error messages
CONTIN	0	ALL	Testing sequence option 0 = No effect on testing sequence 1 = Run all selected tests continuously (e.g., 0→6, 0→6, 0→6, etc.)
LOOP	0	ALL	Number of loops through each test (0-7FFF)
POUND	A	5	Number of times each location is checked in Test 5

APPENDIX 4
EXPECTED RESULT TABLE

S16 19-197 MOS MEMORY TEST PART 2 06-204F01 (or F02)

```
*TEST
*RUN

TEST 00
MEMORY FOUND IN SEARCH
2000-FFFF (or 0000-1FFF)
NO ERROR
TEST 01
NO ERROR
TEST 02
NO ERROR
TEST 03
NO ERROR
TEST 04
NO ERROR
TEST 05
NO ERROR
TEST 06
MEMORY UNDER GALPAT TEST
2000-FFFF (or 0000-1FFF)
NO ERROR
END OF TEST
*
```

```
*TEST 7
*RUN

TEST 00
ASSIGNED MEMORY
2000 - FFFF (or 0000-1FFF)
NO ERROR
TEST 07
POWER DOWN PROCESSOR FOR 30 SECONDS
NO ERROR
END OF TEST
*
```

```
*TEST 8
*RUN

TEST 00
ASSIGNED MEMORY
2000-FFFF (or 0000-1FFF)
NO ERROR
TEST 08
NO ERROR
END OF TEST
```

APPENDIX 5

EXPECTED ERROR PRINTOUT

If SCOPE = 0, 2, or 3

```
ERROR TTNN
LOC XXXX DATA EXP YYYY DATA READ ZZZZ
```

If SCOPE = 4, No error printout until end of test and then only the number of passes and the number of errors are printed.

If SCOPE = 1 or 5

```
ERROR TTNN
SUSPECTED BAD CHIP DEEE
LOC XXXX DATA EXP YYYY DATA READ ZZZZ
```

Where:
- TT = Test number
- NN = Error number
- D = Drive letter (A OR B)
- EEE = Chip number within drive area
- XXXX = Location of memory failure
- YYYY = Data written to location XXXX
- ZZZZ = Data read from location XXXX

APPENDIX 5 (Cont'd)

ERROR NUMBER	ERROR CONDITION	POSSIBLE EXPLANATION	SUGGESTED ACTION
TT01	Bit did not set in halfword when X'FFFF' was stored at LOC	1. Hard reset bit in Memory Chip. 2. "Soft" reset bit in Memory Chip 3. Timing problem	1. Manually write X'FFFF' to LOC and read LOC 2. Check timing 3. Replace Memory Chip
TT02	Bit did not reset in halfword when 0 was stored at LOC	1. Hard set bit in Memory Chip 2. Hard to reset bit in Memory Chip 3. Timing problem	See TT01
TT03	Bit Pattern was not written/read correctly	1. Hard bit failure (set or reset) 2. Hard to set or reset bit in Memory Chip (soft failure) 3. Timing problem 4. Double addressing	See TT01
TT04	Bit Pattern did not complement	1. Hard bit failure (set or reset) 2. Hard to set or reset bit in Memory Chip (soft failure) 3. Timing problem	See TT01
TT05	Complement bit pattern was disturbed while writing to another location	1. Double addressing 2. Timing problem 3. Hard to set or reset bit in Memory Chip (soft failure)	1. Check refresh circuitry. 2. Check memory chip address lines. 3. Replace memory chip.

ERROR NUMBER	ERROR CONDITION	POSSIBLE EXPLANATION	SUGGESTED ACTION
TT06	Original data pattern did not restore properly	See TT05	See TT05
TT07	Test Bit did not reset in halfword when a 0 was walked through a field of all 1's	1. Hard to reset bit in memory chip. 2. Timing problem	See TT01
TT08	Test Bit did not set in halfword when a 1 was walked through a field of all 0's	1. Hard to set bit in memory chip 2. Timing problem	See TT01
TT09	Original Background Pattern did not set after single disturb	1. Refresh problem 2. Double addressing 3. Bad memory chip	See TT05
TT0A	Complement Background Pattern did not set while doing a Double Disturb	See TT09	See TT05
TT0B	Complement Background Pattern did not set after a Single Disturb	See TT09	See TT05

ERROR NUMBER	ERROR CONDITION	POSSIBLE EXPLANATION	SUGGESTED ACTION
TT0C	Original Background Pattern did not reset while doing a Double Disturb	See TT09	See TT05
TT0D	Bit(s) failed to set or reset while doing a Location Pound	See TT04	See TT01
TT0E	Background cell was disturbed when a test Location was written	See TT05	See TT05
TT10	Test Cell failed to complement on a Diagonal Galpat	1. Timing problem 2. "Soft" memory chip failure	1. Check timing circuitry 2. Replace memory chip
TT11	Running Cell changed when Test Cell was written to on Diagonal Galpat	1. Refresh problem 2. Timing problem 3. "Soft" memory chip failure	1. Check refresh circuitry 2. Check timing circuitry 3. Replace memory chip
TT12	Parity Bit Error	1. Parity check failure 2. Refresh problem 3. Timing proglem 4. "Soft" memory chip failure	1. Check parity circuitry 2. Check refresh circuitry 3. Check timing circuitry 4. Replace memory chip
TT2N	Upon powering down Processor, Memory changed at LOC indicated and was detected on read pass "N"	1. P12 or P5S problem 2. Refresh problem 3. Memory chip fails to refresh in standby (burst mode)	1. Check P12 and P5S (W/WO AC power) 2. Check refresh circuitry 3. Replace memory chip

ERROR NUMBER	ERROR CONDITION	POSSIBLE EXPLANATION	SUGGESTED ACTION
TTF1	16-Bit Fixed Point Arith. Fault Interrupt (or 32-Bit Arith. Fault Interrupt)	Fixed-Point division by zero; Fixed-Point quotient overflow; Floating-Point division by zero; Floating-Point exponent overflow or underflow	Depress INIT. Restart program from beginning
TTF2	Illegal Instruction Interrupt	Program did not load properly; program destroyed	Reload program and start from beginning
TTF3	Machine Malfunction* Interrupt	Power fail/restore; Initialize; Memory malfunction; alignment wrong on Fullword operation	Machine will be halted. Depress RUN
TTF4	Unexpected device spurious interrupt	Device interrupt queued; RACK0/TACK0 problem	Depress INIT. Restart program from beginning Check back panel
TTF5	16-Bit Floating Point Divide Fault Interrupt. (32-Bit Relocation/Protect Interrupt)	16-Bit machine - see TTF1; MAC interrupt queued.	16-Bit machine - see TTF1. Store ZERO into MAC interrupt status register (X'342', X'542', or X'942'). Restart program from beginning.
TTF6	An External Interrupt into the wrong interrupt level has occurred.	"INTLEV" option incorrect; RACK0/TACK0 problem; Device attached at wrong interrupt level.	Check 'INTLEV' option. Check back panel. Depress INIT. Restart program from beginning.

*Condition Code given in PSW printed gives nature of machine malfunction.

PROG= MOSP21 ASSEMBLED BY CAL 03-066R05-00 (32-BIT)

```
                1           CROSS                                                   MOS00010
                2           TARGT 16                                                MOS00020
                3           WIDTH 120                                               MOS00030
                4   MOSP21  PROG  S16 19-197 MOS MEMORY TEST PART 2 06-204F01M96R01A13  MOS00040
                5           SQCHK                                                   MOS00050
                6   ********************************************************        MOS00060
                7   *       SERIES-16 19-197 MOS MEMORY TEST PART 2 - SECTION 1 (F01)  MOS00070
                8   *                                                               MOS00080
                9   *       COPYRIGHT        INTERDATA, INC.          SEPTEMBER, 1976  MOS00090
               10   *                                                               MOS00100
               11   *       REVISED          PRODUCT SUPPORT          APRIL, 1978     MOS00110
               12   *       REVISION R01 CONTAINS 5/16 MICRO I/O BUS SUPPORT.        MOS00120
               13   *                                                               MOS00130
               14   *       THIS PROGRAM TESTS THE UPPER REGION OF A 16KB OR LARGER MOS  MOS00140
               15   *       MEMORY IN A 5/16 OR 6/16 INTERDATA PROCESSOR WITH AN     MOS00150
               16   *       OPTIONAL BATTERY BACK-UP POWER SUPPLY.                   MOS00160
               17   *                                                               MOS00170
               18   *       TEST 0                   MEMORY SEARCH TEST              MOS00180
               19   *                                                               MOS00190
               20   *       TEST 1                   BIT SET-RESET TEST              MOS00200
               21   *                                                               MOS00210
               22   *       TEST 2                   MARCHING PATTERN TEST           MOS00220
               23   *                                                               MOS00230
               24   *       TEST 3                   0 AND 1 WALK TEST               MOS00240
               25   *                                                               MOS00250
               26   *       TEST 4                   DOUBLE OPERATION COLUMN DISTURB TEST  MOS00260
               27   *                                                               MOS00270
               28   *       TEST 5                   SHORT COUNT RELOCATABLE         MOS00280
               29   *                                HAMMER DISTURB TEST             MOS00290
               30   *                                                               MOS00300
               31   *       TEST 6                   DIAGONAL GALPAT TEST            MOS00310
               32   *                                                               MOS00320
               33   *       TEST 7                   MEMORY HOLD TEST                MOS00330
               34   *      (REQUIRES MANUAL INTERVENTION AND BATTERY BACK-UP POWER SUPPLY)  MOS00340
               35   *                                                               MOS00350
               36   *       TEST 8 (OPTIONAL)        LONG COUNT RELOCATABLE          MOS00360
               37   *                                HAMMER DISTURB TEST             MOS00370
               38   *                                                               MOS00380
               39   *       THE DEFAULT TESTS ARE 0, 1, 2, 3, 4, 5, & 6.            MOS00390
               40   *                                                               MOS00400
               41   *       TEST 0 IS EXECUTED WHENEVER "RUN" IS ENTERED.           MOS00410
               42   *          IF "LOLIM" OR "HILIM" = 0, TEST 0 DOES A TOP OF MEMORY  MOS00420
               43   *       SEARCH FORCING "LOLIM" AND "HILIM" TO THE BOUNDRIES PRINTED ON  MOS00430
               44   *       THE LIST DEVICE.                                        MOS00440
               45   *          IF NEITHER "LOLIM" OR "HILIM" IS 0, TEST 0 PRINTS THE  MOS00450
               46   *       AREA UNDER TEST (LOLIM-HILIM) ON THE LIST DEVICE.       MOS00460
               47   *                                                               MOS00470
               48   *       TEST 7 REQUIRES MANUAL INTERVENTION AND CANNOT BE LOOPED ON  MOS00480
               49   *       WHILE THE PROCESSOR IS UNATTENDED.                      MOS00490
               50   *                                                               MOS00500
               51   *       TEST 8 IS AN OPTIONAL, LONG TERM (I.E.,OVERNIGHT) TEST.  MOS00510
               52   ********************************************************************  MOS00520
```

BOOTSTRAP LOADER

```
                    0000 0000          54  R0      EQU   0                                                    MOS00540
                    0000 0001          55  R1      EQU   1                                                    MOS00550
                    0000 0002          56  R2      EQU   2                                                    MOS00560
                    0000 0003          57  R3      EQU   3                                                    MOS00570
                    0000 0004          58  R4      EQU   4                                                    MOS00580
                    0000 0005          59  R5      EQU   5                                                    MOS00590
                    0000 0006          60  R6      EQU   6                                                    MOS00600
                    0000 0007          61  R7      EQU   7                                                    MOS00610
                    0000 0008          62  R8      EQU   8                                                    MOS00620
                    0000 0009          63  R9      EQU   9                                                    MOS00630
                    0000 000A          64  R10     EQU   10                                                   MOS00640
                    0000 000B          65  R11     EQU   11                                                   MOS00650
                    0000 000C          66  R12     EQU   12                                                   MOS00660
                    0000 000D          67  R13     EQU   13                                                   MOS00670
                    0000 000E          68  R14     EQU   14                                                   MOS00680
                    0000 000E          69  RET     EQU   14                                                   MOS00690
                    0000 000F          70  R15     EQU   15                                                   MOS00700
                    0000 000F          71  LINK    EQU   15                                                   MOS00710
                                       72  *                                                                  MOS00720
                                       73  *  BOOTLOADER WITH CHKSUM                                          MOS00730
                                       74  *                                                                  MOS00740
0000R                                  75          ORG   X'80'                                                MOS00750
0080   2421                            76          LIS   R2,1                                                 MOS00760
0082   2303                            77          BS    BOOT                                                 MOS00770
0084   17C8                            78          DC    Z(PSWSAVE)       CURRENT PSW SAVE POINTER(32-BIT M/C) MOS00780
0086   17CC                            79          DC    Z(RSAVE)         REGISTER SAVE POINTER(32-BIT M/C)   MOS00790
0088   C810 0100                       80  BOOT    LHI   R1,ORIGIN1       R1 = ADR( FIRST BYTE OF TEST PROG ) MOS00800
008C   C830 177A                       81          LHI   R3,LNZB+1        R3 = ADR( LAST NON-ZERO BYTE )      MOS00810
0090   4030 0022                       82          STH   R3,X'22'         REGISTER SAVE POINTER (16-BIT M/C)  MOS00820
0094   2731                            83          SIS   R3,1                                                 MOS00830
0096   C860 00FF                       84  MN      LHI   R6,X'00FF'       R6 = CHKSUM BYTE = X'MN'            MOS00840
009A   D340 0078                       85          LB    R4,X'78'         INPUT DEV ADR                       MOS00850
009E   DE40 0079                       86          OC    R4,X'79'                                             MOS00860
00A2   9D45                            87  LEADER  SSR   R4,R5                                                MOS00870
00A4   2091                            88          BTBS  9,1              DU,BSY                              MOS00880
00A6   9B45                            89          RDR   R4,R5                                                MOS00890
00A8   0855                            90          LDAR  R5,R5                                                MOS00900
00AA   2234                            91          BZS   LEADER           IGNORE LEADER                       MOS00910
00AC   D251 0000                       92  LOAD    STB   R5,0(R1)         STORE 1ST NON-ZERO & SUBSEQUENT BYTE MOS00920
00B0   D351 0000                       93          LB    R5,0(R1)         RELOAD DATA BYTE TO                 MOS00930
00B4   0765                            94          XAR   R6,R5            GENERATE CHKSUM                     MOS00940
00B6   9481                            95          EXBR  R8,R1                                                MOS00950
00B8   9828                            96          WHR   R2,R8            DISPLAY MEMORY ADDRESS              MOS00960
00BA   9D45                            97          SSR   R4,R5                                                MOS00970
00BC   2091                            98          BTBS  9,1              DU,BSY                              MOS00980
00BE   9B45                            99          RDR   R4,R5                                                MOS00990
00C0   C110 00AC                      100          BXLE  R1,LOAD          LOAD TILL LAST BYTE                 MOS01000
00C4   9486                           101          EXBR  R8,R6                                                MOS01010
00C6   9828                           102          WHR   R2,R8            FINAL CHKSUM                        MOS01020
00C8   2478                           103  LDWT    LIS   R7,8                                                 MOS01030
00CA   917C                           104          SLLS  R7,12            R7 = X'8000'                        MOS01040
00CC   9557                           105          EPSR  R5,R7            HALT PROCESSOR.                     MOS01050
00CE   2203                           106          BS    LDWT                                                 MOS01060
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
00D0                        108          ORG   X'100'              *                                  ***   MOS01080
0100   4300 011E            109  ORIGIN1 B     START2              START HERE FOR 16-BIT PROCESSOR            MOS01090
                            110  *                                                                        MOS01100
                            111  *-----------------------------                                          MOS01110
                            112  *   TEST CONSTANTS                          *                            MOS01120
                            113  *                                                                        MOS01130
0104   0000                 114  FIRST    DCX   0                   *                                  ***   MOS01140
0106   70F0                 115  PSW      DCX   70F0                                                       MOS01150
0108   30F0                 116  PSW2     DCX   30F0                                                       MOS01160
010A   0000                 117  IOSAVE   DCX   0                                                        MOS01170
010C   0000                 118  TEMP     DCX   0                                                        MOS01180
010E   80                   119  NORM     DB    X'80'                                                    MOS01190
010F   40                   120  INCR     DB    X'40'                                                    MOS01200
                            121  *                                                                        MOS01210
                            122  *                                                                        MOS01220
0110   0202                 123  IO       DC    X'0202'             I/O DEVICE(S) IDENTIFIER               MOS01230
0112   1011                 124  PASLADR  DC    X'1011'             PASLA/PALM READ/WRITE ADDRESSES        MOS01240
0114   0202                 125  CLIFADR  DC    X'0202'             CURRENT LOOP INTERFACE R/W ADDRESSES   MOS01250
0116   6262                 126  LPADR    DC    X'6262'             LINE PRINTER ADDRESS                   MOS01260
0118   1011                 127  C300ADR  DC    X'1011'             CAROUSEL 300/PASLA ADDRESSES           MOS01270
011A   C0C0                 128  MICROBUS DC    X'C0C0'             MICROBUS ADDRESS                       MOS01280
011C   0000                 129          DCX   0                   PROVISION FOR SPECIAL DEVICE           MOS01290
                            130  *                                                                        MOS01300
                            131  * IO =   0101  FOR CRT ON PASLA                                         MOS01310
                            132  *        0202  FOR TELETYPE, CAROUSEL 15/30                             MOS01320
                            133  *        XX03  FOR LINE PRINTER                                         MOS01330
                            134  *        0404  FOR CAROUSEL 300                                         MOS01340
                            135  *        0505  FOR MICROBUS                                             MOS01350
                            136  *                                                                        MOS01360
                            137  *                                                                        MOS01370
                            138  *-----------------------------                                          MOS01380
                            139  *                                                                        MOS01390
011E   4810 0108            140  START2   LH    R1,PSW2             *                                  ***   MOS01400
0122   C820 0132            141  ST       LHI   R2,START            *                                  ***   MOS01410
0126   4010 0034            142           STH   R1,X'34'                                                   MOS01420
012A   4020 0036            143           STH   R2,X'36'            II INT NEW PSW LOC                     MOS01430
012E   0000                 144           DCX   0                   TAKE AN ILLEGAL INSTRUCTION INT        MOS01440
0130   2200                 145           BS    *                   HALT IF II INTERRUPT NOT TAKEN         MOS01450
                            146  *                                                                        MOS01460
0132   D310 0110            147  START    LB    R1,IO               GET I/O IDENTIFIERS                    MOS01470
0136   D320 0111            148           LB    R2,IO+1                                                    MOS01480
013A   2436                 149           LIS   R3,6                IDENTIFIER CAN BE 1,2,3,4,5            MOS01490
013C   0513                 150           CLAR  R1,R3                                                      MOS01500
013E   2182                 151           BLS   IO.OK1              BRANCH IF KB IDENTIFIER OK             MOS01510
0140   2412                 152           LIS   R1,2                OTHERWISE FORCE IT TO BE TTY           MOS01520
0142   0523                 153  IO.OK1   CLAR  R2,R3                                                      MOS01530
0144   2182                 154           BLS   IO.OK2              SAME TEST FOR LIST DEVICE              MOS01540
0146   2422                 155           LIS   R2,2                                                       MOS01550
0148   D210 0110            156  IO.OK2   STB   R1,IO               REESTABLISH VALUES                     MOS01560
014C   D220 0111            157           STB   R2,IO+1                                                    MOS01570
0150   D362 0A94            158           LB    R6,CONRQ2S(R2)                                             MOS01580
0154   4060 0A78            159           STH   R6,PASFLG2          SET PASLA FLAG (LIST DEVICE)           MOS01590
0158   0866                 160           LDAR  R6,R6                                                      MOS01600
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
015A  2336           161          BZS   IO.OK3            SKIP IF NOT PASLA                        MOS01610
015C  9121           162          SLHLS R2,1                                                         MOS01620
015E  D302 0111      163          LB    R0,IO+1(R2)                                                  MOS01630
0162  DE02 0A88      164          OC    R0,CON2ND(R2)       ISSUE 2ND COMMAND (LIST DEVICE)  ***    MOS01640
                     165  *                                                                          MOS01650
0166  41F0 0978      166  IO.OK3  BAL   LINK,SETKB          ESTABLISH KEYBOARD DEVICE                MOS01660
016A  9310           167          LBR   R1,R0               (R1) = 1,2,4,5                           MOS01670
016C  9111           168          SLHLS R1,1                (R1) = 2,4,6,A                           MOS01680
016E  4831 0110      169          LH    R3,IO(R1)                                                    MOS01690
0172  4030 0A7A      170          STH   R3,CONADR           SET UP CONSOLE DEVICE ADDRESS            MOS01700
0176  4821 0A7C      171          LH    R2,CONRD(R1)                                                 MOS01710
017A  4020 0A7C      172          STH   R2,CONRD            SET UP R/W COMMANDS                      MOS01720
017E  4821 0A88      173          LH    R2,CON2ND(R1)                                                MOS01730
0182  4020 0A88      174          STH   R2,CON2ND           2ND CMD; ENABLE READ CMD                 MOS01740
0186  9011           175          SRHLS R1,1                                                         MOS01750
0188  D341 0A94      176          LB    R4,CONRQ2S(R1)                                               MOS01760
018C  D240 0A94      177          STB   R4,CONRQ2S          CONSOLE REQUEST TO SEND                  MOS01770
0190  4040 0A76      178          STH   R4,PASFLG           SET PASLA FLAG (CONSOLE)                 MOS01780
0194  9333           179          LBR   R3,R3               MASK CONSOLE DEVICE TO 8 BITS    ****    MOS01790
0196  0844           180          LDAR  R4,R4                                                        MOS01800
0198  2333           181          BZS   IO.OK4              SKIP 2ND OC IF NOT PASLA                 MOS01810
019A  9422           182          EXBR  R2,R2                                                        MOS01820
019C  9E32           183          OCR   R3,R2               ISSUE 2ND COMMAND (CONSOLE)              MOS01830
019E  DE30 0A7C      184  IO.OK4  OC    R3,CONRD            PUT CONSOLE IN READ MODE                 MOS01840
01A2  9B3F           185          RDR   R3,R15              READ A DUMMY CHARACTER (SET BUSY)        MOS01850
                     186  *                                                                          MOS01860
01A4  41F0 09BA      187          BAL   LINK,LCORE          SET UP LOW CORE                          MOS01870
01A8  2400           188          LIS   R0,0                                                         MOS01880
01AA  4000 0AA2      189          STH   R0,WASDU            RESET 'DEVICE UNAVAILABLE' FLAGS         MOS01890
01AE  4000 0AA4      190          STH   R0,WASDU1                                                    MOS01900
01B2  41F0 07DA      191          BAL   LINK,CRLF                                                    MOS01910
01B6  C850 0BF2      192          LHI   R5,TITLE                                                     MOS01920
01BA  41F0 0752      193          BAL   R15,PRINT           PRINT TEST PROGRAM TITLE                 MOS01930
                     194  *---------------------------                                               MOS01940
                     195  *  KEYBOARD INPUT ROUTINE                                                  MOS01950
                     196  *                                                                          MOS01960
01BE  C8F0 0A38      197  OPTIN   LHI   LINK,MM             *                                ***     MOS01970
01C2  40F0 003E      198          STH   LINK,X'3E'          RESTORE ETPE MM POINTER          ***     MOS01980
01C6  41F0 07DA      199          BAL   LINK,CRLF           CR,LF TO LIST DEVICE                     MOS01990
01CA  4820 0108      200  OPTIN1  LH    R2,PSW2                                                      MOS02000
01CE  9512           201          EPSR  R1,R2               NO INT. REG SET 15                       MOS02010
01D0  41F0 0978      202          BAL   LINK,SETKB          ESTABLISH CONSOLE                        MOS02020
01D4  D340 0B28      203          LB    R4,AMSG             OUTPUT AN * TO INDICATE                  MOS02030
01D8  41F0 07E8      204          BAL   LINK,OUTCHR         COMMAND MODE ESTABLISHED                 MOS02040
01DC  2541           205          LCS   R4,1                X'FF'                                    MOS02050
01DE  41F0 07E8      206          BAL   LINK,OUTCHR                                                  MOS02060
01E2  C8C0 08A4      207          LHI   R12,QUESTN          SET UP R12 FOR ERR ROUTINE               MOS02070
01E6  C800 2020      208          LHI   R0,X'2020'          BLANK OUT COMMAND BUFFER                 MOS02080
01EA  4000 177A      209          STH   R0,OPTBUF           WHICH WILL CONTAIN OPTION                MOS02090
01EE  4000 177C      210          STH   R0,OPTBUF+2         NAME                                     MOS02100
01F2  4000 177E      211          STH   R0,OPTBUF+4                                                  MOS02110
01F6  2410           212          LIS   R1,0                CLEAR OPTBUF INDEX                       MOS02120
01F8  41F0 0876      213  RDCHR   BAL   R15,GETCHR          GET A CHAR IN R4                         MOS02130
```

```
01FC  C540 0060          214           CLHI  R4,X'60'          UPPER CASE ALPHA ?                    MOS02140
0200  2183               215           BLS   RDCHAR0           BRANCH IF NO.                         MOS02150
0202  CB40 0020          216           SHI   R4,X'20'          CONVERT TO LOWER CASE                 MOS02160
0206  C540 0023          217  RDCHAR0  CLHI  R4,X'23'          IS IT HASH MARK ?                     MOS02170
020A  4330 01BE          218           BE    OPTIN                                                   MOS02180
020E  C540 005F          219           CLHI  R4,X'5F'          LEFT ARROW, UNDERLINE OR DELETE ?     MOS02190
0212  2334               220           BES   RDCHAR1           YES, BRANCH                           MOS02200
0214  C540 0008          221           CLHI  R4,X'08'          BACK SPACE ?                          MOS02210
0218  2139               222           BNES  RDCHR1            NO, BRANCH                            MOS02220
021A  2711               223  RDCHAR1  SIS   R1,1              YES, DECREMENT INDEX                  MOS02230
021C  021C               224           BMR   R12               BUFFER UNDERFLOW; PRINT '?'           MOS02240
021E  C800 0020          225           LHI   R0,X'20'                                                MOS02250
0222  D201 177A          226           STB   R0,OPTBUF(R1)                                           MOS02260
0226  4300 01F8          227           B     RDCHR                                                   MOS02270
022A  C540 000D          228  RDCHR1   CLHI  R4,X'0D'          IS IT CR ?                            MOS02280
022E  233C               229           BES   LOOKUP            YES, TRY MATCH                        MOS02290
0230  C540 0020          230           CLHI  R4,X'20'          IS IT A BLANK?                        MOS02300
0234  2339               231           BES   LOOKUP            YES, TRY MATCH                        MOS02310
0236  C510 0006          232           CLHI  R1,6              7 CHARACTERS INPUT ?                  MOS02320
023A  038C               233           BNLR  R12               IF YES, ERROR                         MOS02330
023C  D241 177A          234           STB   R4,OPTBUF(R1)     STORE CURRENT BYTE                    MOS02340
0240  2611               235           AIS   R1,1              BUMP BUFFER INDEX                     MOS02350
0242  4300 01F8          236           B     RDCHR             READ NEXT CHARACTER                   MOS02360
                         237  *---------------------------------                                     MOS02370
                         238  *  OPTION MATCH ROUTINE                                               MOS02380
                         239  *                                                                       MOS02390
0246  C810 0B2A          240  LOOKUP   LHI   R1,OPT            LOAD ADDRESS OF OPTION TABLE          MOS02400
024A  2430               241  LOOK1    LIS   R3,0              CLEAR BUFFER INDEX                    MOS02410
024C  0861               242           LDAR  R6,R1             SET OPTION WORD INDEX                 MOS02420
024E  4856 0000          243  LOOK2    LH    R5,0(R6)                                                MOS02430
0252  021C               244           BMR   R12               IF MINUS, THEN NO MATCH = ERROR       MOS02440
0254  4553 177A          245           CLH   R5,OPTBUF(R3)     COMPARE TO OPTBUF HW                  MOS02450
0258  2333               246           BES   LOOK3                                                   MOS02460
025A  261C               247           AIS   R1,12                                                   MOS02470
025C  2209               248           BS    LOOK1                                                   MOS02480
025E  2632               249  LOOK3    AIS   R3,2              TRY NEXT HW                           MOS02490
0260  2662               250           AIS   R6,2                                                    MOS02500
0262  C530 0006          251           CLHI  R3,6              3 MATCHING HW FOUND ?                 MOS02510
0266  208C               252           BLS   LOOK2                                                   MOS02520
                         253  *                                                                       MOS02530
0268  C510 0BA2          254           CLHI  R1,RUN            RUN COMMAND ?                         MOS02540
026C  4330 03E6          255           BE    RUNIT                                                   MOS02550
0270  C510 0B96          256           CLHI  R1,OPTION         OPTION CMD ?                          MOS02560
0274  4230 0386          257           BNE   LOOK4             NO, LOOK FURTHER                      MOS02570
                         258  *---------------------------                                           MOS02580
                         259  *  TO PROCESS INPUT COMMAND 'OPTION'                                   MOS02590
                         260  *                                                                       MOS02600
0278  C540 000D          261           CLHI  R4,X'0D'          CR ?                                  MOS02610
027C  233C               262           BES   OPTEXX            YES, BRANCH                           MOS02620
027E  41E0 067E          263           BAL   R14,OPTVAL        NO, GET OPTION DEV PRINTOUT NO.       MOS02630
0282  C560 0006          264           CLHI  R6,6              IS DEVICE NO. VALID ?                 MOS02640
0286  2387               265           BNLS  OPTEXX            NO, BRANCH                            MOS02650
0288  C840 000A          266           LHI   R4,X'0A'          YES, LOAD A LF CHARACTER              MOS02660
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
028C  41F0 07E8          267           BAL   LINK,OUTCHR        WRITE IT TO THE CONSOLE              MOS02670
0290  D260 010B          268           STB   R6,IOSAVE+1        CHANGE THE LIST DEVICE NO.           MOS02680
0294  4820 0B9E          269  OPTEXX   LH    R2,OPTION+8        CHECK FOR SPECIAL ROUTINE            MOS02690
0298  0232               270           BNZR  R2                 LINK TO ROUTINE                      MOS02700
                         271  *                                                                       MOS02710
029A  C830 0B2A          272  OPTRTN   LHI   R3,TEST            RETURN HERE                          MOS02720
029E  C8E0 0324          273           LHI   R14,OPTCMD8                                              MOS02730
02A2  41F0 07DA          274           BAL   LINK,CRLF                                                MOS02740
02A6  2420               275  OPTCMD   LIS   R2,0               RESET COUNTER                        MOS02750
02A8  D342 0B2A          276  OPTCMD1  LB    R4,OPT(R2)         TO PRINT TEST                        MOS02760
02AC  41F0 07E8          277           BAL   LINK,OUTCHR                                              MOS02770
02B0  2621               278           AIS   R2,1                                                     MOS02780
02B2  C520 0006          279           CLHI  R2,6                                                     MOS02790
02B6  2087               280           BLS   OPTCMD1                                                  MOS02800
02B8  C840 0020          281           LHI   R4,C' '                                                  MOS02810
02BC  41F0 07E8          282           BAL   LINK,OUTCHR        OUTPUT 1 SPACE                       MOS02820
02C0  2450               283           LIS   R5,0               TO PRINT SELECTED TEST NUMBERS       MOS02830
02C2  4050 0104          284           STH   R5,FIRST                                                 MOS02840
02C6  4823 0006          285           LH    R2,6(R3)           FIRST TEST WORD                      MOS02850
02CA  2440               286  OPTCMD2  LIS   R4,0               START WITH TEST 0                    MOS02860
02CC  4040 010C          287           STH   R4,TEMP                                                  MOS02870
02D0  9121               288  OPTCMD3  SLHLS R2,1                                                     MOS02880
02D2  4380 0304          289           BNC   OPTCMD7                                                  MOS02890
02D6  4040 010C          290  OPTCMD4  STH   R4,TEMP            OPTION VALUE FOUND.                  MOS02900
02DA  4800 0104          291           LH    R0,FIRST           IS IT FIRST ?                        MOS02910
02DE  2335               292           BZS   OPTCMD5                                                  MOS02920
02E0  C840 002C          293           LHI   R4,C','            NO, OUTPUT COMMA                     MOS02930
02E4  41F0 07E8          294           BAL   LINK,OUTCHR                                              MOS02940
02E8  40F0 0104          295  OPTCMD5  STH   LINK,FIRST                                               MOS02950
02EC  0855               296           LDAR  R5,R5              TEST VALUE FROM SECOND HW            MOS02960
02EE  2335               297           BZS   OPTCMD6            NO                                   MOS02970
02F0  C840 0031          298           LHI   R4,C'1'            YES,OUTPUT '1'                       MOS02980
02F4  41F0 07E8          299           BAL   LINK,OUTCHR                                              MOS02990
02F8  4840 010C          300  OPTCMD6  LH    R4,TEMP            RESTORE R4                           MOS03000
02FC  D344 0AC4          301           LB    R4,HEXTAB(R4)      CONVERT                              MOS03010
0300  41F0 07E8          302           BAL   LINK,OUTCHR        OUTPUT 0-F                           MOS03020
0304  4840 010C          303  OPTCMD7  LH    R4,TEMP            RESTORE                              MOS03030
0308  2641               304           AIS   R4,1               INCREMENT TEST #                     MOS03040
030A  4040 010C          305           STH   R4,TEMP                                                  MOS03050
030E  C540 0010          306           CLHI  R4,16                                                    MOS03060
0312  4280 02D0          307           BL    OPTCMD3                                                  MOS03070
0316  0855               308  OPTCMD71 LDAR  R5,R5              DONE ?                               MOS03080
0318  023E               309           BNZR  R14                                                      MOS03090
031A  4823 0008          310           LH    R2,8(R3)           SECOND TEST WORD                     MOS03100
031E  2451               311           LIS   R5,1               R5 = 1 FOR SECOND TEST HW            MOS03110
0320  4300 02CA          312           B     OPTCMD2                                                  MOS03120
                         313  *---------------------------------                                      MOS03130
                         314  *  TO OUTPUT OTHER OPTION NAMES & VALUES                                MOS03140
                         315  *                                                                       MOS03150
0324  41F0 07DA          316  OPTCMD8  BAL   LINK,CRLF                                                MOS03160
0328  2461               317           LIS   R6,1               SET LINE COUNTER                     MOS03170
032A  C820 0B36          318           LHI   R2,OPT+12          R2 POINTS TO THE NAME                MOS03180
032E  2436               319  OPTCMD9  LIS   R3,5                                                     MOS03190
```

```
0330  D342 0000          320 OPTCMD10 LB    R4,0(R2)                                          MOS03200
0334  41F0 07E8          321          BAL   LINK,OUTCHR        OUTPUT OPTION NAME CHAR          MOS03210
0338  2621               322          AIS   R2,1                                             MOS03220
033A  2731               323          SIS   R3,1              6 CHARACTERS OUTPUT ?            MOS03230
033C  2026               324          BPS   OPTCMD10          NO,LOOP                          MOS03240
033E  C840 0020          325          LHI   R4,C' '                                          MOS03250
0342  41F0 07E8          326          BAL   LINK,OUTCHR        OUTPUT ONE SPACE                 MOS03260
0346  4852 0000          327          LH    R5,0(R2)          R5 = OPTION VALUE                MOS03270
034A  2404               328          LIS   R0,4                                             MOS03280
034C  41F0 06C8          329          BAL   LINK,R5HEX        WRITE OPTION VALUE IN HEX (4 DIGITS) MOS03290
0350  D300 0110          330          LB    R0,IO                                            MOS03300
0354  2701               331          SIS   R0,1              CONSOLE = CRT ?                  MOS03310
0356  213D               332          BNZS  OPTCMD12          BRANCH: NO.                      MOS03320
0358  2661               333          AIS   R6,1              INCREMENT LINE COUNTER.          MOS03330
035A  C560 0014          334          CLHI  R6,20             PAGE FULL ?                      MOS03340
035E  2189               335          BLS   OPTCMD12          NO, BRANCH                       MOS03350
0360  2460               336          LIS   R6,0              YES, INITIALIZE LINE COUNT       MOS03360
0362  41F0 0876          337 OPTCMD11 BAL   LINK,GETCHR                                       MOS03370
0366  274D               338          SIS   R4,13             CR ?                             MOS03380
0368  4330 01BE          339          BZ    OPTIN             NO, ACCEPT NEXT COMMAND          MOS03390
036C  2643               340          AIS   R4,3              LF ?                             MOS03400
036E  2036               341          BNZS  OPTCMD11          YES, GO PRINT NEXT PAGE          MOS03410
0370  41F0 07DA          342 OPTCMD12 BAL   LINK,CRLF         NO, CRLF                         MOS03420
0374  41F0 08BE          343          BAL   LINK,TSTBRK        EXIT IF 'BREAK' PRESSED.         MOS03430
0378  2626               344          AIS   R2,6                                             MOS03440
037A  C520 0B96          345          CLHI  R2,OPTEND2        ALL PRINTING OPTIONS DONE ?      MOS03450
037E  4280 032E          346          BL    OPTCMD9           NO,LOOP FOR NEXT ONE             MOS03460
0382  4300 01CA          347          B     OPTIN1            TO ACCEPT NEXT COMMAND           MOS03470
                         348 *-----------------------------                                   MOS03480
0386  C510 0B2A          349 LOOK4    CLHI  R1,TEST           'TEST' OPTION ?                  MOS03490
038A  4330 03B2          350          BE    TESTOP                                           MOS03500
                         351 *  TO PROCESS COMMANDS OTHER THAN 'TEST', 'OPTION'.              MOS03510
                         352 *                                                                MOS03520
038E  274D               353          SIS   R4,13             OPT FOLLOWED BY CR ?             MOS03530
0390  033C               354          BZR   R12               YES, ERROR                       MOS03540
0392  41E0 067E          355          BAL   R14,OPTVAL        GET OPTION VALUE IN R6           MOS03550
0396  274D               356          SIS   R4,13             TERMINATED BY CR ?               MOS03560
0398  023C               357          BNZR  R12               IF NO, BRANCH                    MOS03570
039A  48E1 0008          358          LH    R14,8(R1)         GET OPTION CHECK ROUTINE ADDRESS MOS03580
039E  2332               359          BZS   LOOK5                                            MOS03590
03A0  01FE               360          BALR  R15,R14           LINK OPTION CHECK ROUTINE        MOS03600
                         361 *                                RETURN HERE                      MOS03610
03A2  4061 0006          362 LOOK5    STH   R6,6(R1)          STORE OPTION VALUE               MOS03620
03A6  4300 01BE          363          B     OPTIN             ACCEPT NEXT COMMAND              MOS03630
                         364 *                                                                MOS03640
                         365 *-----------------------------------                         *** MOS03650
                         366 *                                                                MOS03660
03AA  4561 000A          367 LEVELIN  CLH   R6,10(R1)          IS R6 > MAX VALUE ?          *** MOS03670
03AE  022C               368          BPR   R12               YES, ERROR RETURN            *** MOS03680
03B0  030F               369          BR    R15               NO, RETURN TO LOOK5          *** MOS03690
                         370 *                                                                MOS03700
                         371 *-----------------------------------                             MOS03710
                         372 *  TEST OPTION PROCESS ROUTINE                                   MOS03720
```

```
                         373  *                                                                  MOS03730
03B2   274D              374  TESTOP   SIS   R4,13            'TEST' FOLLOWED BY (CR) ?         MOS03740
03B4   2137              375           BNZS  TSTOP1                                             MOS03750
03B6   4800 0C22         376           LH    R0,DEFTESTS      YES, SET TEST OPTION TO           MOS03760
03BA   4000 0B30         377           STH   R0,TEST+6        FIRST TEST WORD                   MOS03770
03BE   4300 01BE         378           B     OPTIN            TO ACCEPT NEXT COMMAND            MOS03780
                         379  *                                                                  MOS03790
03C2   4850 0C24         380  TSTOP1   LH    R5,MAXTST                                         MOS03800
03C6   2470              381           LIS   R7,0             RESET TEST BIT ACCUMULATORS       MOS03810
03C8   2480              382           LIS   R8,0                                               MOS03820
03CA   41E0 067E         383  TSTOP2   BAL   R14,OPTVAL       GET OPTION VALUE IN R6            MOS03830
03CE   0556              384           CLAR  R5,R6                                              MOS03840
03D0   028C              385           BLR   R12              ERROR: INVALID TEST NUMBER        MOS03850
03D2   41E0 06BA         386           BAL   R14,UNARY        GET UNARY OPERAND IN R3           MOS03860
03D6   0673              387           OAR   R7,R3            SET CURRENT BIT                   MOS03870
03D8   274D              388  TSTOP4   SIS   R4,13           TERMINATED BY CR ?                MOS03880
03DA   4230 03CA         389           BNZ   TSTOP2                                             MOS03890
03DE   4070 0B30         390           STH   R7,TEST+6        STORE VALID SELECTED TESTS        MOS03900
03E2   4300 01BE         391           B     OPTIN            TO ACCEPT NEXT COMMAND            MOS03910
                         392  *----------------------------                                     MOS03920
                         393  *                                                                  MOS03930
03E6   41F0 07DA         394  RUNIT    BAL   LINK,CRLF                                         MOS03940
03EA   24F0              395           LIS   R15,0            RESET DU FLAGS                    MOS03950
03EC   40F0 0AA2         396           STH   R15,WASDU                                          MOS03960
03F0   40F0 0AA4         397           STH   R15,WASDU1                                         MOS03970
03F4   240F              398           LIS   R0,15            TO FIND HIGHEST SELECTED TEST NO. MOS03980
03F6   4810 0B30         399           LH    R1,TEST+6        CHECK FIRST TEST HW               MOS03990
03FA   9011              400  KEEP2    SRLS  R1,1                                             MOS04000
03FC   2184              401           BCS   FOUND2           R0 = F-0 = TEST NUMBER            MOS04010
03FE   2701              402           SIS   R0,1                                              MOS04020
0400   2213              403           BNMS  KEEP2            LOOP                              MOS04030
0402   030C              404           BR    R12              TEST NOT SELECTED                 MOS04040
0404   4000 0AA0         405  FOUND2   STH   R0,SELTST        HIGHEST SELECTED TEST NUMBER  ***  MOS04050
                         406  *                                                                  MOS04060
                         407  *  RESET TEST PARAMETERS                                         MOS04070
                         408  *                                                                  MOS04080
0408   4800 0110         409           LH    R0,IO                                              MOS04090
040C   4000 010A         410           STH   R0,IOSAVE        RESTORE USER'S I/O CHOICE         MOS04100
0410   41F0 07DA         411           BAL   LINK,CRLF                                          MOS04110
0414   41F0 0BB0         412           BAL   LINK,INIT        LINK USER'S INITIALIZATION ROUTINE MOS04120
                         413  *                                                                  MOS04130
0418   2400              414  INITRET  LIS   R0,0             RETURN HERE FROM INIT             MOS04140
041A   4000 0A9C         415           STH   R0,ISITERR       RESET ERROR FLAG                  MOS04150
041E   4000 0AA6         416           STH   R0,TOTAL         RESET TOTAL                       MOS04160
0422   4000 0AA8         417           STH   R0,TOTERR        RESET TOTERR                      MOS04170
0426   4000 0AA2         418           STH   R0,WASDU         RESET WASDU                       MOS04180
042A   C810 3030         419           LHI   R1,C'00'                                           MOS04190
042E   4010 0ADA         420           STH   R1,MTESTNO       RESET THESE FLAGS TO C'00'        MOS04200
0432   4010 0AE4         421           STH   R1,ETESTNO                                         MOS04210
0436   4010 0AE6         422           STH   R1,ERRNO                                           MOS04220
043A   41F0 09BA         423           BAL   LINK,LCORE       SET UP LOW CORE                   MOS04230
                         424  *                                                                  MOS04240
                         425  *  START SELECTION FROM TEST 0                                    MOS04250
```

```
                         426  *                                                                    MOS04260
043E  2400               427  KEEP3    LIS   R0,0                                                 MOS04270
0440  4000 0AAA          428           STH   R0,BTESTNO          RESET BINARY TEST NUMBER           MOS04280
0444  4000 0AAE          429           STH   R0,NEXTST           RESET NEXT TEST NUMBER             MOS04290
                         430  *                                                                    MOS04300
                         431  *  TO FIND THE NEXT SELECTED TEST.                                   MOS04310
                         432  *                                                                    MOS04320
0448  4820 0AAE          433  KEEP4    LH    R2,NEXTST           GET NEXT TEST NUMBER               MOS04330
044C  2408               434  KEEP41   LIS   R0,8                                                 MOS04340
044E  910C               435           SLHLS R0,12               R0 = X'8000'                       MOS04350
0450  CC02 0000          436           SRHL  R0,0(R2)            R0 = NEXT TEST BIT                 MOS04360
0454  4400 0B30          437  KEEP42   NH    R0,TEST+6           LOOK AT TEST HW 1                  MOS04370
0458  2133               438           BNZS  KEEP5                                                  MOS04380
045A  2621               439  KEEP43   AIS   R2,1                                                  MOS04390
045C  2208               440           BS    KEEP41              LOOP FOR NEXT TEST NUMBER          MOS04400
045E  4020 0AAA          441  KEEP5    STH   R2,BTESTNO           CURRENT TEST NUMBER                MOS04410
0462  0812               442           LDAR  R1,R2               R1 = TEST NUMBER IN BINARY         MOS04420
0464  2621               443           AIS   R2,1                                                   MOS04430
0466  4020 0AAE          444           STH   R2,NEXTST                                              MOS04440
046A  2402               445           LIS   R0,2                SET DIGITS TO PRINT = 2            MOS04450
046C  C820 0ADA          446           LHI   R2,MTESTNO          R2 = A(MTESTNO)                    MOS04460
0470  41F0 06F2          447           BAL   LINK,HEXASC         STORE TEST NO. IN ASCII @ MTESTNO  MOS04470
0474  4820 0ADA          448           LH    R2,MTESTNO                                             MOS04480
0478  4020 0AE4          449           STH   R2,ETESTNO          STORE TEST NO. IN ASCII @ ETESTNO  MOS04490
047C  41F0 08BE          450           BAL   LINK,TSTBRK         TEST BREAK                         MOS04500
0480  C850 0AD4          451           LHI   R5,TSTMSG                                              MOS04510
0484  41F0 0752          452           BAL   LINK,PRINT          PRINT 'TEST NN'                    MOS04520
0488  2400               453           LIS   R0,0                                                   MOS04530
048A  4000 0A9E          454           STH   R0,NOERR            RESET ERROR FLAG                   MOS04540
048E  4000 0AAC          455           STH   R0,COUNT            RESET COUNT                        MOS04550
0492  4810 0106          456  KEEP6    LH    R1,PSW              ENABLE INTERRUPTS  (30F0)         MOS04560
0496  9501               457           EPSR  R0,R1                                                  MOS04570
0498  4820 0AAA          458           LH    R2,BTESTNO          R2 = TEST NUMBER                   MOS04580
049C  9121               459           SLLS  R2,LADC                                                MOS04590
049E  4812 0C28          460           LDA   R1,TESTS(R2)                                           MOS04600
04A2  0301               461           BR    R1                  GO TO TEST MODULE                  MOS04610
                         462  *----------------------------                                        MOS04620
                         463  *                                                                    MOS04630
                         464  *  TEST MODULE END ROUTINE                                           MOS04640
                         465  *                                                                    MOS04650
04A4  C8F0 0A38          466  TSTEND   LHI   LINK,MM             *                          ***    MOS04660
04A8  40F0 003E          467           STH   LINK,X'3E'          RESTORE ETPE MM POINTER    ***    MOS04670
04AC  4810 0108          468           LH    R1,PSW2                                                MOS04680
04B0  9501               469           EPSR  R0,R1               DISABLE INT @ PROCESSOR LEVEL      MOS04690
04B2  4800 0AAC          470           LH    R0,COUNT                                               MOS04700
04B6  2601               471           AIS   R0,1                INCREMENT COUNT                    MOS04710
04B8  4000 0AAC          472           STH   R0,COUNT                                               MOS04720
04BC  41F0 08BE          473           BAL   LINK,TSTBRK         IF BREAK GO TO OPTIN       ***    MOS04730
04C0  4500 0B3C          474           CLH   R0,LOOP+6           IF COUNT > LOOP,                   MOS04740
04C4  2383               475           BNLS  KEEP7               GO TO NEXT TEST MODULE             MOS04750
04C6  4300 0492          476           B     KEEP6               OTHERWISE, REPEAT SAME TEST        MOS04760
04CA  4800 0A9E          477  KEEP7    LH    R0,NOERR            LOOK @ ERROR FLAG                  MOS04770
04CE  2135               478           BNZS  KEEP71                                                 MOS04780
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
04D0  C850 0AFA          479          LHI   R5,NOERMSG                                          MOS04790
04D4  41F0 0752          480          BAL   LINK,PRINT          PRINT "NO ERROR"                  MOS04800
04D8  4810 0AAA          481  KEEP71  LH    R1,BTESTNO          GET TEST NUMBER                   MOS04810
04DC  4510 0AA0          482          CLH   R1,SELTST           IS THE LAST SELECTED TEST DONE ?  MOS04820
04E0  4280 0448          483          BL    KEEP4               NO, GO SELECT NEXT TEST           MOS04830
                         484  *                                                                   MOS04840
                         485  *  ALL THE SELECTED TESTS ARE NOW RUN                               MOS04850
                         486  *                                                                   MOS04860
04E4  C8F0 0A38          487  ABORT   LHI   LINK,MM             COME HERE TO ABORT TEST SEQUENCE *** MOS04870
04E8  40F0 003E          488          STH   LINK,X'3E'          RESTORE ETPE MM POINTER          *** MOS04880
04EC  4810 0108          489          LH    R1,PSW2                                             MOS04890
04F0  9501               490          EPSR  R0,R1               PSW = 30F0                        MOS04900
04F2  41F0 05D8          491          BAL   LINK,DISPLAY        DISPLAY TOTAL & TOTERR            MOS04910
04F6  0AA6               492          DC    Z(TOTAL),Z(TOTERR)                                  MOS04920
04F8  0AA8
04FA  41F0 0942          493          BAL   LINK,TSTDU          RETURN WITH R1 = DU BIT           MOS04930
04FE  4230 0560          494          BNZ   KEEP9               IF DU, DISPLAY TOTAL              MOS04940
0502  4810 0AA4          495          LH    R1,WASDU1           WAS IT EVER ?                     MOS04950
0506  4230 0596          496          BNZ   KEEP92              YES, PRINT TOTAL, TOTERR          MOS04960
050A  41F0 08BE          497          BAL   LINK,TSTBRK                                          MOS04970
050E  4810 0B48          498          LH    R1,CONTIN+6         IF CONTIN = 0,                    MOS04980
0512  233E               499          BZS   ABORT3              GO ABORT TEST                *** MOS04990
0514  6110 0AA6          500          AHM   R1,TOTAL            IF TOTAL < MAX               *** MOS05000
0518  4230 043E          501          BNZ   KEEP3               GO TO TEST 0                 *** MOS05010
051C  2511               502          LCS   R1,1                OTHERWISE                    *** MOS05020
051E  6110 0AA6          503          AHM   R1,TOTAL            SET TOTAL TO MAX &           *** MOS05030
0522  4300 0590          504          B     HALT9               HALT PROCESSOR               *** MOS05040
                         505  *                                                                   MOS05050
0526  C8F0 0A38          506  ABORT1  LHI   LINK,MM             *                            *** MOS05060
052A  40F0 003E          507          STH   LINK,X'3E'          RESTORE ETPE MM POINTER      *** MOS05070
                         508  *                                                               *** MOS05080
052E  4810 0108          509  ABORT3  LH    R1,PSW2             *                            *** MOS05090
0532  9501               510          EPSR  R0,R1               SET PSW = X'30F0'            *** MOS05100
0534  41F0 0978          511          BAL   LINK,SETKB          KB DEVICE = LIST DEVICE           MOS05110
0538  C850 0B18          512          LHI   R5,EOTMSG                                             MOS05120
053C  4050 0A9C          513          STH   R5,ISITERR          *                            *** MOS05130
0540  41F0 0752          514          BAL   LINK,PRINT          'END OF TEST'                     MOS05140
0544  24F0               515          LIS   R15,0               *                            *** MOS05150
0546  40F0 0A9C          516          STH   R15,ISITERR         *                            *** MOS05160
                         517  *                                                                   MOS05170
054A  48F0 0B54          518          LH    LINK,NOMSG+6        IF "NOMSG" IS SET TO A 1,         MOS05180
054E  4230 0596          519          BNZ   KEEP92              PRINT "TOTAL" & "TOTERR"          MOS05190
0552  48F0 0B60          520          LH    LINK,SCOPE+6        *                            *** MOS05200
0556  27F4               521          SIS   LINK,4              IF "SCOPE" = 4,              *** MOS05210
0558  4330 0596          522          BZ    KEEP92              PRINT "TOTAL" & "TOTERR"     *** MOS05220
055C  4300 01BE          523          B     OPTIN                                               MOS05230
                         524  *---------------------------------                               MOS05240
                         525  *  ROUTINE INCREMENTS, DISPLAYS & CHECKS 'TOTAL'                    MOS05250
                         526  *                                                                   MOS05260
0560  4010 0AA2          527  KEEP9   STH   R1,WASDU            SET 'WASDU' FLAG                  MOS05270
                         528  *                                                                   MOS05280
0564  4810 0AA6          529  ABORT2  LH    R1,TOTAL            INCREMENT TOTAL                   MOS05290
0568  2611               530          AIS   R1,1                                                  MOS05300
```

```
056A  4010 0AA6          531           STH   R1,TOTAL                                          MOS05310
056E  41F0 05D8          532  KEEP91   BAL   LINK,DISPLAY      DISPLAY "TOTAL" & "TOTERR"       MOS05320
0572  0AA6               533           DC    Z(TOTAL),Z(TOTERR)                                MOS05330
0574  0AA8
0576  4810 0AA6          534           LH    R1,TOTAL                                          MOS05340
057A  C510 7FFF          535           CLHI  R1,X'7FFF'       TOTAL < MAX RETAINABLE ?         MOS05350
057E  2389               536           BNLS  HALT9            NO, BRANCH                       MOS05360
0580  4800 0AAA          537           LH    R0,BTESTNO       R0 = CURRENT TEST NUMBER         MOS05370
0584  4500 0AA0          538           CLH   R0,SELTST        IS IT LAST TEST ?                MOS05380
0588  4280 0448          539           BL    KEEP4            NO, GO TO NEXT TEST              MOS05390
058C  4300 043E          540           B     KEEP3            YES, GO TO TEST 0                MOS05400
                         541  *                                                                 MOS05410
0590  C810 80F0          542  HALT9    LHI   R1,X'80F0'       (R1) = X'80F0'          ***      MOS05420
0594  9521               543           EPSR  R2,R1            HALT PROCESSOR                   MOS05430
                         544  *                                                                 MOS05440
                         545  *  WHEN EXE/RUN IS PRESSED, PRINT TOTAL & TOTERR                  MOS05450
                         546  *                                                                 MOS05460
0596  41F0 0942          547  KEEP92   BAL   LINK,TSTDU        SEE IF LIST DEV IS ON            MOS05470
059A  2035               548           BNZS  HALT9            NO, BRANCH                       MOS05480
059C  2400               549  KEEP10   LIS   R0,0                                               MOS05490
059E  4000 0AA2          550           STH   R0,WASDU         RESET FLAG                       MOS05500
05A2  41F0 07DA          551           BAL   LINK,CRLF                                          MOS05510
05A6  C850 0AEA          552           LHI   R5,TOTMSG                                          MOS05520
05AA  4050 0A9C          553           STH   R5,ISITERR                                         MOS05530
05AE  41F0 0752          554           BAL   LINK,PRINT       PRINT 'TOTAL   TOTERR'           MOS05540
05B2  2404               555           LIS   R0,4             TO PRINT 4 HEX DIGITS            MOS05550
05B4  4850 0AA6          556           LH    R5,TOTAL                                           MOS05560
05B8  41F0 06C8          557           BAL   LINK,R5HEX       PRINT TOTAL IN HEX               MOS05570
05BC  2434               558           LIS   R3,4                                               MOS05580
05BE  C840 0020          559           LHI   R4,C' '          SPACE                            MOS05590
05C2  41F0 07E8          560  KEEP101  BAL   LINK,OUTCHR      OUTPUT IT                        MOS05600
05C6  2731               561           SIS   R3,1                                               MOS05610
05C8  2023               562           BPS   KEEP101          4 TIMES                          MOS05620
05CA  2404               563           LIS   R0,4             TO PRINT 4 HEX DIGITS            MOS05630
05CC  4850 0AA8          564           LH    R5,TOTERR                                          MOS05640
05D0  41F0 06C8          565           BAL   LINK,R5HEX       PRINT TOTERR IN HEX              MOS05650
05D4  4300 01BE          566           B     OPTIN            GO TO BEGINNING                  MOS05660
                         567  *---------------------------------                               MOS05670
                         568  *  DISPLAY DATA ROUTINE                                          MOS05680
05D8  2401               569  DISPLAY  LIS   R0,1             GET DISPLAY PANEL ADDRESS        MOS05690
05DA  DE00 010F          570           OC    R0,INCR          PUT PANEL IN INCREMENTAL MODE    MOS05700
05DE  481F 0002          571           LH    R1,2(LINK)       GET 2ND PARAMETER ADDRESS        MOS05710
05E2  4811 0000          572           LH    R1,0(R1)         GET DATA                         MOS05720
05E6  9411               573           EXBR  R1,R1                                            MOS05730
05E8  9801               574           WHR   R0,R1            WRITE DATA                       MOS05740
05EA  481F 0000          575           LH    R1,0(LINK)       GET 1ST PARAMETER ADDRESS        MOS05750
05EE  4811 0000          576           LH    R1,0(R1)         GET DATA                         MOS05760
05F2  9411               577           EXBR  R1,R1                                            MOS05770
05F4  9801               578           WHR   R0,R1            WRITE DATA                       MOS05780
05F6  DE00 010E          579           OC    R0,NORM          PUT PANEL IN NORMAL MODE         MOS05790
05FA  430F 0004          580           B     4(LINK)          RETURN                           MOS05800
                         581  *---------------------------------                               MOS05810
                         582  *  ERROR ROUTINES               (OVERRIDE NOMSG OPTION)          MOS05820
```

```
                        583  *                                                                    MOS05830
05FE   D000 180C        584  ERR       STM   R0,ERRSAVE       STORE REGISTERS                    MOS05840
0602   4120 061C        585            BAL   R2,ERRCOM        RETURN IF LIST DEVICE IS ON        MOS05850
0606   41E0 0650        586            BAL   RET,ERR1          PRINT 'ERROR TTNN'                 MOS05860
060A   2400             587  ERRCOM2   LIS   R0,0             *                            ***   MOS05870
060C   4000 0A9C        588            STH   R0,ISITERR        RESET ERROR FLAG                   MOS05880
0610   4820 0106        589            LH    R2,PSW                                               MOS05890
0614   9502             590            EPSR  R0,R2                                                MOS05900
0615   D100 180C        591            LM    R0,ERRSAVE        RESTORE REGISTERS                  MOS05910
061A   030F             592            BR    LINK              RETURN TO TEST                     MOS05920
                        593  *                                                                    MOS05930
                        594  *  ETPE COMMON ERROR ROUTINE                                 ***     MOS05940
                        595  *                                                                    MOS05950
061C   4020 0AB2        596  ERRCOM    STH   R2,COMRET                                            MOS05960
0620   4810 0108        597            LH    R1,PSW2                                              MOS05970
0624   9501             598            EPSR  R0,R1             DISABLE INT. @ PROCESSOR LEVEL     MOS05980
0626   41F0 0942        599            BAL   LINK,TSTDU        GET LIST DEVICE DU BIT IN R1       MOS05990
062A   2138             600            BNZS  ERRCOM1           BRANCH IF OFF-LINE                 MOS06000
062C   4020 0A9C        601            STH   R2,ISITERR        SET ERROR FLAG                     MOS06010
0630   4020 0A9E        602            STH   R2,NOERR                                             MOS06020
0634   4820 0AB2        603            LH    R2,COMRET                                            MOS06030
0638   0302             604            BR    R2                GO, PRINT ERROR MESSAGE          MOS06040
                        605  *                                                                    MOS06050
063A   4810 0AA8        606  ERRCOM1   LH    R1,TOTERR         LIST DEVICE IS OFF                 MOS06060
063E   2611             607            AIS   R1,1                                                 MOS06070
0640   4010 0AA8        608            STH   R1,TOTERR         INCREMENT TOTERR                   MOS06080
0644   C510 7FFF        609            CLHI  R1,X'7FFF'        TOTERR < MAX RETAINABLE ?          MOS06090
0648   4280 056E        610            BL    KEEP91            NO, ABORT CURRENT TEST & GOTO NEXT MOS06100
064C   4300 0590        611            B     HALT9             YES, HALT PROCESSOR                MOS06110
                        612  *----------------------------                                        MOS06120
                        613  * MESSAGE PRINT ROUTINES         (DO NOT OVERRIDE NOMSG OPTION)     MOS06130
                        614  *                                                                    MOS06140
                        615  *  TO PRINT 'ERROR TTNN'                                            MOS06150
                        616  *                                                                    MOS06160
0650   C850 0ADE        617  ERR1      LHI   R5,ERRMSG                                            MOS06170
0654   41F0 0752        618            BAL   LINK,PRINT        PRINT 'ERROR TTNN'                 MOS06180
                        619  *                                TT = TEST NO., NN = ERROR NO.      MOS06190
0658   030E             620            BR    RET               RETURN                           MOS06200
                        621  *                                                           ***      MOS06210
                        622  *  TO PRINT 'PSW PPPP  LOC LLLL'                                    MOS06220
                        623  *                                                                    MOS06230
065A   2404             624  ERRPL1    LIS   R0,4              SET UP DIGITS = 4                  MOS06240
065C   4810 0A70        625            LH    R1,OPSW           R1 = OLD PSW                       MOS06250
0660   C820 0B08        626            LHI   R2,ASCIPSW                                           MOS06260
0664   41F0 06F2        627            BAL   LINK,HEXASC       CONVERT IT TO ASCII                MOS06270
0668   4810 0A72        628            LH    R1,OLOC           R1= OLD LOC                        MOS06280
066C   C820 0B12        629            LHI   R2,ASCILOC                                           MOS06290
0670   41F0 06F2        630            BAL   LINK,HEXASC       CONVERT IT TO ASCII                MOS06300
0674   C850 0B04        631            LHI   R5,PSWMSG                                            MOS06310
0678   41F0 0752        632            BAL   LINK,PRINT        PRINT 'PSW PPPP  LOC LLLL'         MOS06320
067C   030E             633            BR    RET               RETURN                           MOS06330
                        634  * ********************************                                   MOS06340
                        635  *  TO OBTAIN OPTION VALUE IN R6    (16 BITS, TARGT 16)               MOS06350
```

```
                        636  *                                                                    MOS06360
067E   2460             637  OPTVAL   LIS   R6,0              INITIALIZE ACCUMULATOR          MOS06370
0680   41F0 0876        638           BAL   R15,GETCHR         GET A CHAR IN R4                MOS06380
0684   24FF             639  OPTVAL0  LIS   R15,15                                            MOS06390
0686   D44F 0AC4        640  OPTVAL1  CLB   R4,HEXTAB(R15)     SCAN TABLE                      MOS06400
068A   2334             641           BES   OPTVAL2           MATCH                           MOS06410
068C   27F1             642           SIS   R15,1                                             MOS06420
068E   2214             643           BNMS  OPTVAL1                                          MOS06430
0690   030C             644           BR    R12               ERROR; VALUE NOT IN TABLE.      MOS06440
0692   9164             645  OPTVAL2  SLLS  R6,4               SHIFT LEFT 4                    MOS06450
0694   066F             646           OAR   R6,R15             OR IN CURRENT DIGIT             MOS06460
0696   41F0 0876        647  OPTVAL3  BAL   R15,GETCHR         GET NEXT CHAR                   MOS06470
069A   C540 005F        648           CLHI  R4,X'5F'           IS IT LEFT ARROW ?              MOS06480
069E   2334             649           BES   OPTVAL5           YES, BRANCH                     MOS06490
06A0   C540 0008        650           CLHI  R4,X'08'           BACK SPACE ?                    MOS06500
06A4   2133             651           BNES  OPTVAL4           NO, BRANCH                      MOS06510
06A6   9064             652  OPTVAL5  SRLS  R6,4               YES, THROW AWAY LAST HEX ENTRY  MOS06520
06A8   2209             653           BS    OPTVAL3                                          MOS06530
06AA   C540 000D        654  OPTVAL4  CLHI  R4,13              EXIT IF CR                      MOS06540
06AE   033E             655           BER   R14                                              MOS06550
06B0   C540 002C        656           CLHI  R4,X'2C'           OR COMMA                        MOS06560
06B4   4230 0684        657           BNE   OPTVAL0            LOOP TO PROCESS                 MOS06570
06B8   030E             658           BR    R14                RETURN                          MOS06580
                        659  *---------------------------------                                 MOS06590
                        660  * TO CONVERT (R6) FROM BINARY TO UNARY PATTERN, IN R3               MOS06600
                        661  *                                                                    MOS06610
06BA   2431             662  UNARY    LIS   R3,1               INITIALIZE                      MOS06620
06BC   C560 000F        663  UNARY1   CLHI  R6,15              DONE ?                          MOS06630
06C0   033E             664           BER   R14                RETURN                          MOS06640
06C2   0A33             665           AAR   R3,R3              NO. SHIFT R3.                   MOS06650
06C4   2661             666           AIS   R6,1               INCREMENT COUNTER               MOS06660
06C6   2205             667           BS    UNARY1                                           MOS06670
                        668  *-----------------------------                                  ***  MOS06680
                        669  *  R5HEX PRINTS CONTENTS OF R5 IN HEX                            MOS06690
                        670  *        PRINTS UPTO 4 DIGITS      (8 DIGITS, TARGT 32)            MOS06700
                        671  *                                                                    MOS06710
06C8   D000 17CC        672  R5HEX    STM   R0,RSAVE           STORE REGISTERS                 MOS06720
06CC   0820             673           LDAR  R2,R0              R2 = NO. OF DIGITS TO BE PRINTED MOS06730
06CE   2721             674           SIS   R2,1                                               MOS06740
06D0   4210 06EC        675           BM    R5XB                                               MOS06750
06D4   9122             676           SLLS  R2,2               R2 = 4(DIGITS-1)                MOS06760
06D6   0845             677  R5X      LDAR  R4,R5                                              MOS06770
06D8   CC42 0000        678           SRAL  R4,0(R2)                                           MOS06780
06DC   C440 000F        679           NHI   R4,15              R4 = HEX DIGIT                  MOS06790
06E0   D344 0AC4        680           LB    R4,HEXTAB(R4)                                      MOS06800
06E4   41F0 07E8        681  R5XA     BAL   R15,OUTCHR                                         MOS06810
06E8   2724             682           SIS   R2,4                                               MOS06820
06EA   221A             683           BNMS  R5X                LOOP TILL ALL DIGITS            MOS06830
06EC   D100 17CC        684  R5XB     LM    R0,RSAVE           RESTORE REGISTERS               MOS06840
06F0   030F             685           BR    LINK               RETURN                          MOS06850
                        686  *-----------------------------                                  ***  MOS06860
                        687  *  TO CONVERT HEXADECIMAL DATA IN R1 TO ASCII CHAR & STORE @ 0(R2) MOS06870
                        688  *                                                                    MOS06880
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
06F2  D000 17CC        689  HEXASC   STM   R0,RSAVE          STORE REGISTERS                        MOS06890
06F6  0830             690           LDAR  R3,R0             R3 = DIGITS                            MOS06900
06F8  9132             691           SLLS  R3,2                                                     MOS06910
06FA  2734             692           SIS   R3,4              R3 = 4(DIGITS)-4                       MOS06920
06FC  0841             693  HEXASC1  LDAR  R4,R1             R4 = HEX DATA                          MOS06930
06FE  CC43 0000        694           SRAL  R4,0(R3)                                                 MOS06940
0702  C440 000F        695           NHI   R4,15             R4 = HEX DIGIT TO BE CONVERTED         MOS06950
0706  D344 0AC4        696           LB    R4,HEXTAB(R4)                                            MOS06960
070A  D242 0000        697           STB   R4,0(R2)          STORE ASCII CHAR                       MOS06970
070E  2621             698           AIS   R2,1                                                     MOS06980
0710  2734             699           SIS   R3,4                                                     MOS06990
0712  221B             700           BNMS  HEXASC1           LOOP TILL ALL DIGITS                   MOS07000
0714  D100 17CC        701           LM    R0,RSAVE          RESTORE REGISTERS                      MOS07010
0718  030F             702           BR    LINK              RETURN                                 MOS07020
                       703  *-----------------------------                                          MOS07030
                       704  *  TO CONVERT BINARY DATA IN R1 INTO DECIMAL DIGITS                     MOS07040
                       705  *     AND STORE THEM IN ASCII @ 0(R2)                                   MOS07050
                       706  *                                                                        MOS07060
071A  D000 17CC        707  DECASC   STM   R0,RSAVE                                                 MOS07070
071E  0830             708           LDAR  R3,R0             COPY DIGIT COUNT                       MOS07080
0720  9131             709           SLLS  R3,LADC           & ESTABLISH DECTAB INDEX.              MOS07090
0722  2732             710           SIS   R3,ADC                                                   MOS07100
0724  2440             711  $DEC1    LIS   R4,0              CLEAR MODULUS COUNTER                  MOS07110
0726  4853 0ABA        712           LDA   R5,DECTAB(R3)     LOAD LARGEST REQ. POWER OF 10.         MOS07120
072A  0515             713  $DEC2    CLAR  R1,R5             EXCEEDS TEST VALUE ?                   MOS07130
072C  2188             714           BLS   $DEC3             BRANCH IF YES.                         MOS07140
072E  0B15             715           SAR   R1,R5             DECREMENT TEST VALUE                   MOS07150
0730  2641             716           AIS   R4,1              INCREMENT MODULUS COUNTER              MOS07160
0732  C540 000A        717           CLHI  R4,10             VALID DECIMAL DIGIT ?                  MOS07170
0736  2086             718           BLS   $DEC2             BRANCH IF YES; ELSE                    MOS07180
0738  274A             719           SIS   R4,10             FORCE VALID DIGIT,                     MOS07190
073A  2208             720           BS    $DEC2             REPEAT DECREMENT.                      MOS07200
073C  D344 0AC4        721  $DEC3    LB    R4,HEXTAB(R4)     CONVERT MODULUS COUNT TO ASCII         MOS07210
0740  D242 0000        722           STB   R4,0(R2)          AND STORE AT DESTINATION MSB.          MOS07220
0744  2621             723           AIS   R2,1              INCREMENT DESTINATION POINTER          MOS07230
0746  2732             724           SIS   R3,ADC            DECREMENT DECTAB POINTER               MOS07240
0748  4310 0724        725           BNM   $DEC1             FALL THROUGH ON DECTAB UNDERFLOW.      MOS07250
074C  D100 17CC        726           LM    R0,RSAVE          RESTORE USER'S REGISTERS               MOS07260
0750  030F             727           BR    LINK              RETURN.                                MOS07270
                       728  *-----------------------------                                          MOS07280
                       729  *  TO PRINT THE ASCII MESSAGE                                          MOS07290
                       730  *                                                                        MOS07300
0752  D000 17CC        731  PRINT    STM   R0,RSAVE          STORE REGISTERS                        MOS07310
0756  41F0 0942        732           BAL   LINK,TSTDU                                               MOS07320
075A  2337             733           BZS   P1                                                       MOS07330
075C  4010 0AA2        734           STH   R1,WASDU          SET DU FLAGS                           MOS07340
0760  4010 0AA4        735           STH   R1,WASDU1                                                MOS07350
0764  4300 07D0        736           B     PRINT5            EXIT                                   MOS07360
0768  4820 0AA2        737  P1       LH    R2,WASDU                                                 MOS07370
076C  4330 079A        738           BZ    P3                                                       MOS07380
0770  C810 0140        739           LHI   R1,X'140'         DELAY CONSTANT                         MOS07390
0774  C800 1000        740  P4       LHI   R0,X'1000'                                               MOS07400
0778  2701             741  P5       SIS   R0,1                                                     MOS07410
```

```
077A  2031          742          BNZS  P5                                    MOS07420
077C  2711          743          SIS   R1,1                                  MOS07430
077E  2035          744          BNZS  P4              LOOP TILL TIMEOUT       MOS07440
                    745  *                             (20 SEC FOR CRT WARM-UP) MOS07450
0780  2440          746          LIS   R4,0                                   MOS07460
0782  4040 0AA2     747          STH   R4,WASDU                               MOS07470
0786  2541          748          LCS   R4,1             CHARACTER = X'FF'     MOS07480
0788  4040 0AA4     749          STH   R4,WASDU1                              MOS07490
078C  2434          750          LIS   R3,4                                   MOS07500
078E  41F0 07E8     751  P2      BAL   LINK,OUTCHR                            MOS07510
0792  2731          752          SIS   R3,1                                   MOS07520
0794  2023          753          BPS   P2                                    MOS07530
0796  4300 059C     754          B     KEEP10           PRINT TOTAL, TOTERR   MOS07540
079A  4800 0B54     755  P3      LH    R0,NOMSG+6                             MOS07550
079E  2335          756          BZS   PRINT2           NO, PRINT ALL MESSAGES MOS07560
07A0  4800 0A9C     757          LH    R0,ISITERR                             MOS07570
07A4  4330 07D0     758          BZ    PRINT5           NOT AN ERROR MSG. EXIT MOS07580
                    759  *                                                    MOS07590
07A8  D345 0000     760  PRINT2  LB    R4,0(R5)         GET A MESSAGE BYTE    MOS07600
07AC  41F0 07E8     761          BAL   LINK,OUTCHR      OUTPUT IT             MOS07610
07B0  274D          762          SIS   R4,13            CR ?                  MOS07620
07B2  2333          763          BZS   PRINT3           MSG OVER              MOS07630
07B4  2651          764          AIS   R5,1                                   MOS07640
07B6  2207          765          BS    PRINT2           LOOP FOR NEXT CHAR    MOS07650
07B8  244A          766  PRINT3  LIS   R4,10            LF                    MOS07660
07BA  D310 010B     767          LB    R1,IOSAVE+1      GET LIST DEV IDENTIFIER MOS07670
07BE  2713          768          SIS   R1,3             LINE PRINTER ?        MOS07680
07C0  2335          769          BZS   PRINT3A          BRANCH IF YES.        MOS07690
07C2  41F0 07E8     770          BAL   LINK,OUTCHR      LF                    MOS07700
07C6  2541          771          LCS   R4,1             DEL                   MOS07710
07C8  2302          772          BS    PRINT3B                                MOS07720
07CA  2441          773  PRINT3A LIS   R4,1             YES, OUTPUT X'01'     MOS07730
07CC  41F0 07E8     774  PRINT3B BAL   LINK,OUTCHR      TERMINAL CHARACTER    MOS07740
07D0  41F0 08BE     775  PRINT5  BAL   LINK,TSTBRK                            MOS07750
07D4  D100 17CC     776          LM    R0,RSAVE         RESTORE REGISTERS     MOS07760
07D8  030F          777          BR    LINK             RETURN                MOS07770
                    778  *-------------------------------                     MOS07780
                    779  *  SMALL SUPPORT ROUTINES                            MOS07790
                    780  *                                                    MOS07800
                    781  *  TO OUTPUT CR,LF TO LIST DEVICE                    MOS07810
                    782  *                                                    MOS07820
07DA  D000 17CC     783  CRLF    STM   R0,RSAVE         STORE REGISTERS       MOS07830
07DE  244D          784          LIS   R4,13                                  MOS07840
07E0  41F0 07E8     785          BAL   LINK,OUTCHR      OUTPUT CR             MOS07850
07E4  4300 07B8     786          B     PRINT3           LINE FEED, RESTORE, RETURN MOS07860
                    787  *-----------------------------                      MOS07870
                    788  *  TO OUTPUT A CHARACTER TO THE LIST DEVICE           MOS07880
07E8  40F0 0AB4     789  OUTCHR  STH   R15,OUT.SAV      SAVE RETURN ADDRESS   MOS07890
07EC  D300 010B     790          LB    R0,IOSAVE+1                            MOS07900
07F0  2704          791          SIS   R0,4                                   MOS07910
07F2  4230 0830     792          BNZ   OUTCHR2          BRANCH IF NOT CAROUSEL MOS07920
07F6  4000 0AB0     793  OTC.    STH   R0,PAUSE                               MOS07930
07FA  41F0 0942     794  OTC.0   BAL   LINK,TSTDU       ON LINE ?             MOS07940
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
07FE  4230 086C      795          BNZ   OUT0              NO, BRANCH                              MOS07950
0802  9D01           796          SSR   R0,R1             GET CAROUSEL STATUS                     MOS07960
0804  2386           797          BNCS  OTC.1             BRANCH IF CHAR. IS TO BE READ    ***    MOS07970
0806  4810 0AB0      798          LH    R1,PAUSE          PAUSED NOW ?                            MOS07980
080A  2038           799          BNZS  OTC.0             YES, LOOP                               MOS07990
080C  4300 0830      800          B     OUTCHR2           NO, GO OUTPUT CHARACTER                 MOS08000
0810  9B01           801  OTC.1   RDR   R0,R1             GET CAROUSEL CHARACTER                  MOS08010
0812  C410 007F      802          NHI   R1,X'7F'                                                   MOS08020
0816  CB10 0012      803          SHI   R1,X'12'          DC2 ?                                   MOS08030
081A  2134           804          BNZS  OTC.3             NO, BRANCH                              MOS08040
081C  4010 0AB0      805          STH   R1,PAUSE          YES, SET PAUSE FLAG                     MOS08050
0820  2308           806          BS    OUTCHR2           BRANCH                                  MOS08060
0822  2712           807  OTC.3   SIS   R1,2             DC4 ?                                   MOS08070
0824  4230 07FA      808          BNZ   OTC.0             NO, GO WAIT FOR DC2                     MOS08080
0828  40F0 0AB0      809          STH   LINK,PAUSE        RESET PAUSE FLAG                        MOS08090
082C  4300 07FA      810          B     OTC.0             GO WAIT FOR DC2                         MOS08100
                     811  *                                                                       MOS08110
0830  4010 0AB0      812  OUTCHR2 STH   R1,PAUSE          RESET FLAG                              MOS08120
0834  41F0 0942      813          BAL   LINK,TSTDU        OFF-LINE ?                              MOS08130
0838  4230 086C      814          BNZ   OUT0              BRANCH IF OFF-LINE                      MOS08140
083C  4110 09A2      815          BAL   R1,SETUP          SET UP FOR OUTPUT                       MOS08150
0840  9D01           816  OTC.4   SSR   R0,R1             WAIT FOR NOT BUSY                       MOS08160
0842  4230 086C      817          BTC   3,OUT0            BRANCH IF OFF-LINE                      MOS08170
0846  C510 000C      818          CLHI  R1,12             PASLA OFFLINE ?                         MOS08180
084A  4330 086C      819          BE    OUT0              BRANCH: YES.                            MOS08190
084E  C310 0008      820          THI   R1,8              BUSY ?                                  MOS08200
0852  2039           821          BNZS  OTC.4             WAIT FOR NOT BUSY.                      MOS08210
0854  9A04           822          WDR   R0,R4             OUTPUT DATA BYTE                        MOS08220
0856  41F0 0942      823  OTC.5   BAL   LINK,TSTDU        DEVICE DU ?                             MOS08230
085A  2139           824          BNZS  OUT0              YES, BRANCH                             MOS08240
085C  D310 010B      825          LB    R1,IOSAVE+1                                               MOS08250
0860  9111           826          SLHLS R1,1                                                      MOS08260
0862  D301 0111      827          LB    R0,IO+1(R1)       GET CONSOLE WRITE ADDRESS               MOS08270
0866  9D01           828          SSR   R0,R1                                                     MOS08280
0868  2089           829          BTBS  8,OTC.5           WAIT FOR NOT BUSY.                      MOS08290
086A  2303           830          BS    OUT1                                                      MOS08300
086C  4010 0AA2      831  OUT0    STH   R1,WASDU          SET WASDU FLAG                          MOS08310
0870  48F0 0AB4      832  OUT1    LH    LINK,OUT.SAV                                              MOS08320
0874  030F           833          BR    LINK              RETURN AS SET UP ABOVE                  MOS08330
                     834  *-----------------------------                                          MOS08340
                     835  *  TO GET A CHAR FROM KEYBOARD (IN REG R4)                              MOS08350
                     836  *                                                                       MOS08360
0876  4140 0986      837  GETCHR  BAL   R4,KBREAD         PUT KB DEVICE IN READ MODE              MOS08370
087A  0890           838          LDAR  R9,R0             SAVE CONSOLE ADDRESS                    MOS08380
087C  9D04           839          SSR   R0,R4                                                     MOS08390
087E  2081           840          BTBS  8,1               IF BUSY, LOOP (POSSIBLE HANG)    ***    MOS08400
0880  9B04           841          RDR   R0,R4             READ A CHAR IN R4                       MOS08410
                     842  * TO ECHO RECEIVED CHARACTERS TO CONSOLE DEVICE IN FDX MODE             MOS08420
0882  D400 011A      843  ECHO    CLB   R0,MICROBUS                                               MOS08430
0886  233B           844          BES   ECHO1             IF MICROBUS, BRANCH                     MOS08440
0888  D390 0A7C      845          LB    R9,CONRD                                                  MOS08450
088C  C590 00A9      846          CLHI  R9,X'A9'          CAROUSEL ?                              MOS08460
0890  2137           847          BNES  ECHRTN            YES, DO NOT ECHO                        MOS08470
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
0892  D390 0A7B        848          LB    R9,CONADR+1                                    MOS08480
0896  DD90 0A74        849          SS    R9,SINK                                        MOS08490
089A  2082              850          BTBS  8,2                                            MOS08500
089C  9A94              851  ECHO1   WDR   R9,R4          ECHO RECEIVED BYTE              MOS08510
089E  C440 007F         852  ECHRTN  NHI   R4,X'7F'       REMOVE PARITY BIT               MOS08520
08A2  030F              853          BR    LINK           RETURN                          MOS08530
                        854  *------------------------------                              MOS08540
                        855  *  TO OUTPUT '?' TO CONSOLE                                  MOS08550
                        856  *                                                            MOS08560
08A4  41F0 07DA         857  QUESTN  BAL   LINK,CRLF                                     MOS08570
08A8  40F0 0A9C         858          STH   LINK,ISITERR     SET FLAG                      MOS08580
08AC  C850 0B26         859          LHI   R5,QMSG                                        MOS08590
08B0  41F0 0752         860          BAL   LINK,PRINT       PRINT '?'                     MOS08600
08B4  2400              861          LIS   R0,0                                           MOS08610
08B6  4000 0A9C         862          STH   R0,ISITERR                                     MOS08620
08BA  4300 01CA         863          B     OPTIN1           TO ACCEPT COMMAND INPUT       MOS08630
                        864  *------------------------------                              MOS08640
                        865  * IF BREAK KEY DEPRESSED, GO TO 'OPTIN' OR (BRKVECT); ELSE RETURN.  MOS08650
                        866  *   BUT IF "BREAK" & CONTIN = 1, GO TO ABORT1.                MOS08660
                        867  *                                                            MOS08670
08BE  D000 17EC         868  TSTBRK  STM   R0,RSAVE+32     STORE REGISTERS               MOS08680
08C2  40F0 0AB6         869          STH   LINK,BRK.SAV     SAVE RETURN ADDRESS           MOS08690
08C6  D300 0A7A         870          LB    R0,CONADR        GET KEYBOARD DEVICE ADR       MOS08700
08CA  9D01              871          SSR   R0,R1                                          MOS08710
08CC  4210 0932         872          BTC   1,TSTBRK3        IF CLI OR MICROBUS DU, BRANCH MOS08720
08D0  C510 000C         873          CLHI  R1,X'0C'                                       MOS08730
08D4  4330 0932         874          BE    TSTBRK3          IF PASLA DU, BRANCH           MOS08740
08D8  C310 0020         875          THI   R1,X'20'         'BREAK' KEY PRESSED ?         MOS08750
08DC  4330 0932         876          BZ    TSTBRK3          NO, EXIT                      MOS08760
08E0  D320 0110         877          LB    R2,IO                                          MOS08770
08E4  C520 0005         878          CLHI  R2,5             IS IT MICROBUS ?              MOS08780
08E8  2139              879          BNES  TSTBRK4          NO, BRANCH                    MOS08790
08EA  9B02              880  TSTBRK5 RDR   R0,R2                                          MOS08800
08EC  9D01              881          SSR   R0,R1                                          MOS08810
08EE  C310 0020         882          THI   R1,X'20'                                       MOS08820
08F2  4230 08EA         883          BNZ   TSTBRK5                                        MOS08830
08F6  4300 091E         884          B     TSTBRK2                                        MOS08840
08FA  4820 0A76         885  TSTBRK4 LH    R2,PASFLG        PASLA ?                       MOS08850
08FE  233C              886          BZS   TSTBRK1          NO, BRANCH                    MOS08860
0900  C310 0008         887          THI   R1,8             ALREADY ACKNOWLEDGED ?        MOS08870
0904  4230 0932         888          BNZ   TSTBRK3          BRANCH IF YES                 MOS08880
0908  9B02              889          RDR   R0,R2                                          MOS08890
090A  9D01              890          SSR   R0,R1                                          MOS08900
090C  2281              891          BFBS  8,1                                            MOS08910
090E  0822              892          LDAR  R2,R2            ZERO CHARACTER ?              MOS08920
0910  4230 0932         893          BNZ   TSTBRK3          BRANCH: JUST FRAMING ERROR    MOS08930
0914  2305              894          BS    TSTBRK2                                        MOS08940
0916  9D01              895  TSTBRK1 SSR   R0,R1                                          MOS08950
0918  C310 0020         896          THI   R1,X'20'                                       MOS08960
091C  2033              897          BNZS  TSTBRK1          WAIT FOR BREAK KEY RELEASE    MOS08970
091E  48F0 0B48         898  TSTBRK2 LH    LINK,CONTIN+6    IF "CONTIN" = 1,          *** MOS08980
0922  4230 0526         899          BNZ   ABORT1           BRANCH & ABORT TESTING    *** MOS08990
0926  48F0 0A9A         900          LH    R15,BRKVECT      CHECK FOR SPECIAL ROUTINE     MOS09000
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
092A  4330 01BE        901           BZ    OPTIN              BRK W/NO VECTOR: TO EXEC.          MOS09010
092E  40F0 0AB6        902           STH   R15,BRK.SAV        SET UP FOR EXIT                    MOS09020
0932  2400             903 TSTBRK3   LIS   R0,0                                                  MOS09030
0934  4000 0A9A        904           STH   R0,BRKVECT         DELETE VECTOR AFTER ONE SHOT.      MOS09040
0938  D100 17EC        905           LM    R0,RSAVE+32        RESTORE REGISTERS                  MOS09050
093C  48F0 0AB6        906           LH    LINK,BRK.SAV       RESTORE RETURN ADDRESS             MOS09060
0940  030F             907           BR    LINK               RETURN TO PROGRAM                  MOS09070
                       908 *-----------------------------                                        MOS09080
                       909 * SEE IF CURRENT LIST DEVICE OFF-LINE (R1, CC NON-ZERO IF OFF)        MOS09090
                       910 *                                                                     MOS09100
0942  2401             911 TSTDU     LIS   R0,1                                                  MOS09110
0944  4810 0A78        912           LH    R1,PASFLG2                                            MOS09120
0948  2333             913           BZS   $TSTDU0                                               MOS09130
094A  C800 00FC        914           LHI   R0,X'FC'                                              MOS09140
094E  D310 010B        915 $TSTDU0   LB    R1,IOSAVE+1        GET LIST DEVICE IDENTIFIER         MOS09150
0952  9111             916           SLHLS R1,1               (R1) = 2,4,6,8,A...                MOS09160
0954  D311 0110        917           LB    R1,IO(R1)          GET LIST DEVICE ADDRESS            MOS09170
0958  D210 0A74        918           STB   R1,SINK            SAVE LIST DEVICE ADDRESS           MOS09180
095C  9D11             919           SSR   R1,R1              GRAB STATUS                        MOS09190
095E  0410             920           NAR   R1,R0                                                 MOS09200
0960  C310 0001        921           THI   R1,1               CLI DU ?                           MOS09210
0964  2135             922           BNZS  $TSTDU2            YES, BRANCH                        MOS09220
0966  C510 000C        923           CLHI  R1,X'0C'           PASLA DU ?                         MOS09230
096A  2332             924           BES   $TSTDU2            YES, BRANCH                        MOS09240
096C  2511             925 $TSTDU1   LCS   R1,1               FORCE R1 FOR RETURN CC = 0         MOS09250
096E  D300 0A74        926 $TSTDU2   LB    R0,SINK            RESTORE LIST DEVICE ADDRESS        MOS09260
0972  C710 FFFF        927           XHI   R1,-1              SET CONDITION CODE                 MOS09270
0976  030F             928           BR    LINK               RETURN                             MOS09280
                       929 * ---------------------------------                                   MOS09290
                       930 * TO DIRECT INPUT AND OUTPUT TO CONSOLE DEVICE                        MOS09300
                       931 *                                                                     MOS09310
0978  D300 0110        932 SETKB     LB    R0,IO              GET KEYBOARD DEVICE                MOS09320
097C  9410             933           EXBR  R1,R0                                                 MOS09330
097E  0610             934           OAR   R1,R0                                                 MOS09340
0980  4010 010A        935           STH   R1,IOSAVE          KB DEVICE = LIST DEVICE            MOS09350
0984  030F             936           BR    LINK               RETURN                             MOS09360
                       937 *-----------------------------                                        MOS09370
                       938 *  TO PUT KEYBOARD DEVICE IN READ MODE                                MOS09380
                       939 *                                                                     MOS09390
0986  D300 0A7A        940 KBREAD    LB    R0,CONADR                                             MOS09400
098A  DE00 0A7C        941           OC    R0,CONRD                                              MOS09410
098E  DB00 0A74        942           RD    R0,SINK                                               MOS09420
0992  4890 0A76        943           LH    R9,PASFLG          PASLA ?                            MOS09430
0996  4200 0996        944           NOP   *                  FOR SPECIAL KB DEVICE              MOS09440
099A  2333             945 TTYGET    BZS   KBXIT              NO, RETURN                         MOS09450
099C  DE00 0A94        946           OC    R0,CONRQ2S                                            MOS09460
09A0  0304             947 KBXIT     BR    R4                 RETURN                             MOS09470
                       948 *-----------------------------                              ***        MOS09480
                       949 *  LIST DEVICE SET UP ROUTINE                                         MOS09490
                       950 *                                                                     MOS09500
09A2  4010 0AB8        951 SETUP     STH   R1,SET.RTN                                            MOS09510
09A6  D310 010B        952           LB    R1,IOSAVE+1        GET LIST DEVICE IDENTIFIER         MOS09520
09AA  9111             953           SLHLS R1,1               HW INDEX                           MOS09530
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
09AC  D301 0111          954          LB    R0,IO+1(R1)        GET LIST DEVICE ADDRESS              MOS09540
09B0  DE01 0A7D          955          OC    R0,CONWRT(R1)                                           MOS09550
09B4  4810 0AB8          956          LH    R1,SET.RTN                                              MOS09560
09B8  0301               957          BR    R1                 RETURN                               MOS09570
                         958  ****************************                          ***   MOS09580
                         959  *  LOW CORE SET UP ROUTINE                                            MOS09590
                         960  *                                                                      MOS09600
09BA  2410               961  LCORE   LIS   R1,0                                                    MOS09610
09BC  2422               962          LIS   R2,2                                                    MOS09620
09BE  C830 004E          963          LHI   R3,X'4E'                                                MOS09630
09C2  2400               964          LIS   R0,0                                                    MOS09640
09C4  4001 0000          965  ZERO1   STH   R0,0(R1)                                                MOS09650
09C8  C110 09C4          966          BXLE  R1,ZERO1             ZERO CORE FROM 0 THRU X'4F'          MOS09660
09CC  C830 0A04          967          LHI   R3,II                                                   MOS09670
09D0  4030 0036          968          STH   R3,X'36'             ILL INST INT NEW PSW LOC             MOS09680
09D4  C840 0A38          969          LHI   R4,MM                                                   MOS09690
09D8  4040 003E          970          STH   R4,X'3E'             M. M. INT NEW PSW LOC                MOS09700
09DC  C840 17CC          971          LHI   R4,RSAVE                                                MOS09710
                         972  *                                                                      MOS09720
                         973  *  SET UP LOW CORE FOR 16 BIT MACHINE                                 MOS09730
                         974  *                                                                      MOS09740
09E0  4040 0022          975          STH   R4,X'22'             REG SAVE POINTER                     MOS09750
09E4  030F               976          BR    LINK                 RETURN                               MOS09760
                         977  *--------------------------------                          ***   MOS09770
                         978  *  SPURIOUS INTERRUPT HANDLERS                                        MOS09780
                         979  *                                                                      MOS09790
09E6  40E0 0A70          980  COMM    STH   R14,OPSW                                                MOS09800
09EA  40F0 0A72          981          STH   R15,OLOC                                                MOS09810
09EE  4800 0108          982  COMM1   LH    R0,PSW2                                                 MOS09820
09F2  9520               983          EPSR  R2,R0                NO INT. , REG SET 15                 MOS09830
09F4  41F0 05FE          984          BAL   LINK,ERR             PRINT 'ERROR XXFN'                   MOS09840
09F8  40F0 0A9C          985          STH   LINK,ISITERR         FORCE PRINT                          MOS09850
09FC  41E0 065A          986          BAL   RET,ERRPL1           PRINT 'PSW PPPP  LOC LLLL'           MOS09860
0A00  4300 01CA          987          B     OPTIN1               ENTER COMMAND MODE                   MOS09870
                         988  *                                                                      MOS09880
                         989  *  ILLEGAL INSTRUCTION INTERRUPT TRAP                                 MOS09890
                         990  *                                                                      MOS09900
0A04  C820 0A38          991  II      LHI   R2,MM                *                          ***   MOS09910
0A08  4020 003E          992          STH   R2,X'3E'             RESTORE ETPE MM POINTER      ***   MOS09920
0A0C  C820 4632          993          LHI   R2,C'F2'                                                MOS09930
0A10  4020 0AE6          994          STH   R2,ERRNO             SET ERROR NUMBER = F2                MOS09940
0A14  48E0 0030          995          LH    R14,X'30'            OLD PSW                              MOS09950
0A18  48F0 0032          996          LH    R15,X'32'            OLD LOC                              MOS09960
0A1C  4300 09E6          997  II32    B     COMM                 *                          ***   MOS09970
                         998  *                                                                      MOS09980
                         999  *  MACHINE MALFUNCTION INTERRUPT TRAP                                 MOS09990
                        1000  *                                                                      MOS10000
0A20  95AA              1001  MM0     EPSR  R10,R10              CAPTURE MMINT PSW            ***   MOS10010
0A22  C820 0A38         1002          LHI   R2,MM                *                          ***   MOS10020
0A26  4020 003E         1003          STH   R2,X'3E'             RESTORE ETPE MM POINTER      ***   MOS10030
0A2A  C4A0 000F         1004          NHI   R10,X'000F'          *                            ***   MOS10040
0A2E  08AA              1005          LDAR  R10,R10              IS CC = 0 ?                  ***   MOS10050
0A30  2137              1006          BNZS  MM1                  NO, BRANCH                   ***   MOS10060
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
0A32  41F0 1568          1007          BAL   LINK,PARERR        PRINT ERROR (PARITY)          ***  MOS10070
0A36  2304               1008          BS    MM1                *                             ***  MOS10080
                         1009  *                                                                   MOS10090
0A38  95AA               1010  MM      EPSR  R10,R10           CAPTURE MMINT PSW                  MOS10100
0A3A  C4A0 000F          1011          NHI   R10,X'000F'        *                             ***  MOS10110
0A3E  C820 4633          1012  MM1     LHI   R2,C'F3'                                           MOS10120
0A42  4020 0AE6          1013          STH   R2,ERRNO           SET ERROR NUMBER F3               MOS10130
0A46  48E0 0038          1014          LH    R14,X'38'          OLD PSW (16 BIT PROCESSOR)        MOS10140
0A4A  48F0 003A          1015          LH    R15,X'3A'          OLD LOC                           MOS10150
0A4E  C4E0 FFF0          1016  MM32    NHI   R14,X'FFF0'                                         MOS10160
0A52  06EA               1017          OAR   R14,R10            R14 = COMPOSITE PSW               MOS10170
0A54  40E0 0A70          1018          STH   R14,OPSW                                            MOS10180
0A58  40F0 0A72          1019          STH   R15,OLOC                                            MOS10190
0A5C  C810 7FFF          1020          LHI   R1,X'7FFF'                                          MOS10200
0A60  2711               1021  MM16    SIS   R1,1               TIMEOUT                           MOS10210
0A62  2021               1022          BPS   MM16                                                MOS10220
0A64  C800 80F0          1023          LHI   R0,X'80F0'         R0 = X'80F0'                  ***  MOS10230
0A68  9520               1024          EPSR  R2,R0              HALT PROCESSOR                    MOS10240
                         1025  *                                                                   MOS10250
                         1026  *   WHEN EXE/RUN IS DEPRESSED, ERROR MSG IS PRINTED.               MOS10260
                         1027  *                                                                   MOS10270
0A6A  4300 09EE          1028          B     COMM1                                               MOS10280
                         1029  ************************************                                MOS10290
                         1030  *  ETPE CONSTANTS & TABLES                                         MOS10300
                         1031  *                                                                   MOS10310
0A70                     1032          ALIGN 8                                                     MOS10320
                         1033  *----------------------------------                               MOS10330
0A70  0000               1034  OPSW    DCX   0                                                   MOS10340
0A72  0000               1035  OLOC    DCX   0                                                   MOS10350
                         1036  *----------------------------------                               MOS10360
0A74  00                 1037  SINK    DB    0                  BIT BUCKET                     MOS10370
0A75  00                 1038          DB    *                                                   MOS10380
0A76  0000               1039  PASFLG  DCX   0                  SET WHEN CONSOLE ON PASLA/PALM    MOS10390
0A78  0000               1040  PASFLG2 DCX   0                  SET WHEN LIST DEVICE ON PASLA     MOS10400
                         1041  *----------------------------------                               MOS10410
                         1042  *  ETPE IO COMMANDS                                               MOS10420
                         1043  *                                                                   MOS10430
0A7A  0000               1044  CONADR  DCX   0                  CONSOLE DEVICE ADDRESS            MOS10440
                         1045  *                                                                   MOS10450
0A7C  0000               1046  CONRD   DCX   0                  CONSOLE READ/WRITE COMMANDS       MOS10460
      0000 0A7D          1047  CONWRT  EQU   CONRD+1                                             MOS10470
0A7E  B1A3               1048  CRTRD   DCX   B1A3               FOR CRT                           MOS10480
0A80  A4D8               1049  CLIFRD  DCX   A4D8               *   CURRENT LOOP INTERFACE        MOS10490
0A82  0080               1050  LPWRT   DCX   0080               *   LINE PRINTER                  MOS10500
0A84  A1A3               1051  CARRD   DCX   A1A3               *   CAROUSEL 300                  MOS10510
0A86  8202               1052  MREADC  DCX   8202               *   MICROBUS                      MOS10520
                         1053  *                                                                   MOS10530
0A88  0000               1054  CON2ND  DCX   0                  2ND COMMAND; ENABLE READ COMMAND  MOS10540
      0000 0A89          1055  CONENRD EQU   CON2ND+1                                            MOS10550
0A8A  F871               1056  CRT2ND  DCX   F871               FOR CRT                           MOS10560
0A8C  0064               1057  CLIF2ND DCX   0064               *   CURRENT LOOP INTERFACE        MOS10570
0A8E  0000               1058          DCX   0                  *   DUMMY HW FOR LP               MOS10580
0A90  F061               1059  CAR2ND  DCX   F061               *   CAROUSEL 300                  MOS10590
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
0A92  0000                1060          DCX   0                  *   DUMMY HW FOR MICROBUS            MOS10600
                          1061  *                                                                       MOS10610
0A94  00                  1062  CONRQ2S DB    0                  CONSOLE REQUEST TO SEND CMD          MOS10620
0A95  33                  1063  CRTRQ2S DB    X'33'              FOR CRT                              MOS10630
0A96  00                  1064          DB    0                  *   DUMMY BYTE FOR CLI               MOS10640
0A97  00                  1065          DB    0                  *   DUMMY BYTE FOR LP                MOS10650
0A98  23                  1066  CARRQ2S DB    X'23'              *   CAROUSEL 300                     MOS10660
0A99  00                  1067          DB    0                  *   DUMMY BYTE FOR MICROBUS          MOS10670
0A9A                      1068          DB    *                                                       MOS10680
                          1069  *-----------------------------------                                  MOS10690
0A9A  0000                1070  BRKVECT DC    Z(0)               BREAK KEY VECTOR                     MOS10700
0A9C  0000                1071  ISITERR DCX   0                                                       MOS10710
0A9E  0000                1072  NOERR   DCX   0                                                       MOS10720
0AA0  0000                1073  SELTST  DCX   0                  HIGHEST SELECTED TEST NUMBER         MOS10730
0AA2  0000                1074  WASDU   DCX   0                  1 IF KEYBOARD DEVICE WAS OFF         MOS10740
0AA4  0000                1075  WASDU1  DCX   0                  NON-ZERO IF TOTAL,TOTERR TO PRINT    MOS10750
0AA6  0000                1076  TOTAL   DCX   0                  NO. OF TIMES THE SELECTED TESTS RUN  MOS10760
0AA8  0000                1077  TOTERR  DCX   0                  TOTAL ERRORS DETECTED WHILE DU       MOS10770
0AAA  0000                1078  BTESTNO DCX   0                  CURRENT TEST NUMBER IN BINARY        MOS10780
0AAC  0000                1079  COUNT   DCX   0                                                       MOS10790
0AAE  0000                1080  NEXTST  DCX   0                  NEXT TEST NUMBER                     MOS10800
0AB0  0000                1081  PAUSE   DCX   0                                                       MOS10810
                          1082  *-----------------------------------                          ***     MOS10820
0AB2  0000                1083  COMRET  DCX   0                  COMMON ERROR RETURN ADDRESS          MOS10830
0AB4  0000                1084  OUT.SAV DCX   0                  OUTCHR RETURN ADDRESS                MOS10840
0AB6  0000                1085  BRK.SAV DCX   0                  ISTBRK RETURN ADDRESS                MOS10850
0AB8  0000                1086  SET.RTN DCX   0                  SETUP RETURN ADDRESS                 MOS10860
                          1087  *                                                                       MOS10870
0ABA  0001                1088  DECTAB  DC    1,10,100,1000,10000                                     MOS10880
0ABC  000A
0ABE  0064
0AC0  03E8
0AC2  2710
0AC4  3031 3233 3435 3637 1089  HEXTAB  DB    C'0123456789ABCDEF'                                     MOS10890
0ACC  3839 4142 4344 4546
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
                          1091  *--------------------------------                                                MOS10910
                          1092  *  ETPE MESSAGES                                                                 MOS10920
                          1093  *                                                                                MOS10930
0AD4  5445 5354 2020 2A2A 1094  TSTMSG   DC    C'TEST  **',X'0D00'                                               MOS10940
0ADC  0D00
      0000 0ADA           1095  MTESTNO  EQU   TSTMSG+6                                                         MOS10950
0ADE  4552 524F 5220 2A2A 1096  ERRMSG   DC    C'ERROR ****',X'0D00'                                            MOS10960
0AE6  2A2A
0AE8  0D00
      0000 0AE4           1097  ETESTNO  EQU   ERRMSG+6            STORED BY ETPE                             MOS10970
      0000 0AE6           1098  ERRNO    EQU   ERRMSG+8            STORE ERRNO AS CHARACTER CONSTANT          MOS10980
0AEA  544F 5441 4C20 2020 1099  TOTMSG   DC    C'TOTAL   TOTERR',X'0D00'                                        MOS10990
0AF2  544F 5445 5252
0AF8  0D00
0AFA  4E4F 2045 5252 4F52 1100  NOERMSG  DC    C'NO ERROR',X'0D00'                                              MOS11000
0B02  0D00
0B04  5053 5720 2A2A 2A2A 1101  PSWMSG   DC    C'PSW ****  LOC ****',X'0D00'                                    MOS11010
0B0C  2020 4C4F 4320 2A2A
0B14  2A2A
0B16  0D00
      0000 0B08           1102  ASCIPSW  EQU   PSWMSG+4                                                         MOS11020
      0000 0B0E           1103  LOCMSG   EQU   PSWMSG+10                                                        MOS11030
      0000 0B12           1104  ASCILOC  EQU   PSWMSG+14                                                        MOS11040
0B18  454E 4420 4F46 2054 1105  EOTMSG   DC    C'END OF TEST',X'0D00'                                           MOS11050
0B20  4553 5420
0B24  0D00
0B26  3F0D                1106  QMSG     DC    X'3F0D'                                                          MOS11060
0B28  2A0D                1107  AMSG     DC    X'2A0D'                                                          MOS11070
```

```
                         1110  ************************************************************************  MOS11100
                         1111  *                                                                       MOS11110
                         1112  *  OPTION/COMMAND TABLE                                                 MOS11120
                         1113  *                                                                       MOS11130
0B2A  5445 5354 2020     1114  TEST     DC    C'TEST  ',X'FE00',X'0',X'0' *          0 TO 8          MOS11140
0B30  FE00
0B32  0000
0B34  0000
      0000 0B2A          1115  OPT      EQU   TEST                                                     MOS11150
                         1116  *                                                                       MOS11160
0B36  4C4F 4F50 2020     1117  LOOP     DC    C'LOOP  ',X'0',Z(LEVELIN),X'7FFF' *    MAX=X'7FFF'     MOS11170
0B3C  0000
0B3E  03AA
0B40  7FFF
0B42  434F 4E54 494E     1118  CONTIN   DC    C'CONTIN',X'0',Z(LEVELIN),X'1' *       0 OR 1          MOS11180
0B48  0000
0B4A  03AA
0B4C  0001
0B4E  4E4F 4D53 4720     1119  NOMSG    DC    C'NOMSG ',X'0',Z(LEVELIN),X'1' *       0 OR 1          MOS11190
0B54  0000
0B56  03AA
0B58  0001
0B5A  5343 4F50 4520     1120  SCOPE    DC    C'SCOPE ',X'0',Z(LEVELIN),X'5' *       MAX = 5         MOS11200
0B60  0000
0B62  03AA
0B64  0005
0B66  4441 5441 2020     1121  DATA     DC    C'DATA  ',X'FFFF',X'0',X'0' *          0 TO FFFF       MOS11210
0B6C  FFFF
0B6E  0000
0B70  0000
0B72  504F 554E 4420     1122  POUND    DC    C'POUND ',X'A',X'0',X'0' *             1 TO FFFF       MOS11220
0B78  000A
0B7A  0000
0B7C  0000
                         1123  *                                                                       MOS11230
                         1124  ************************************************************************  MOS11240
                         1125  *                                                                       MOS11250
0B7E  4C4F 4C49 4D20     1126  LOLIM    DC    C'LOLIM ',X'0',X'0',X'0' *             2000 TO FFFC    MOS11260
0B84  0000
0B86  0000
0B88  0000
0B8A  4849 4C49 4D20     1127  HILIM    DC    C'HILIM ',X'0',X'0',X'0' *             2002 TO FFFE    MOS11270
0B90  0000
0B92  0000
0B94  0000
                         1128  *                                                                       MOS11280
                         1129  ************************************************************************  MOS11290
                         1130  *                                                                       MOS11300
      0000 0B96          1131  OPTEND2  EQU   *                                                       MOS11310
      0000 0B96          1132  OPTEND   EQU   OPTEND2                                                 MOS11320
                         1133  *                                                                       MOS11330
0B96  4F50 5449 4F4E     1134  OPTION   DC    C'OPTION',X'0',X'0',X'0'                                MOS11340
0B9C  0000
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
0B9E  0000
0BA0  0000
0BA2  5255 4E20 2020        1135  RUN      DC    C'RUN   ',X'0',X'0',X'0'                                  MOS11350
0BA8  0000
0BAA  0000
0BAC  0000
0BAE  FFFF                  1136           DC    -1                                                        MOS11360
                            1137  ********************************************************************** MOS11370
                            1138  *                                                                      MOS11380
0BB0  48E0 0B90             1139  INIT     LH    R14,HILIM+6         IS HILIM = 0 ?                     MOS11390
0BB4  233D                  1140           BZS   INIT1               YES, SKIP LIMIT CHECK              MOS11400
0BB6  48E0 0B84             1141           LH    R14,LOLIM+6         IS LOLIM = 0 ?                     MOS11410
0BBA  233A                  1142           BZS   INIT1               YES, SKIP LIMIT CHECK              MOS11420
0BBC  C5E0 2000             1143           CLAI  R14,X'2000'         IS LOLIM > OR = X'2000' ?          MOS11430
0BC0  4280 0BE2             1144           BL    HILOPRT             NO, BRANCH TO ERROR PRINTOUT       MOS11440
0BC4  45E0 0B90             1145           CLH   R14,HILIM+6         IS LOLIM < OR = HILIM ?            MOS11450
0BC8  2333                  1146           BES   INIT1               YES, BRANCH                        MOS11460
0BCA  4380 0BE2             1147           BNL   HILOPRT             NO, BRANCH TO ERROR PRINTOUT       MOS11470
                            1148  *                                                                      MOS11480
                            1149  *                                                                      MOS11490
0BCE  48E0 0B30             1150  INIT1    LH    R14,TEST+6                                               MOS11500
0BD2  C6E0 8000             1151           OHI   R14,X'8000'         FORCE TEST 0                       MOS11510
0BD6  40E0 0B30             1152           STH   R14,TEST+6          WHEN "RUN" IS ENTERED              MOS11520
0BDA  24E1                  1153           LIS   R14,1                                                  MOS11530
0BDC  DEE0 010E             1154           OC    R14,NORM            PUT DISPLAY IN NORMAL MODE         MOS11540
0BE0  030F                  1155           BR    LINK                RETURN TO CALLER                   MOS11550
                            1156  *                                                                      MOS11560
                            1157  *                                                             ***      MOS11570
0BE2  C850 1696             1158  HILOPRT  LHI   R5,HILOMSG          UNCONDITIONALLY PRINT:             ***  MOS11580
0BE6  4050 0A9C             1159           STH   R5,ISITERR          *                                  ***  MOS11590
0BEA  41F0 0752             1160           BAL   LINK,PRINT          "LOLIM > HILIM IS ILLEGAL"         ***  MOS11600
0BEE  4300 01BE             1161           B     OPTIN               ABORT TESTING SEQUENCE             ***  MOS11610
                            1162  *                                                             ***      MOS11620
                            1163  ********************************************************************** MOS11630
                            1164  *                                                                      MOS11640
0BF2  5331 3620 3139 2D31   1165  TITLE    DC    C'S16 19-197 MOS MEMORY TEST PART 2 '                    MOS11650
0BFA  3937 204D 4F53 204D
0C02  454D 4F52 5920 5445
0C0A  5354 2050 4152 5420
0C12  3220
0C14  3036 2D32 3034 4630   1166           DC    C'06-204F01R01'     *                                  ***  MOS11660
0C1C  3152 3031
0C20  0D0A                  1167           DC    X'0D0A'                                                  MOS11670
                            1168  *                                                                      MOS11680
                            1169  *                                                                      MOS11690
0C22  FE00                  1170  DEFTESTS DCX   FE00                DEFINES TESTS 0,1,2,3,4,5,& 6      MOS11700
                            1171  *                                 AS DEFAULT TESTS                   MOS11710
                            1172  *                                                                      MOS11720
0C24  0008                  1173  MAXTST   DC    H'8'                DEFINES TESTS 0,1,2,3,4,5,6,7,& 8  MOS11730
                            1174  *                                 AS LEGAL TEST NUMBERS.             MOS11740
```

EXEC - ETPE R03-06 (16 BIT/STRIPED AND MODIFIED)

```
                        1176  *                                                                    MOS11760
                        1177  *  TESTS TABLE                                                       MOS11770
                        1178  *                                                                    MOS11780
0C28                    1179          ALIGN 4                                                      MOS11790
0C28   0C3A             1180  TESTS   DC    A(TEST0)            *                          ***    MOS11800
0C2A   0D04             1181          DC    A(TEST1)                                              MOS11810
0C2C   0D7E             1182          DC    A(TEST2)                                              MOS11820
0C2E   0E82             1183          DC    A(TEST3)                                              MOS11830
0C30   0F2E             1184          DC    A(TEST4)                                              MOS11840
0C32   107E             1185          DC    A(TEST5)                                              MOS11850
0C34   1186             1186          DC    A(TEST6)                                              MOS11860
0C36   133C             1187          DC    A(TEST7)                                              MOS11870
0C38   142E             1188          DC    A(TEST8)                                              MOS11880
                        1189  *                                                                    MOS11890
                        1190  ************************************************************************MOS11900
                        1191  *       END   ETPE R03-05 (MODIFIED)                           ***    MOS11910
```

TEST 0

```
                        1193  *       TEST 0                    MEMORY SEARCH TEST                    MOS11930
                        1194  *                                                                       MOS11940
                        1195  *       PURPOSE:                                                        MOS11950
                        1196  *             THIS UTILITY ENABLES THE USER TO LIST EXISTANT,            MOS11960
                        1197  *             RESPONSIVE LIMITS OF MEMORY.                              MOS11970
                        1198  *                                                                       MOS11980
                        1199  *       ASSUMPTIONS:                                                    MOS11990
                        1200  *             MINIMUM MEMORY ALLOWABLE IS 16K BYTES.                    MOS12000
                        1201  *                                                                       MOS12010
                        1202  *       DESIGN SPECIFICATIONS:                                          MOS12020
                        1203  *             1. MEMORY SEARCH IS DONE IN 4KB BLOCKS.                   MOS12030
                        1204  *             2. A WRITE AND A READ IS DONE ON EACH BLOCK. IF THE DATA   MOS12040
                        1205  *                COMPARES, A DUMMY WRITE AND A TRUE READ IS EXECUTED     MOS12050
                        1206  *                TO INSURE THE VALIDITY OF THE DATA READ.               MOS12060
                        1207  *             3. WHEN WRAP-AROUND (64KB) IS DETECTED, THE MEMORY        MOS12070
                        1208  *                BIT MAP IS PRINTED OUT ON THE LIST DEVICE IN THE        MOS12080
                        1209  *                FORM OF CONTIGOUS MEMORY LOCATIONS.                    MOS12090
                        1210  *                                                                       MOS12100
                        1211  *       OPTIONS:                                                        MOS12110
                        1212  *             NONE                                                      MOS12120
                        1213  *                                                                       MOS12130
                        1214  *       HOW TO RUN THE TEST:                                            MOS12140
                        1215  *             ENTER "RUN" AND THE AVAILABLE MEMORY LOCATIONS WILL        MOS12150
                        1216  *             BE PRINTED ON THE LIST DEVICE IN CONTIGUIOUS BLOCKS.       MOS12160
                        1217  *                                                                       MOS12170
                        1218  *       NOTE:                                                           MOS12180
                        1219  *               THIS TEST RESETS "LOLIM" AND "HILIM" TO CORRESPOND TO   MOS12190
                        1220  *             THE BLOCK OF MEMORY PRINTED OUT WHEN "LOLIM" OR "HILIM"   MOS12200
                        1221  *             = 0.                                                      MOS12210
                        1222  *                                                                       MOS12220
                        1223  *               IF "LOLIM"  AND "HILIM" ARE NOT = 0, THE ASSIGNED       MOS12230
                        1224  *             "LOLIM" & "HILIM" ARE NOT CHANGED BUT, ARE PRINTED OUT    MOS12240
                        1225  *             ON THE LIST DEVICE.                                       MOS12250

0C3A  4860 0B84         1227  TEST0   LH    R6,LOLIM+6          GET LOW ADDRESS LIMIT VALUE         MOS12270
0C3E  4230 0CA8         1228          BNZ   LIM                 BRANCH IF NOT ZERO                  MOS12280
                        1229  *                                                                       MOS12290
0C42  24F0              1230  TOCS    LIS   LINK,0                                                   MOS12300
0C44  95EF              1231          EPSR  R14,LINK            CLEAR PSW                           MOS12310
0C46  C860 2000         1232          LHI   R6,X'2000'                                              MOS12320
0C4A  4060 0B84         1233          STH   R6,LOLIM+6          ESTABLISH LOLIM = X'2000'           MOS12330
0C4E  2404              1234          LIS   R0,4                                                    MOS12340
0C50  0816              1235          LDAR  R1,R6                                                   MOS12350
0C52  C820 172A         1236          LHI   R2,LOMSG                                                MOS12360
0C56  41F0 06F2         1237          BAL   LINK,HEXASC         PUT LOLIM IN AVAIL. MEM. MESSAGE    MOS12370
0C5A  C860 3000         1238          LHI   R6,X'3000'                                              MOS12380
0C5E  C870 1000         1239          LHI   R7,X'1000'                                              MOS12390
0C62  C8A0 A5A5         1240          LHI   R10,X'A5A5'                                             MOS12400
0C66  C8B0 5A5A         1241          LHI   R11,X'5A5A'                                             MOS12410
                        1242  *                                                                       MOS12420
0C6A  40A6 0000         1243  QTOP    STH   R10,0(R6)           STORE DATA PATTERNS                 MOS12430
```

TEST 0

```
0C6E  40B6 0002          1244          STH   R11,2(R6)          AT 4KB BOUNDRY                          MOS12440
0C72  4846 0000          1245          LH    R4,0(R6)           LOAD DATA FROM 4KB BOUNDRY              MOS12450
0C76  054A               1246          CLAR  R4,R10             DATA OK ?                               MOS12460
0C78  2137               1247          BNES  TOCFND             NO, TOP OF MEMORY FOUND                 MOS12470
0C7A  4846 0002          1248          LH    R4,2(R6)           LOAD DATA FROM 4KB BOUNDRY +2           MOS12480
0C7E  054B               1249          CLAR  R4,R11             DATA OK ?                               MOS12490
0C80  2133               1250          BNES  TOCFND             NO, TOP OF MEMORY FOUND                 MOS12500
0C82  0A67               1251          AHR   R6,R7              YES, INCREMENT TOC. COUNTER             MOS12510
0C84  203D               1252          BNZS  QTOP               BRANCH IF NOT ZERO TO CONTINUE          MOS12520
                         1253  *                                                                         MOS12530
0C86  2761               1254  TOCFND  SIS   R6,1               R6 = TOC                                MOS12540
0C88  2404               1255          LIS   R0,4                                                       MOS12550
0C8A  0816               1256          LDAR  R1,R6                                                      MOS12560
0C8C  C820 172F          1257          LHI   R2,HIMSG                                                   MOS12570
0C90  41F0 06F2          1258          BAL   LINK,HEXASC        PUT HILIM IN AVAIL. MEM. MESSAGE        MOS12580
0C94  C560 FFFF          1259          CLAI  R6,-1              TOC = X'FFFF' ?                         MOS12590
0C98  2132               1260          BNES  TOC1               NO, BRANCH                              MOS12600
0C9A  2762               1261          SIS   R6,2               YES, ALIGN FOR BXLE USE                 MOS12610
0C9C  4060 0B90          1262  TOC1    STH   R6,HILIM+6         STORE HILIM IN MEMORY                   MOS12620
0CA0  C850 16B0          1263          LHI   R5,AVMEMMSG                                                MOS12630
0CA4  4300 0CF4          1264          B     PRTLIM                                                     MOS12640
                         1265  *                                                                         MOS12650
0CA8  C560 2000          1266  LIM     CLAI  R6,X'2000'         IS LOLIM < X'2000' ?                    MOS12660
0CAC  4280 0C42          1267          BL    TOCS               YES, ESTABLISH NEW LIMITS               MOS12670
0CB0  4880 0B90          1268          LH    R8,HILIM+6         GET HILIM                               MOS12680
0CB4  4330 0C42          1269          BZ    TOCS               IF ZERO, ESTABLISH NEW LIMITS           MOS12690
0CB8  0568               1270          CLAR  R6,R8              IS LOLIM < OR = HILIM ?                 MOS12700
0CBA  4380 0BE2          1271          BNL   HILOPRT            NO, PRINT ERROR MESSAGE                 MOS12710
0CBE  2404               1272          LIS   R0,4                                                       MOS12720
0CC0  0816               1273          LDAR  R1,R6                                                      MOS12730
0CC2  C820 172A          1274          LHI   R2,LOMSG                                                   MOS12740
0CC6  41F0 06F2          1275          BAL   LINK,HEXASC        PUT LOLIM IN ASSIGN. MEM. MESSAGE       MOS12750
0CCA  C580 FFFD          1276          CLAI  R8,-3              IS HILIM = X'FFFD' ?                    MOS12760
0CCE  2132               1277          BNES  LIM1               NO, BRANCH                              MOS12770
0CD0  2682               1278          AIS   R8,2               YES, ESTABLISH HILIM = X'FFFF'          MOS12780
0CD2  0818               1279  LIM1    LDAR  R1,R8                                                      MOS12790
0CD4  C820 172F          1280          LHI   R2,HIMSG                                                   MOS12800
0CD8  41F0 06F2          1281          BAL   LINK,HEXASC        PUT HILIM IN ASSIGN. MEM. MESSAGE       MOS12810
0CDC  C580 FFFF          1282          CLAI  R8,-1              IS HILIM = X'FFFF' ?                    MOS12820
0CE0  2132               1283          BNES  LIM2               NO, BRANCH                              MOS12830
0CE2  2781               1284          SIS   R8,1               YES, SUBTRACT 1                         MOS12840
0CE4  C580 FFFE          1285  LIM2    CLAI  R8,-2              IS HILIM = X'FFFE' ?                    MOS12850
0CE8  2132               1286          BNES  LIM3               NO, BRANCH                              MOS12860
0CEA  2781               1287          SIS   R8,1               YES, SUBTRACT 1                         MOS12870
0CEC  4080 0B90          1288  LIM3    STH   R8,HILIM+6         MODIFY HILIM FOR BXLE'S                 MOS12880
0CF0  C850 1684          1289          LHI   R5,ASMEMMSG                                                MOS12890
                         1290  *                                                                         MOS12900
0CF4  41F0 0752          1291  PRTLIM  BAL   LINK,PRINT         PRINT AS/AV MEMORY MESSAGE              MOS12910
0CF8  C850 172A          1292          LHI   R5,LOMSG                                                   MOS12920
0CFC  41F0 0752          1293          BAL   LINK,PRINT         PRINT MEMORY LIMITS                     MOS12930
0D00  4300 04CA          1294          B     KEEP7                                                      MOS12940
                         1295  ********************************************************************    MOS12950
                         1296  *       END   TEST 0                                                     MOS12960
```

TEST 1

```
                                1298  *       TEST 1                BIT SET - RESET TEST                      MOS12980
                                1299  *                                                                       MOS12990
                                1300  *       PURPOSE:                                                        MOS13000
                                1301  *             THIS TEST INSURES THAT ALL BITS IN THE AREA OF MEMORY      MOS13010
                                1302  *             BEING TESTED CAN BE BOTH SET AND RESET.                   MOS13020
                                1303  *                                                                       MOS13030
                                1304  *       ASSUMPTIONS:                                                    MOS13040
                                1305  *             NONE                                                      MOS13050
                                1306  *                                                                       MOS13060
                                1307  *       DESIGN SPECIFICATIONS:                                          MOS13070
                                1308  *             1. A WRITE AND THEN A READ IS EXECUTED TO ALL MEMORY      MOS13080
                                1309  *                WITHIN THE "LOLIM" AND "HILIM" LIMITS.                 MOS13090
                                1310  *             2. IF AN ERROR IS DETECTED, THE "SCOPE" OPTION            MOS13100
                                1311  *                DICTATES HOW THE PROGRAM WILL REACT.                   MOS13110
                                1312  *                                                                       MOS13120
                                1313  *       OPTIONS:                                                        MOS13130
                                1314  *             HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST              MOS13140
                                1315  *             LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST               MOS13150
                                1316  *             SCOPE - ERROR OPTION MODE                                 MOS13160
                                1317  *                 0 - PRINT ERROR DATA AND SKIP TO NEXT TEST            MOS13170
                                1318  *                 1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST    MOS13180
                                1319  *                 2 - PRINT ERROR DATA AND CONTINUE TEST                MOS13190
                                1320  *                 3 - PRINT ERROR DATA AND HALT                         MOS13200
                                1321  *                 4 - IGNORE ERROR                                      MOS13210
                                1322  *                 5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST        MOS13220
                                1323  *                                                                       MOS13230
                                1324  *       HOW TO RUN THE TEST:                                            MOS13240
                                1325  *             1. ENTER THE "LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA    MOS13250
                                1326  *                THE CONSOLE DEVICE.                                    MOS13260
                                1327  *             2. ENTER "RUN" AND THE TEST WILL EXECUTE.                 MOS13270

0D04  4860 0B84                 1329  TEST1   LH    R6,LOLIM+6        INITIALIZE MEMORY LIMITS                MOS13290
0D08  4880 0B90                 1330          LH    R8,HILIM+6                                                MOS13300
0D0C  2472                      1331          LIS   R7,2                                                      MOS13310
0D0E  2411                      1332          LIS   R1,1              LOAD DISPLAY ADDRESS                    MOS13320
0D10  2531                      1333          LCS   R3,1                                                      MOS13330
                                1334  *                                                                       MOS13340
0D12  4036 0000                 1335  STORE11 STH   R3,0(R6)          STORE BACKGROUND OF ALL 1'S             MOS13350
0D16  C160 0D12                 1336          BXLE  R6,STORE11                                                MOS13360
0D1A  C840 3031                 1337          LHI   R4,C'01'                                                  MOS13370
0D1E  4040 0AE6                 1338          STH   R4,ERRNO          ERRNO = C'01'                           MOS13380
0D22  4860 0B84                 1339          LH    R6,LOLIM+6                                                MOS13390
                                1340  *                                                                       MOS13400
0D26  94A6                      1341  READ11  EXBR  R10,R6                                                    MOS13410
0D28  981A                      1342          WHR   R1,R10            DISPLAY ADDRESS UNDER TEST              MOS13420
0D2A  C8F0 04A4                 1343          LHI   LINK,TSTEND                                               MOS13430
0D2E  40F0 0A9A                 1344          STH   LINK,BRKVECT                                              MOS13440
0D32  41F0 08BE                 1345          BAL   LINK,TSTBRK       IF "BREAK" GO TO TSTEND ELSE RETURN     MOS13450
0D36  4846 0000                 1346          LH    R4,0(R6)          LOAD DATA FROM LOC                      MOS13460
0D3A  0543                      1347          CLAR  R4,R3             IS DATA AT LOC. OK ?                    MOS13470
0D3C  2333                      1348          BES   RTN11             YES, BRANCH                             MOS13480
```

TEST 1

```
0D3E   41F0 1578          1349           BAL   LINK,ERROR          NO, ERROR                                  MOS13490
0D42   C160 0D26          1350  RTN11    BXLE  R6,READ11          CONTINUE UNTIL DONE                        MOS13500
0D46   4860 0B84          1351           LH    R6,LOLIM+6                                                     MOS13510
0D4A   2430               1352           LIS   R3,0                                                       MOS13520
                          1353  *                                                                          MOS13530
0D4C   4036 0000          1354  STORE10  STH   R3,0(R6)            STORE BACKGROUND OF ALL 0'S                MOS13540
0D50   C160 0D4C          1355           BXLE  R6,STORE10                                                   MOS13550
0D54   6110 0AE6          1356           AHM   R1,ERRNO             ERRNO = C'02'                           MOS13560
0D58   4860 0B84          1357           LH    R6,LOLIM+6                                                   MOS13570
                          1358  *                                                                          MOS13580
0D5C   94A6               1359  READ10   EXBR  R10,R6                                                     MOS13590
0D5E   981A               1360           WHR   R1,R10               DISPLAY ADDRESS UNDER TEST              MOS13600
0D60   C8F0 04A4          1361           LHI   LINK,TSTEND                                                  MOS13610
0D64   40F0 0A9A          1362           STH   LINK,BRKVECT                                                 MOS13620
0D68   41F0 08BE          1363           BAL   LINK,TSTBRK          IF "BREAK" GO TO TSTEND ELSE RETURN     MOS13630
0D6C   4846 0000          1364           LH    R4,0(R6)             LOAD DATA FROM LOC                      MOS13640
0D70   2333               1365           BZS   RTN10                IF DATA = 0, BRANCH (DATA OK)           MOS13650
0D72   41F0 1578          1366           BAL   LINK,ERROR           NO, ERROR                               MOS13660
0D76   C160 0D5C          1367  RTN10    BXLE  R6,READ10           CONTINUE UNTIL DONE                     MOS13670
                          1368  *                                                                          MOS13680
0D7A   4300 04A4          1369           B     TSTEND               END OF TEST (RETURN TO EXEC)            MOS13690
                          1370  *                                                                          MOS13700
                          1371  ************************************************************************    MOS13710
                          1372  *        END   TEST 1                                                      MOS13720
```

```
                                1374  *       TEST 2                  MARCHING PATTERN TEST                   MOS13740
                                1375  *                                                                       MOS13750
                                1376  *       PURPOSE:                                                        MOS13760
                                1377  *             THIS TEST CHECKS THAT THREE DIFFERENT BASE PATTERNS        MOS13770
                                1378  *             CAN BE WRITTEN, COMPLEMENTED, AND MARCHED THROUGH THE     MOS13780
                                1379  *             AVAILABLE MEMORY WITHOUT ERROR.                           MOS13790
                                1380  *                                                                       MOS13800
                                1381  *       ASSUMPTIONS:                                                    MOS13810
                                1382  *             MINIMUM 16KB MOS MEMORY                                   MOS13820
                                1383  *                                                                       MOS13830
                                1384  *       DESIGN SPECIFICATIONS:                                          MOS13840
                                1385  *             1. (IN ASCENDING ORDER) WRITE AND READ THE BASE PATTERN.   MOS13850
                                1386  *             2. (IN DESCENDING ORDER) WRITE AND READ THE                MOS13860
                                1387  *                COMPLEMENT PATTERN.                                    MOS13870
                                1388  *                                                                       MOS13880
                                1389  *       OPTIONS:                                                        MOS13890
                                1390  *             LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST               MOS13900
                                1391  *             HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST              MOS13910
                                1392  *             SCOPE - ERROR OPTION MODE                                 MOS13920
                                1393  *                 0 - PRINT ERROR DATA AND SKIP TO NEXT TEST            MOS13930
                                1394  *                 1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST    MOS13940
                                1395  *                 2 - PRINT ERROR DATA AND CONTINUE TEST                MOS13950
                                1396  *                 3 - PRINT ERROR DATA AND HALT                         MOS13960
                                1397  *                 4 - IGNORE ERROR                                      MOS13970
                                1398  *                 5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST        MOS13980
                                1399  *                                                                       MOS13990
                                1400  *       HOW TO RUN THE TEST:                                            MOS14000
                                1401  *             1. ENTER THE "LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA     MOS14010
                                1402  *                THE CONSOLE DEVICE.                                    MOS14020
                                1403  *             2. ENTER "RUN" AND THE TEST WILL EXECUTE.                 MOS14030

0D7E  2411                      1405  TEST2   LIS   R1,1            LOAD DISPLAY ADDRESS                    MOS14050
0D80  C840 0A20                 1406          LHI   R4,MM0                                                    MOS14060
0D84  4040 003E                 1407          STH   R4,X'3E'        SET NEW MM POINTER                      MOS14070
0D88  24A0                      1408          LIS   R10,0                                                     MOS14080
0D8A  25B1                      1409          LCS   R11,1                                                     MOS14090
0D8C  24D0                      1410          LIS   R13,0           W/BACKGROUND = 0'S                      MOS14100
0D8E  41E0 0DBC                 1411          BAL   R14,CHKLOC      DO A SINGLE DISTURB TEST (MIN-MAX)      MOS14110
                                1412  *                                                                       MOS14120
0D92  25A1                      1413          LCS   R10,1                                                     MOS14130
0D94  24B0                      1414          LIS   R11,0           W/BACKGROUND = 1'S                      MOS14140
0D96  41E0 0DBC                 1415          BAL   R14,CHKLOC      DO A SINGLE DISTURB TEST (MIN-MAX)      MOS14150
                                1416  *                                                                       MOS14160
0D9A  24D2                      1417          LIS   R13,2           W/BACKGROUND = A'S                      MOS14170
0D9C  41E0 0DBC                 1418          BAL   R14,CHKLOC      DO A SINGLE DISTURB TEST (MIN-MAX)      MOS14180
                                1419  *                                                                       MOS14190
0DA0  24A0                      1420          LIS   R10,0                                                     MOS14200
0DA2  25B1                      1421          LCS   R11,1           W/BACKGROUND = 5'S                      MOS14210
0DA4  41E0 0DBC                 1422          BAL   R14,CHKLOC      DO A SINGLE DISTURB TEST (MIN-MAX)      MOS14220
                                1423  *                                                                       MOS14230
0DA8  C8D0 0080                 1424          LHI   R13,X'80'       W/BACKGROUND = 64-0'S, 64-1'S, ETC      MOS14240
```

TEST 2

```
0DAC  41E0 0DBC          1425          BAL   R14,CHKLOC        DO A SINGLE DISTURB TEST (MIN-MAX)     MOS14250
                         1426  *                                                                      MOS14260
0DB0  25A1               1427          LCS   R10,1                                                  MOS14270
0DB2  24B0               1428          LIS   R11,0             W/BACKGROUND = 64-1'S, 64-0'S, ETC     MOS14280
0DB4  41E0 0DBC          1429          BAL   R14,CHKLOC        DO A SINGLE DISTURB TEST (MIN-MAX)     MOS14290
                         1430  *                                                                      MOS14300
0DB8  4300 04A4          1431          B     TSTEND            END OF TEST (RETURN TO EXEC)           MOS14310
                         1432  *                                                                      MOS14320
                         1433  ************************************************************************MOS14330
                         1434  *                                                                      MOS14340
0DBC  4860 0B84          1435  CHKLOC  LH    R6,LOLIM+6        INITIALIZE MEMORY LIMITS               MOS14350
0DC0  4880 0B90          1436          LH    R8,HILIM+6                                               MOS14360
0DC4  2472               1437          LIS   R7,2                                                   MOS14370
                         1438  *                                                                      MOS14380
0DC6  083A               1439  CHKLOC1 LDAR  R3,R10            STORE APPROPRIATE BACKGROUND PATTERN   MOS14390
0DC8  C36D 0000          1440          THI   R6,0(R13)                                              MOS14400
0DCC  2332               1441          BZS   CHKLOC2                                                MOS14410
0DCE  083B               1442          LDAR  R3,R11                                                 MOS14420
0DD0  4036 0000          1443  CHKLOC2 STH   R3,0(R6)          IN MEMORY                            MOS14430
0DD4  C160 0DC6          1444          BXLE  R6,CHKLOC1        FROM LOLIM TO HILIM                  MOS14440
0DD8  4860 0B84          1445          LH    R6,LOLIM+6                                             MOS14450
                         1446  *                                                                      MOS14460
0DDC  C840 3033          1447  CHKLOC3 LHI   R4,C'03'                                               MOS14470
0DE0  4040 0AE6          1448          STH   R4,ERRNO          ERRNO = C'03'                        MOS14480
0DE4  94C6               1449          EXBR  R12,R6                                                 MOS14490
0DE6  981C               1450          WHR   R1,R12            DISPLAY ADDRESS UNDER TEST           MOS14500
0DE8  C8F0 04A4          1451          LHI   LINK,TSTEND                                            MOS14510
0DEC  40F0 0A9A          1452          STH   LINK,BRKVECT                                           MOS14520
0DF0  41F0 08BE          1453          BAL   LINK,TSTBRK       IF "BREAK" GO TO TSTEND ELSE RETURN  MOS14530
0DF4  083A               1454          LDAR  R3,R10            GET APPROPRIATE BACKGROUND PATTERN   MOS14540
0DF6  C36D 0000          1455          THI   R6,0(R13)                                              MOS14550
0DFA  2332               1456          BZS   CHKLOC4                                                MOS14560
0DFC  083B               1457          LDAR  R3,R11                                                 MOS14570
0DFE  4846 0000          1458  CHKLOC4 LH    R4,0(R6)          GET DATA FROM LOC UNDER TEST         MOS14580
0E02  0543               1459          CLAR  R4,R3             EQUAL ?                              MOS14590
0E04  2333               1460          BES   CHKLOC5           YES, BRANCH                          MOS14600
0E06  41F0 1578          1461          BAL   LINK,ERROR        NO, ERROR                            MOS14610
0E0A  C730 FFFF          1462  CHKLOC5 XHI   R3,-1            COMPLEMENT DATA PATTERN              MOS14620
0E0E  4036 0000          1463          STH   R3,0(R6)          STORE C.D.P. AT LOC                  MOS14630
0E12  6110 0AE6          1464          AHM   R1,ERRNO          ERRNO = C'04'                        MOS14640
0E16  4846 0000          1465          LH    R4,0(R6)          GET DATA FROM LOC UNDER TEST         MOS14650
0E1A  0543               1466          CLAR  R4,R3             DATA = C.D.P. ?                      MOS14660
0E1C  2333               1467          BES   CHKLOC6           YES, BRANCH                          MOS14670
0E1E  41F0 1578          1468          BAL   LINK,ERROR        NO, ERROR                            MOS14680
0E22  C160 0DDC          1469  CHKLOC6 BXLE  R6,CHKLOC3        CONTINUE UNTIL DONE(INCREMENTING)    MOS14690
0E26  4860 0B90          1470          LH    R6,HILIM+6                                             MOS14700
0E2A  C460 FFFE          1471          NHI   R6,X'FFFE'                                             MOS14710
0E2E  4880 0B84          1472          LH    R8,LOLIM+6        ESTABLISH MEMORY LIMITS              MOS14720
0E32  2781               1473          SIS   R8,1                                                   MOS14730
0E34  2572               1474          LCS   R7,2                                                   MOS14740
                         1475  *                                                                      MOS14750
0E36  083B               1476  CHKLOC7 LDAR  R3,R11            GET C.D.P. FOR LOC UNDER TEST        MOS14760
0E38  C36D 0000          1477          THI   R6,0(R13)                                              MOS14770
```

TEST 2

```
0E3C  2332           1478          BZS   CHKLOC8                                          MOS14780
0E3E  083A           1479          LDAR  R3,R10                                           MOS14790
0E40  C840 3035      1480  CHKLOC8 LHI   R4,C'05'                                        MOS14800
0E44  4040 0AE6      1481          STH   R4,ERRNO          ERRNO = C'05'                  MOS14810
0E48  94C6           1482          EXBR  R12,R6                                           MOS14820
0E4A  981C           1483          WHR   R1,R12            DISPLAY ADDRESS UNDER TEST     MOS14830
0E4C  C8F0 04A4      1484          LHI   LINK,TSTEND                                      MOS14840
0E50  40F0 0A9A      1485          STH   LINK,BRKVECT                                     MOS14850
0E54  41F0 08BE      1486          BAL   LINK,TSTBRK       IF "BREAK" GO TO TSTEND ELSE RETURN MOS14860
0E58  4846 0000      1487          LH    R4,0(R6)          GET DATA FROM LOC UNDER TEST   MOS14870
0E5C  0543           1488          CLAR  R4,R3             DATA = C.D.P. ?                MOS14880
0E5E  2333           1489          BES   CHKLOC9           YES, BRANCH                    MOS14890
0E60  41F0 1578      1490          BAL   LINK,ERROR         NO, ERROR                      MOS14900
0E64  C730 FFFF      1491  CHKLOC9 XHI   R3,-1             COMPLEMENT C.D.P. (O.D.P.)     MOS14910
0E68  4036 0000      1492          STH   R3,0(R6)          STORE PATTERN AT LOC           MOS14920
0E6C  6110 0AE6      1493          AHM   R1,ERRNO          ERRNO = C'06'                  MOS14930
0E70  4846 0000      1494          LH    R4,0(R6)          GET DATA FROM LOC UNDER TEST   MOS14940
0E74  0543           1495          CLAR  R4,R3             DATA = O.D.P. ?                MOS14950
0E76  2333           1496          BES   CHKLOC10          YES, BRANCH                    MOS14960
0E78  41F0 1578      1497          BAL   LINK,ERROR        NO, ERROR                      MOS14970
0E7C  C060 0E36      1498  CHKLOC10 BXH  R6,CHKLOC7        CONTINUE UNTIL DONE(DECREMENTING) MOS14980
                     1499  *                                                              MOS14990
0E80  030E           1500          BR    R14               RETURN                         MOS15000
                     1501  *                                                              MOS15010
                     1502  ********************************************************************** MOS15020
                     1503  *       END   TEST 2                                           MOS15030
```

TEST 3

```
                        1505  *       TEST 3                  0 & 1 WALK TEST                          MOS15050
                        1506  *                                                                        MOS15060
                        1507  *       PURPOSE:                                                         MOS15070
                        1508  *             THIS TEST WALKS A 0 THROUGH A FIELD OF 1'S AND A 1         MOS15080
                        1509  *             THROUGH A FIELD OF 0'S.                                    MOS15090
                        1510  *                                                                        MOS15100
                        1511  *       ASSUMPTIONS:                                                     MOS15110
                        1512  *             MINIMUM 16KB MOS MEMORY                                    MOS15120
                        1513  *                                                                        MOS15130
                        1514  *       DESIGN SPECIFICATIONS:                                           MOS15140
                        1515  *             1. WITH A BACKGROUND OF ALL 1'S, A 0 IS WALKED THROUGH      MOS15150
                        1516  *                EACH HALFWORD OF MEMORY. A READ AND COMPARE IS DONE      MOS15160
                        1517  *                ON EACH LOCATION.                                       MOS15170
                        1518  *             2. WITH A BACKGROUND OF ALL 0'S, A 1 IS WALKED THROUGH      MOS15180
                        1519  *                EACH HALFWORD OF MEMORY. A COMPARE IS DONE ON EACH       MOS15190
                        1520  *                LOCATION.                                               MOS15200
                        1521  *                                                                        MOS15210
                        1522  *       OPTIONS:                                                         MOS15220
                        1523  *             LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                MOS15230
                        1524  *             HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST               MOS15240
                        1525  *             SCOPE - ERROR OPTION MODE                                  MOS15250
                        1526  *                 0 - PRINT ERROR DATA AND SKIP TO NEXT TEST             MOS15260
                        1527  *                 1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST     MOS15270
                        1528  *                 2 - PRINT ERROR DATA AND CONTINUE TEST                 MOS15280
                        1529  *                 3 - PRINT ERROR DATA AND HALT                          MOS15290
                        1530  *                 4 - IGNORE ERROR                                       MOS15300
                        1531  *                 5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST         MOS15310
                        1532  *                                                                        MOS15320
                        1533  *       HOW TO RUN THE TEST:                                             MOS15330
                        1534  *             1. ENTER THE "LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA      MOS15340
                        1535  *                THE CONSOLE DEVICE.                                     MOS15350
                        1536  *             2. ENTER "RUN" AND THE TEST WILL EXECUTE.                   MOS15360

0E82  2411            1538  TEST3   LIS   R1,1             LOAD DISPLAY ADDRESS                     MOS15380
0E84  4860 0B84       1539          LH    R6,LOLIM+6        INITIALIZE MEMORY LIMITS                 MOS15390
0E88  4880 0B90       1540          LH    R8,HILIM+6                                                 MOS15400
0E8C  2472            1541          LIS   R7,2                                                       MOS15410
0E8E  C840 0A20       1542          LHI   R4,MM0                                                     MOS15420
0E92  4040 003E       1543          STH   R4,X'3E'          SET NEW MM POINTER                       MOS15430
0E96  2531            1544          LCS   R3,1                                                       MOS15440
                      1545  *                                                                        MOS15450
0E98  4036 0000       1546  STORE31 STH   R3,0(R6)          STORE BACKGROUND OF ALL 1'S              MOS15460
0E9C  C160 0E98       1547          BXLE  R6,STORE31                                                 MOS15470
0EA0  4860 0B84       1548          LH    R6,LOLIM+6                                                 MOS15480
0EA4  C840 3037       1549          LHI   R4,C'07'                                                   MOS15490
0EA8  4040 0AE6       1550          STH   R4,ERRNO          ERRNO = C'07'                            MOS15500
                      1551  *                                                                        MOS15510
0EAC  C8D0 0010       1552  T3S1    LHI   R13,16                                                     MOS15520
0EB0  94A6            1553          EXBR  R10,R6                                                     MOS15530
0EB2  981A            1554          WHR   R1,R10            DISPLAY ADDRESS UNDER TEST               MOS15540
0EB4  C8F0 04A4       1555          LHI   LINK,TSTEND                                                MOS15550
```

TEST 3

```
0EB8   40F0 0A9A          1556           STH   LINK,BRKVECT                                          MOS15560
0EBC   41F0 08BE          1557           BAL   LINK,TSTBRK          IF "BREAK" GO TO TSTEND ELSE RETURN MOS15570
0EC0   C8C0 8000          1558           LHI   R12,X'8000'          LOAD R12 (BIT 0 SET)              MOS15580
0EC4   2531               1559  T3S2     LCS   R3,1                 SET ALL BITS IN R3                MOS15590
0EC6   073C               1560           XAR   R3,R12               RESET A BIT (0-15) IN R3          MOS15600
0EC8   4036 0000          1561           STH   R3,0(R6)             STORE DATA AT LOC                 MOS15610
0ECC   4846 0000          1562           LH    R4,0(R6)             GET DATA FROM LOC                 MOS15620
0ED0   0543               1563           CLAR  R4,R3                DATA EQUAL ?                      MOS15630
0ED2   2333               1564           BES   T3S3                 YES, BRANCH                       MOS15640
0ED4   41F0 1578          1565           BAL   LINK,ERROR           NO, ERROR                         MOS15650
0ED8   90C1               1566  T3S3     SRHLS R12,1                WALK 0 THRU HALFWORD OF 1'S       MOS15660
0EDA   27D1               1567           SIS   R13,1                DONE W/THIS HALFWORD ?            MOS15670
0EDC   203C               1568           BNZS  T3S2                 NO, BRANCH UNTIL FINISHED         MOS15680
0EDE   C160 0EAC          1569           BXLE  R6,T3S1              CONTINUE UNTIL DONE (INCREMENTING MOS15690
0EE2   4860 0B84          1570           LH    R6,LOLIM+6                                             MOS15700
0EE6   2430               1571           LIS   R3,0                                                   MOS15710
                          1572  *                                                                      MOS15720
0EE8   4036 0000          1573  STORE30  STH   R3,0(R6)             STORE BACKGROUND OF ALL 0'S       MOS15730
0EEC   C160 0EE8          1574           BXLE  R6,STORE30                                             MOS15740
0EF0   4860 0B84          1575           LH    R6,LOLIM+6                                             MOS15750
0EF4   6110 0AE6          1576           AHM   R1,ERRNO             ERRNO = C'08'                     MOS15760
                          1577  *                                                                      MOS15770
0EF8   C8D0 0010          1578  T3S4     LHI   R13,16                                                 MOS15780
0EFC   94A6               1579           EXBR  R10,R6                                                 MOS15790
0EFE   981A               1580           WHR   R1,R10               DISPLAY ADDRESS UNDER TEST        MOS15800
0F00   C8F0 04A4          1581           LHI   LINK,TSTEND                                            MOS15810
0F04   40F0 0A9A          1582           STH   LINK,BRKVECT                                           MOS15820
0F08   41F0 08BE          1583           BAL   LINK,TSTBRK          IF "BREAK" GO TO TSTEND ELSE RETURN MOS15830
0F0C   C830 8000          1584           LHI   R3,X'8000'           LOAD R3 (BIT 0 SET)               MOS15840
                          1585  *                                                                      MOS15850
0F10   4036 0000          1586  T3S5     STH   R3,0(R6)             STORE DATA AT LOC                 MOS15860
0F14   4846 0000          1587           LH    R4,0(R6)             GET DATA FROM LOC                 MOS15870
0F18   0543               1588           CLAR  R4,R3                DATA EQUAL ?                      MOS15880
0F1A   2333               1589           BES   T3S6                 YES, BRANCH                       MOS15890
0F1C   41F0 1578          1590           BAL   LINK,ERROR           NO, ERROR                         MOS15900
0F20   9031               1591  T3S6     SRHLS R3,1                 WALK BIT THRU HALFWORD            MOS15910
0F22   27D1               1592           SIS   R13,1                DONE W/THIS HALFWORD ?            MOS15920
0F24   203A               1593           BNZS  T3S5                 NO, BRANCH UNTIL FINISHED         MOS15930
0F26   C160 0EF8          1594           BXLE  R6,T3S4              CONTINUE UNTIL DONE (INCREMENTING) MOS15940
                          1595  *                                                                      MOS15950
0F2A   4300 04A4          1596           B     TSTEND               END OF TEST (RETURN TO EXEC)      MOS15960
                          1597  ********************************************************************** MOS15970
                          1598  *        END   TEST 3                                                  MOS15980
```

TEST 4

```
                        1600  *       TEST 4                    DOUBLE OPERATION COLUMN DISTURB TEST   MOS16000
                        1601  *                                                                        MOS16010
                        1602  *       PURPOSE:                                                         MOS16020
                        1603  *             THIS TEST CHECKS THAT A DOUBLE OPERATION ON AN ADJACENT     MOS16030
                        1604  *             COLUMN DOES NOT DISTURB THE TEST COLUMN.                   MOS16040
                        1605  *                                                                        MOS16050
                        1606  *       ASSUMPTIONS:                                                     MOS16060
                        1607  *             MINIMUM 16 KB MOS MEMORY                                   MOS16070
                        1608  *                                                                        MOS16080
                        1609  *       DESIGN SPECIFICATIONS:                                           MOS16090
                        1610  *             1. WITH 6 DIFFERENT BACKROUND PATTERSN, A W-R-WC-           MOS16100
                        1611  *                RC-W-R-WC-RC SERIES IS EXECUTED AT EACH LOCATION.       MOS16110
                        1612  *             2. A COMPARE IS DONE UPON EACH READ OPERATION.              MOS16120
                        1613  *             3. A TEST (COMPARISON) OF THE REST OF MEMORY IS DONE        MOS16130
                        1614  *                AFTER EACH SERIES OF OPERATIONS.                        MOS16140
                        1615  *                                                                        MOS16150
                        1616  *       OPTIONS:                                                         MOS16160
                        1617  *             LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                MOS16170
                        1618  *             HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST               MOS16180
                        1619  *             SCOPE - ERROR OPTION MODE                                  MOS16190
                        1620  *                 0 - PRINT ERROR DATA AND SKIP TO NEXT TEST             MOS16200
                        1621  *                 1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST     MOS16210
                        1622  *                 2 - PRINT ERROR DATA AND CONTINUE TEST                 MOS16220
                        1623  *                 3 - PRINT ERROR DATA AND HALT                          MOS16230
                        1624  *                 4 - IGNORE ERROR                                       MOS16240
                        1625  *                 5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST         MOS16250
                        1626  *                                                                        MOS16260
                        1627  *       HOW TO RUN THE TEST                                              MOS16270
                        1628  *             1. ENTER THE "LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA      MOS16280
                        1629  *                THE CONSOLE DEVICE.                                     MOS16290
                        1630  *             2. ENTER "RUN" AND THE TEST WILL EXECUTE.                  MOS16300

0F2E  2411              1632  TEST4   LIS   R1,1             LOAD DISPLAY ADDRESS                   MOS16320
0F30  24A0              1633          LIS   R10,0                                                    MOS16330
0F32  25B1              1634          LCS   R11,1                                                    MOS16340
0F34  24D0              1635          LIS   R13,0             W/BACKGROUND = 0'S                     MOS16350
0F36  41E0 0F4C         1636          BAL   R14,CHKCOL        DO A DOUBLE OPERATION COLUMN           MOS16360
                        1637  *                               DISTURB AND COMPLEMENT TEST            MOS16370
0F3A  24D2              1638          LIS   R13,2             W/BACKGROUND = 5'S                     MOS16380
0F3C  41E0 0F4C         1639          BAL   R14,CHKCOL        DO A DOUBLE OPERATION COLUMN           MOS16390
                        1640  *                               DISTURB AND COMPLEMENT TEST            MOS16400
0F40  C8D0 0080         1641          LHI   R13,X'80'         W/BACKGROUND = 64-0'S, 64-1'S, ETC.    MOS16410
0F44  41E0 0F4C         1642          BAL   R14,CHKCOL        DO A DOUBLE OPERATION COLUMN           MOS16420
                        1643  *                               DISTURB AND COMPLEMENT TEST            MOS16430
0F48  4300 04A4         1644          B     TSTEND            END OF TEST (RETURN TO EXEC)           MOS16440
                        1645  *                                                                        MOS16450
                        1646  ************************************************************************ MOS16460
                        1647  *                                                                        MOS16470
0F4C  4860 0B84         1648  CHKCOL  LH    R6,LOLIM+6        INITIALIZE MEMORY LIMITS               MOS16480
0F50  4880 0B90         1649          LH    R8,HILIM+6                                               MOS16490
0F54  2472              1650          LIS   R7,2                                                     MOS16500
```

TEST 4

```
                         1651  *                                                                  MOS16510
0F56   083A              1652  CHKCOL1  LDAR  R3,R10          GET PROPER BACKGROUND PATTERN       MOS16520
0F58   C36D 0000         1653           THI   R6,0(R13)                                          MOS16530
0F5C   2332              1654           BZS   CHKCOL2                                            MOS16540
0F5E   083B              1655           LDAR  R3,R11                                             MOS16550
0F60   4036 0000         1656  CHKCOL2  STH   R3,0(R6)         STORE BACKGROUND PATTERN            MOS16560
0F64   C160 0F56         1657           BXLE  R6,CHKCOL1       TO ALL OF MEMORY UNDER TEST         MOS16570
0F68   4860 0B84         1658           LH    R6,LOLIM+6                                         MOS16580
                         1659  *                                                                  MOS16590
0F6C   C840 3033         1660  CHKCOL3  LHI   R4,C'03'                                          MOS16600
0F70   4040 0AE6         1661           STH   R4,ERRNO         ERRNO = C'03'                       MOS16610
0F74   94C6              1662           EXBR  R12,R6                                             MOS16620
0F76   981C              1663           WHR   R1,R12           DISPLAY ADDRESS UNDER TEST          MOS16630
0F78   C8F0 04A4         1664           LHI   LINK,TSTEND                                        MOS16640
0F7C   40F0 0A9A         1665           STH   LINK,BRKVECT                                       MOS16650
0F80   41F0 08BE         1666           BAL   LINK,TSTBRK      IF "BREAK" GO TO TSTEND ELSE RETURN MOS16660
0F84   083A              1667           LDAR  R3,R10           GET ORIGINAL DATA PATTERN (O.D.P.)  MOS16670
0F86   C36D 0000         1668           THI   R6,0(R13)                                          MOS16680
0F8A   2332              1669           BZS   CHKCOL4                                            MOS16690
0F8C   083B              1670           LDAR  R3,R11                                             MOS16700
0F8E   4846 0000         1671  CHKCOL4  LH    R4,0(R6)         GET DATA FROM LOC                   MOS16710
0F92   0543              1672           CLAR  R4,R3            DATA EQUAL ?                        MOS16720
0F94   2333              1673           BES   CHKCOL5          YES, BRANCH                         MOS16730
0F96   41F0 1578         1674           BAL   LINK,ERROR       NO, ERROR                           MOS16740
0F9A   C730 FFFF         1675  CHKCOL5  XHI   R3,-1            COMPLEMENT DATA PATTERN (C.D.P.)    MOS16750
0F9E   4036 0000         1676           STH   R3,0(R6)         STORE C.D.P. AT LOC                 MOS16760
0FA2   6110 0AE6         1677           AHM   R1,ERRNO         ERRNO = C'04'                       MOS16770
0FA6   4846 0000         1678           LH    R4,0(R6)         GET DATA FROM LOC                   MOS16780
0FAA   0543              1679           CLAR  R4,R3            DATA EQUAL ?                        MOS16790
0FAC   2333              1680           BES   CHKCOL6          YES, BRANCH                         MOS16800
0FAE   41F0 1578         1681           BAL   LINK,ERROR       NO, ERROR                           MOS16810
0FB2   C730 FFFF         1682  CHKCOL6  XHI   R3,-1            COMPLEMENT C.D.P. (O.D.P.)          MOS16820
0FB6   4036 0000         1683           STH   R3,0(R6)         STORE O.D.P. AT LOC                 MOS16830
0FBA   C840 3039         1684           LHI   R4,C'09'                                           MOS16840
0FBE   4040 0AE6         1685           STH   R4,ERRNO         ERRNO = C'09'                       MOS16850
0FC2   4846 0000         1686           LH    R4,0(R6)         GET DATA FROM LOC                   MOS16860
0FC6   0543              1687           CLAR  R4,R3            DATA EQUAL ?                        MOS16870
0FC8   2333              1688           BES   CHKCOL7          YES, BRANCH                         MOS16880
0FCA   41F0 1578         1689           BAL   LINK,ERROR       NO, ERROR                           MOS16890
0FCE   C730 FFFF         1690  CHKCOL7  XHI   R3,-1            COMPLEMENT O.D.P.(C.D.P.)           MOS16900
0FD2   4036 0000         1691           STH   R3,0(R6)         STORE C.D.P. AT LOC                 MOS16910
0FD6   C840 3041         1692           LHI   R4,C'0A'                                           MOS16920
0FDA   4040 0AE6         1693           STH   R4,ERRNO         ERRNO = C'0A'                       MOS16930
0FDE   4846 0000         1694           LH    R4,0(R6)         GET DATA FROM LOC                   MOS16940
0FE2   0543              1695           CLAR  R4,R3            DATA EQUAL ?                        MOS16950
0FE4   2333              1696           BES   CHKCOL8          YES, BRANCH                         MOS16960
0FE6   41F0 1578         1697           BAL   LINK,ERROR       NO, ERROR                           MOS16970
0FEA   C160 0F6C         1698  CHKCOL8  BXLE  R6,CHKCOL3       CONTINUE UNTIL DONE(INCREMENTING    MOS16980
0FEE   4860 0B90         1699           LH    R6,HILIM+6       INITIALIZE MEMORY LIMITS            MOS16990
0FF2   C460 FFFE         1700           NHI   R6,-2            (HILIM MUST BE EVEN)                MOS17000
0FF6   4880 0B84         1701           LH    R8,LOLIM+6                                         MOS17010
0FFA   2781              1702           SIS   R8,1                                               MOS17020
0FFC   2572              1703           LCS   R7,2                                               MOS17030
```

TEST 4

```
                         1704  *                                                                    MOS17040
0FFE   083B              1705  CHKCOL9  LDAR  R3,R11          GET COMPLEMENT DATA PATTERN(C.D.P.)    MOS17050
1000   C36D 0000         1706           THI   R6,0(R13)                                             MOS17060
1004   2332              1707           BZS   CHKCOLA                                               MOS17070
1006   083A              1708           LDAR  R3,R10                                                MOS17080
1008   C840 3035         1709  CHKCOLA  LHI   R4,C'05'                                              MOS17090
100C   4040 0AE6         1710           STH   R4,ERRNO        ERRNO = C'05'                         MOS17100
1010   94C6              1711           EXBR  R12,R6                                                MOS17110
1012   981C              1712           WHR   R1,R12          DISPLAY ADDRESS UNDER TEST            MOS17120
1014   C8F0 04A4         1713           LHI   LINK,TSTEND                                           MOS17130
1018   40F0 0A9A         1714           STH   LINK,BRKVECT                                          MOS17140
101C   41F0 08BE         1715           BAL   LINK,TSTBRK     IF "BREAK" GO TO TSTEND ELSE RETURN   MOS17150
1020   4846 0000         1716           LH    R4,0(R6)        GET DATA FROM LOC                     MOS17160
1024   0543              1717           CLAR  R4,R3           DATA EQUAL ?                          MOS17170
1026   2333              1718           BES   CHKCOLB         YES, BRANCH                           MOS17180
1028   41F0 1578         1719           BAL   LINK,ERROR      NO, ERROR                             MOS17190
102C   C730 FFFF         1720  CHKCOLB  XHI   R3,-1           COMPLEMENT C.D.P.(O.D.P.)             MOS17200
1030   4036 0000         1721           STH   R3,0(R6)        STORE O.D.P. AT LOC                   MOS17210
1034   6110 0AE6         1722           AHM   R1,ERRNO        ERRNO = C'06'                         MOS17220
1038   4846 0000         1723           LH    R4,0(R6)        GET DATA FROM LOC                     MOS17230
103C   0543              1724           CLAR  R4,R3           DATA EQUAL ?                          MOS17240
103E   2333              1725           BES   CHKCOLC         YES, BRANCH                           MOS17250
1040   41F0 1578         1726           BAL   LINK,ERROR      NO, ERROR                             MOS17260
1044   C730 FFFF         1727  CHKCOLC  XHI   R3,-1           COMPLEMENT O.D.P. (C.D.P.)            MOS17270
1048   4036 0000         1728           STH   R3,0(R6)        STORE C.D.P. AT LOC                   MOS17280
104C   C840 3042         1729           LHI   R4,C'0B'                                              MOS17290
1050   4040 0AE6         1730           STH   R4,ERRNO        ERRNO = C'0B'                         MOS17300
1054   4846 0000         1731           LH    R4,0(R6)        GET DATA FROM LOC                     MOS17310
1058   0543              1732           CLAR  R4,R3           DATA EQUAL ?                          MOS17320
105A   2333              1733           BES   CHKCOLD         YES, BRANCH                           MOS17330
105C   41F0 1578         1734           BAL   LINK,ERROR      NO, ERROR                             MOS17340
1060   C730 FFFF         1735  CHKCOLD  XHI   R3,-1           COMPLEMENT C.D.P.(O.D.P.)             MOS17350
1064   4036 0000         1736           STH   R3,0(R6)        STORE O.D.P. AT LOC                   MOS17360
1068   6110 0AE6         1737           AHM   R1,ERRNO        ERRNO = C'0C'                         MOS17370
106C   4846 0000         1738           LH    R4,0(R6)        GET DATA FROM LOC                     MOS17380
1070   0543              1739           CLAR  R4,R3           DATA EQUAL ?                          MOS17390
1072   2333              1740           BES   CHKCOLE         YES, BRANCH                           MOS17400
1074   41F0 1578         1741           BAL   LINK,ERROR      NO, ERROR                             MOS17410
1078   C060 0FFE         1742  CHKCOLE  BXH   R6,CHKCOL9      CONTINUE UNTIL DONE(DECREMENTING)     MOS17420
                         1743  *                                                                    MOS17430
107C   030E              1744           BR    R14             RETURN                                MOS17440
                         1745  *                                                                    MOS17450
                         1746  ********************************************************************  MOS17460
                         1747  *        END   TEST 4                                                MOS17470
```

TEST 5

```
                        1749  *       TEST 5                  SHORT COUNT RELOCATABLE          MOS17490
                        1750  *                               HAMMER DISTURB TEST              MOS17500
                        1751  *                                                                MOS17510
                        1752  *       PURPOSE:                                                 MOS17520
                        1753  *            THIS TEST EXECUTES A SMALL, RELOCATABLE PROGRAM      MOS17530
                        1754  *            (16 HALFWORDS) THROUGHOUT MEMORY, LOOKING FOR "SOFT" MOS17540
                        1755  *            FAILURES.                                           MOS17550
                        1756  *                                                                MOS17560
                        1757  *       ASSUMPTIONS:                                             MOS17570
                        1758  *            MINIMUM 16KB MOS MEMORY                             MOS17580
                        1759  *                                                                MOS17590
                        1760  *       DESIGN SPECIFICATIONS:                                   MOS17600
                        1761  *            1. THE TEST PROGRAM MUST USE 16 HALFWORDS HEAVILY,  MOS17610
                        1762  *               DUE TO THE INTERNAL CHIP ADDRESSING SCHEME.      MOS17620
                        1763  *            2. THE TEST RUNS WITH A BACKGROUND PATTERN EQUAL TO  MOS17630
                        1764  *               THE CONTENTS OF "DATA".                          MOS17640
                        1765  *            3. THE TEST LOOPS 10 TIMES(INTERNAL TO THE MODULE). MOS17650
                        1766  *            4. THE ROUTINE (ROUTIN) IS EXECUTED 10 TIMES. THE ENTIRE MOS17660
                        1767  *               ROUTINE IS THEN RELOCATED IN MEMORY AND EXECUTED 10 MOS17670
                        1768  *               TIMES. "ROUTIN" IS MOVED UP IN MEMORY UNTIL THE LAST MOS17680
                        1769  *               TEST HALFWORD IS IN THE LAST MEMORY HALFWORD.     MOS17690
                        1770  *                                                                MOS17700
                        1771  *       OPTIONS:                                                 MOS17710
                        1772  *            LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST         MOS17720
                        1773  *            HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST        MOS17730
                        1774  *            DATA  - 16-BIT DATA PATTERN USED AS BACKGROUND      MOS17740
                        1775  *            POUND - NUMBER OF TIMES A'S & 5'S ARE POUNDED IN MEMORY MOS17750
                        1776  *            SCOPE - ERROR OPTION MODE                           MOS17760
                        1777  *                0 - PRINT ERROR DATA AND SKIP TO NEXT TEST      MOS17770
                        1778  *                1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST MOS17780
                        1779  *                2 - PRINT ERROR DATA AND CONTINUE TEST          MOS17790
                        1780  *                3 - PRINT ERROR DATA AND HALT                   MOS17800
                        1781  *                4 - IGNORE ERROR                                MOS17810
                        1782  *                5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST  MOS17820
                        1783  *                                                                MOS17830
                        1784  *       HOW TO RUN THE TEST:                                     MOS17840
                        1785  *            1. ENTER THE"LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA MOS17850
                        1786  *               THE CONSOLE DEVICE.                              MOS17860
                        1787  *            2. ENTER "RUN" AND THE TEST WILL EXECUTE.           MOS17870

107E  4860 0B84         1789  TEST5   LH    R6,LOLIM+6          INITIALIZE MEMORY LIMITS     MOS17890
1082  4880 0B90         1790          LH    R8,HILIM+6                                       MOS17900
1086  0856              1791          LDAR  R5,R6                                            MOS17910
1088  0898              1792          LDAR  R9,R8                                            MOS17920
108A  2472              1793          LIS   R7,2                                             MOS17930
108C  2411              1794          LIS   R1,1                LOAD DISPLAY ADDRESS         MOS17940
108E  C8A0 5555         1795          LHI   R10,X'5555'                                      MOS17950
1092  C8B0 AAAA         1796          LHI   R11,X'AAAA'                                      MOS17960
1096  2521              1797          LCS   R2,1                                             MOS17970
                        1798  *                                                              MOS17980
1098  4026 0000         1799  T5S1    STH   R2,0(R6)            STORE BACKGROUND OF ALL 1'S  MOS17990
```

TEST 5

```
109C  C160 1098          1800          BXLE  R6,T5S1                                                MOS18000
10A0  0865               1801          LDAR  R6,R5                                                   MOS18010
10A2  41E0 10BC          1802          BAL   R14,SFTSET          DO SHORT HAMMER DISTURB TEST        MOS18020
                         1803  *                                                                     MOS18030
10A6  0865               1804          LDAR  R6,R5               INITIALIZE MEMORY LIMITS            MOS18040
10A8  2420               1805          LIS   R2,0                                                    MOS18050
                         1806  *                                                                     MOS18060
10AA  4026 0000          1807  T5S2    STH   R2,0(R6)            STORE BACKGROUND OF ALL 0'S         MOS18070
10AE  C160 10AA          1808          BXLE  R6,T5S2                                                 MOS18080
10B2  0865               1809          LDAR  R6,R5                                                   MOS18090
10B4  41E0 10BC          1810          BAL   R14,SFTSET          DO SHORT HAMMER DISTURB TEST        MOS18100
                         1811  *                                                                     MOS18110
10B8  4300 04A4          1812          B     TSTEND              END OF TEST (RETURN TO EXEC)        MOS18120
                         1813  *                                                                     MOS18130
                         1814  ************************************************************************MOS18140
                         1815  *                                                                     MOS18150
10BC  48C0 0B78          1816  SFTSET  LH    R12,POUND+6         LOAD EXECUTION COUNTER              MOS18160
10C0  94F6               1817          EXBR  R15,R6                                                  MOS18170
10C2  981F               1818          WHR   R1,R15              DISPLAY ADDRESS UNDER TEST          MOS18180
10C4  C8F0 04A4          1819          LHI   LINK,TSTEND                                             MOS18190
10C8  40F0 0A9A          1820          STH   LINK,BRKVECT                                            MOS18200
10CC  41F0 08BE          1821          BAL   LINK,TSTBRK         IF "BREAK" GO TO TSTEND ELSE RETURN MOS18210
10D0  D000 17A8          1822          STM   R0,MOSSAVE+32       SAVE REGISTERS 0-F                  MOS18220
10D4  0816               1823          LDAR  R1,R6                                                   MOS18230
10D6  D120 114E          1824          LM    R2,STLOOP           RELOCATE PROGRAM IN MEMORY          MOS18240
10DA  D021 FFE2          1825          STM   R2,STLOOP-ENDMOV5(R1)                                   MOS18250
10DE  48F0 116A          1826          LH    R15,STLOOP+28                                           MOS18260
10E2  40F1 FFFE          1827          STH   R15,STLOOP-ENDMOV5+28(R1)                               MOS18270
10E6  D100 17A8          1828          LM    R0,MOSSAVE+32       RESTORE REGISTERS 0-F               MOS18280
10EA  41D6 FFE2          1829          BAL   R13,STLOOP-ENDMOV5(R6) BRANCH TO "STLOOP"               MOS18290
                         1830  *                                                                     MOS18300
                         1831  *       TEST BACKGROUND PATTERN                                       MOS18310
                         1832  *                                                                     MOS18320
10EE  D000 17A8          1833  BGTST   STM   R0,MOSSAVE+32                                          MOS18330
10F2  C840 3045          1834          LHI   R4,C'0E'                                                MOS18340
10F6  4040 0AE6          1835          STH   R4,ERRNO            ERRNO = C'0E'                       MOS18350
10FA  0832               1836          LDAR  R3,R2               LOAD BACKGROUND PATTERN             MOS18360
10FC  08C6               1837          LDAR  R12,R6              SAVE LOC UNDER TEST                 MOS18370
10FE  0886               1838          LDAR  R8,R6                                                   MOS18380
1100  CB80 0020          1839          SHI   R8,ENDMOV5-STLOOP+2 ESTABLISH START OF SUB-2            MOS18390
1104  0865               1840          LDAR  R6,R5               GET START OF BACKGROUND TEST AREA    MOS18400
1106  0568               1841          CLAR  R6,R8               IS LOLIM NOT < START OF SUB-2 ?      MOS18410
1108  238B               1842          BNLS  BGTST3              NO, BRANCH TO TEST HIGH MEMORY      MOS18420
110A  4846 0000          1843  BGTST1  LH    R4,0(R6)            GET DATA FROM BACKGROUND LOC        MOS18430
110E  0543               1844          CLAR  R4,R3               DATA EQUAL ?                        MOS18440
1110  2134               1845          BNES  BGTST2.5                                                MOS18450
1112  C160 110A          1846  BGTST2  BXLE  R6,BGTST1           CONTINUE LOW BACKGROUND TESTING     MOS18460
1116  2304               1847          BS    BGTST3                                                  MOS18470
                         1848  *                                                                     MOS18480
1118  41F0 1578          1849  BGTST2.5 BAL  LINK,ERROR          PRINT ERROR TTOE                    MOS18490
111C  2205               1850          BS    BGTST2                                                  MOS18500
                         1851  *                                                                     MOS18510
111E  086C               1852  BGTST3  LDAR  R6,R12              RESTORE LOC UNDER TEST              MOS18520
```

TEST 5

```
1120  2662           1853           AIS   R6,2              START AT LOC+2 AFTER SUB                MOS18530
1122  4330 1140      1854           BZ    BGTST6            IF ZERO, DONE                           MOS18540
1126  0889           1855           LDAR  R8,R9             GET END OF BACKGROUND TEST AREA         MOS18550
1128  0568           1856           CLAR  R6,R8             IS BG LOC < OR = TEST LOC ?             MOS18560
112A  238B           1857           BNLS  BGTST6            NO, BRANCH TO TEST NEXT LOC             MOS18570
112C  4846 0000      1858  BGTST4   LH    R4,0(R6)          GET DATA FROM BG LOC                    MOS18580
1130  0543           1859           CLAR  R4,R3             DATA EQUAL ?                            MOS18590
1132  2134           1860           BNES  BGTST5.5                                                  MOS18600
1134  C160 112C      1861  BGTST5   BXLE  R6,BGTST4         CONTINUE HIGH BACKGROUND TESTING        MOS18610
1138  2304           1862           BS    BGTST6                                                    MOS18620
                     1863  *                                                                       MOS18630
113A  41F0 1578      1864  BGTST5.5 BAL   LINK,ERROR        PRINT ERROR TTOE                        MOS18640
113E  2205           1865           BS    BGTST5                                                    MOS18650
                     1866  *                                                                       MOS18660
1140  D100 17A8      1867  BGTST6   LM    R0,MOSSAVE+32     RESTORE REGISTERS                       MOS18670
1144  4026 FFE2      1868  BGTST7   STH   R2,STLOOP-ENDMOV5(R6) RESTORE BACKGROUND PATRN AT LOC.     MOS18680
1148  C160 10BC      1869           BXLE  R6,SFTSET         CONTINUE UNTIL DONE (INCREMENTING)      MOS18690
114C  030E           1870           BR    R14                                                       MOS18700
                     1871  *                                                                       MOS18710
                     1872  ************************************************************************MOS18720
                     1873  *                                                                       MOS18730
114E  40A6 0000      1874  STLOOP   STH   R10,0(R6)         STORE FIRST DATA PATTERN                MOS18740
1152  45A6 0000      1875           CLH   R10,0(R6)         DATA EQUAL ?                            MOS18750
1156  4230 116C      1876           BNE   FITERR1           NO,BRANCH TO ERROR                      MOS18760
115A  40B6 0000      1877  LOPRTN1  STH   R11,0(R6)         YES, STORE SECOND DATA PATTERN          MOS18770
115E  45B6 0000      1878           CLH   R11,0(R6)         DATA EQUAL?                             MOS18780
1162  4230 1170      1879           BNE   FITERR2           NO, BRANCH TO ERROR                     MOS18790
1166  27C1           1880  LOPRTN2  SIS   R12,1            YES, DECREMENT POUND COUNTER            MOS18800
1168  203D           1881           BNZS  STLOOP            BRANCH IF NOT DONE                      MOS18810
116A  030D           1882           BR    R13               RETURN                                  MOS18820
      0000 116C      1883  ENDMOV5  EQU   *                 (R6)                                    MOS18830
                     1884  *                                                                       MOS18840
                     1885  ************************************************************************MOS18850
                     1886  *                                                                       MOS18860
116C  083A           1887  FITERR1  LDAR  R3,R10            LOAD EXPECTED DATA                      MOS18870
116E  2302           1888           BS    FITERR3                                                   MOS18880
                     1889  *                                                                       MOS18890
1170  083B           1890  FITERR2  LDAR  R3,R11                                                   MOS18900
                     1891  *                                                                       MOS18910
1172  C840 3044      1892  FITERR3  LHI   R4,C'0D'                                                 MOS18920
1176  4040 0AE6      1893           STH   R4,ERRNO          ERRNO = C'0D'                           MOS18930
117A  4846 0000      1894           LH    R4,0(R6)                                                  MOS18940
117E  41F0 1578      1895           BAL   LINK,ERROR                                                MOS18950
1182  4300 1144      1896           B     BGTST7            RETURN                                  MOS18960
                     1897  *                                                                       MOS18970
                     1898  ************************************************************************MOS18980
                     1899  *        END   TEST 5                                                   MOS18990
```

TEST 6

```
                        1901  *        TEST 6                    DIAGONAL GALPAT TEST                    MOS19010
                        1902  *                                                                          MOS19020
                        1903  *        PURPOSE:                                                          MOS19030
                        1904  *             THE TEST RUNS A GALLOPING PATTERN ON ALL DIAGONALS OF        MOS19040
                        1905  *             EACH 4K RAM AND CHECKS THAT NO BACKGROUND LOCATIONS          MOS19050
                        1906  *             HAVE CHANGED DURING THE DIAGONAL TEST.                       MOS19060
                        1907  *                                                                          MOS19070
                        1908  *        ASSUMPTIONS:                                                      MOS19080
                        1909  *             MINIMUM 16KB MOS MEMORY                                      MOS19090
                        1910  *                                                                          MOS19100
                        1911  *        DESIGN SPECIFICATIONS:                                            MOS19110
                        1912  *             1. THE TEST IS EXECUTED FOR EACH OF THE SIX BACKGROUND       MOS19120
                        1913  *                PATTERNS.                                                 MOS19130
                        1914  *             2. AN ALTERNATE R-W-R-W-R-W-R-W-R(ETC) IS DONE TO A TEST     MOS19140
                        1915  *                CELL AND FOLLOWING CELLS ON THE DIAGONAL SUCESSIVELY.     MOS19150
                        1916  *             3. THE TEST CELL IS MOVED ONE CELL UP THE DIAGONAL AND        MOS19160
                        1917  *                THE PROCEDURE IS REPEATED.                               MOS19170
                        1918  *             4. AFTER THE DIAGONAL IS COMPLETED, THE BACKROUND             MOS19180
                        1919  *                PATTERN IN THE REST OF EACH 4K CHIP AS TESTED.            MOS19190
                        1920  *             5. THE DIAGONAL IS THEN MOVED AND 2-4 IS REPEATED UNTIL       MOS19200
                        1921  *                ALL DIAGONALS HAVE BEEN TRAVERSED.                        MOS19210
                        1922  *                                                                          MOS19220
                        1923  *        OPTIONS:                                                          MOS19230
                        1924  *             LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                  MOS19240
                        1925  *             HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST                 MOS19250
                        1926  *             SCOPE - ERROR OPTION MODE                                    MOS19260
                        1927  *                 0 - PRINT ERROR DATA AND SKIP TO NEXT TEST               MOS19270
                        1928  *                 1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST       MOS19280
                        1929  *                 2 - PRINT ERROR DATA AND CONTINUE TEST                   MOS19290
                        1930  *                 3 - PRINT ERROR DATA AND HALT                            MOS19300
                        1931  *                 4 - IGNORE ERROR                                         MOS19310
                        1932  *                 5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST           MOS19320
                        1933  *                                                                          MOS19330
                        1934  *        HOW TO RUN THE TEST:                                              MOS19340
                        1935  *             1. ENTER THE "LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA       MOS19350
                        1936  *                THE CONSOLE DEVICE.                                       MOS19360
                        1937  *             2. ENTER "RUN" AND THE TEST WILL EXECUTE.                    MOS19370

1186  4810 0B84         1939  TEST6    LH    R1,LOLIM+6                                                  MOS19390
118A  C410 E000         1940           NHI   R1,X'E000'                                                  MOS19400
118E  4010 1780         1941           STH   R1,VLOLIM          ESTABLISH VIRTUAL LOLIM                  MOS19410
1192  2404              1942           LIS   R0,4                                                        MOS19420
1194  C820 172A         1943           LHI   R2,LOMSG                                                    MOS19430
1198  41F0 06F2         1944           BAL   LINK,HEXASC        INSERT VLOLIM IN MESSAGE                 MOS19440
119C  4810 0B90         1945           LH    R1,HILIM+6                                                  MOS19450
11A0  C410 E000         1946           NHI   R1,X'E000'                                                  MOS19460
11A4  C610 1FFF         1947           OHI   R1,X'1FFF'                                                  MOS19470
11A8  C820 172F         1948           LHI   R2,HIMSG                                                    MOS19480
11AC  41F0 06F2         1949           BAL   LINK,HEXASC        INSERT VHILIM IN MESSAGE                 MOS19490
11B0  C510 FFFF         1950           CLAI  R1,-1                                                       MOS19500
11B4  2132              1951           BNES  T6SX                                                        MOS19510
```

TEST 6

```
11B6  2712           1952           SIS   R1,2                                                  MOS19520
11B8  4010 1782      1953  T6SX     STH   R1,VHILIM          ESTABLISH VIRTUAL HILIM            MOS19530
11BC  C850 1710      1954           LDAI  R5,T6MSG                                              MOS19540
11C0  41F0 0752      1955           BAL   LINK,PRINT         PRINT LIMITS UNDER DIAG. GALPAT TEST MOS19550
11C4  C850 172A      1956           LDAI  R5,LOMSG                                              MOS19560
11C8  41F0 0752      1957           BAL   LINK,PRINT                                            MOS19570
11CC  2411           1958           LIS   R1,1               LOAD DISPLAY ADDRESS               MOS19580
11CE  C820 0082      1959           LHI   R2,X'82'           LOAD CELL INCREMENT VALUE          MOS19590
11D2  C890 007E      1960           LHI   R9,X'7E'           LOAD TOP OF COLUMN MASK VALUE      MOS19600
11D6  C8C0 1FFE      1961           LHI   R12,X'1FFE'        LOAD CHIP LIMIT MASK               MOS19610
11DA  24A0           1962           LIS   R10,0                                                 MOS19620
11DC  25B1           1963           LCS   R11,1                                                 MOS19630
11DE  24D0           1964           LIS   R13,0              W/BACKGROUND = 0'S                 MOS19640
11E0  41E0 120E      1965           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST            MOS19650
                     1966  *                                                                    MOS19660
11E4  25A1           1967           LCS   R10,1                                                 MOS19670
11E6  24B0           1968           LIS   R11,0              W/BACKGROUND = 1'S                 MOS19680
11E8  41E0 120E      1969           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST            MOS19690
                     1970  *                                                                    MOS19700
11EC  24D2           1971           LIS   R13,2              W/BACKGROUND = A'S/CHIP            MOS19710
11EE  41E0 120E      1972           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST            MOS19720
                     1973  *                                                                    MOS19730
11F2  24A0           1974           LIS   R10,0                                                 MOS19740
11F4  25B1           1975           LCS   R11,1              W/BACKGROUND = 5'S/CHIP            MOS19750
11F6  41E0 120E      1976           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST            MOS19760
                     1977  *                                                                    MOS19770
11FA  C8D0 0080      1978           LHI   R13,X'80'          W/BACKGROUND = 64-0'S, 64-1'S, ETC.. MOS19780
11FE  41E0 120E      1979           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST            MOS19790
                     1980  *                                                                    MOS19800
1202  25A1           1981           LCS   R10,1                                                 MOS19810
1204  24B0           1982           LIS   R11,0              W/BACKGROUND = 64-1'S, 64-0'S, ETC.. MOS19820
1206  41E0 120E      1983           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST            MOS19830
                     1984  *                                                                    MOS19840
120A  4300 04A4      1985           B     TSTEND             END OF TEST (RETURN TO EXEC)       MOS19850
                     1986  *                                                                    MOS19860
                     1987  ************************************************************************ MOS19870
                     1988  *                                                                    MOS19880
120E  4860 1780      1989  TEST6ALL LH    R6,VLOLIM          LOAD AVAILABLE MEMORY LIMITS       MOS19890
1212  4880 1782      1990           LH    R8,VHILIM                                             MOS19900
1216  2472           1991           LIS   R7,2                                                  MOS19910
                     1992  *                                                                    MOS19920
1218  083A           1993  T6S1     LDAR  R3,R10             GET APPROPRIATE BACKGROUND PATTERN MOS19930
121A  C36D 0000      1994           THI   R6,0(R13)                                             MOS19940
121E  2332           1995           BZS   T6S2                                                  MOS19950
1220  083B           1996           LDAR  R3,R11                                                MOS19960
1222  4036 0000      1997  T6S2     STH   R3,0(R6)           STORE BACKGROUND PATTERN           MOS19970
1226  C160 1218      1998           BXLE  R6,T6S1            TO ALL AVAILABLE MEMORY            MOS19980
122A  083A           1999           LDAR  R3,R10                                                MOS19990
122C  C36D 0000      2000           THI   R6,0(R13)                                             MOS20000
1230  2332           2001           BZS   T6S2.5                                                MOS20010
1232  083B           2002           LDAR  R3,R11                                                MOS20020
1234  4036 0000      2003  T6S2.5   STH   R3,0(R6)           STORE BG AT LAST LOC               MOS20030
1238  4850 1780      2004           LH    R5,VLOLIM          INITIALIZE BIAS                    MOS20040
```

TEST 6

```
                          2005  *                                                                    MOS20050
123C  2400                2006  T6S3      LIS   R0,0              R0 = X0                          MOS20060
123E  0880                2007  T6S4      LDAR  R8,R0             R8 = TEST CELL                   MOS20070
1240  0870                2008  T6S5      LDAR  R7,R0             R7 = RUNNING CELL                MOS20080
1242  0578                2009  T6S6      CLAR  R7,R8             RUNNING CELL = TEST CELL ?       MOS20090
1244  4330 1294           2010            BE    INCRRC            YES, INCREMENT THE RUNNING CELL  MOS20100
1248  0865                2011            LDAR  R6,R5             R5 = BIAS                        MOS20110
124A  0A68                2012            AAR   R6,R8             R6 = TEST CELL                   MOS20120
124C  94F6                2013            EXBR  R15,R6                                             MOS20130
124E  981F                2014            WHR   R1,R15            DISPLAY ADDRESS UNDER TEST       MOS20140
1250  083B                2015            LDAR  R3,R11            LOAD COMPLEMENT DATA PATTERN(C.D.P.) MOS20150
1252  C36D 0000           2016            THI   R6,0(R13)                                          MOS20160
1256  2332                2017            BZS   T6S7                                               MOS20170
1258  083A                2018            LDAR  R3,R10                                             MOS20180
125A  4036 0000           2019  T6S7      STH   R3,0(R6)          STORE C.D.P. AT TEST CELL LOC    MOS20190
125E  C840 3130           2020            LHI   R4,C'10'                                           MOS20200
1262  4040 0AE6           2021            STH   R4,ERRNO          ERRNO = C'10'                    MOS20210
1266  4846 0000           2022            LH    R4,0(R6)          GET TEST CELL DATA               MOS20220
126A  0543                2023            CLAR  R4,R3             DATA EQUAL TO C.D.P. ?           MOS20230
126C  4230 12A4           2024            BNE   T6ER10            NO, BRANCH - OTHERWISE           MOS20240
1270  4036 0000           2025  T6S8      STH   R3,0(R6)          STORE C.D.P. AT TC LOC           MOS20250
1274  0865                2026            LDAR  R6,R5             R5 = BIAS                        MOS20260
1276  0A67                2027            AAR   R6,R7             R6 = RUNNING CELL                MOS20270
1278  6110 0AE6           2028            AHM   R1,ERRNO          ERRNO = C'11'                    MOS20280
127C  083A                2029            LDAR  R3,R10            LOAD O.D.P. AT RUNNING CELL LOC  MOS20290
127E  C36D 0000           2030            THI   R6,0(R13)                                          MOS20300
1282  2332                2031            BZS   T6S9                                               MOS20310
1284  083B                2032            LDAR  R3,R11                                             MOS20320
1286  4846 0000           2033  T6S9      LH    R4,0(R6)          GET RUNNING CELL DATA            MOS20330
128A  0543                2034            CLAR  R4,R3             RC DATA = BACKGROUND DATA ?      MOS20340
128C  4230 12AC           2035            BNE   T6ER11            NO, BRANCH - OTHERWISE           MOS20350
1290  4036 0000           2036  T6S10     STH   R3,0(R6)          STORE O.D.P. AT RUNNING CELL LOC MOS20360
                          2037  *                                                                    MOS20370
1294  0867                2038  INCRRC    LDAR  R6,R7             R6 = RUNNING CELL                MOS20380
1296  0469                2039            NHR   R6,R9                                              MOS20390
1298  0569                2040            CLAR  R6,R9             RUNNING CELL = TOP OF COLUMN ?   MOS20400
129A  233D                2041            BES   INCRTC            YES, INCREMENT THE TEST CELL     MOS20410
129C  0A72                2042            AHR   R7,R2             NO, INCREMENT RUNNING CELL (+X'82') MOS20420
129E  047C                2043            NHR   R7,R12            STAY WITHIN CHIP (8KB)           MOS20430
12A0  4300 1242           2044            B     T6S6              CONTINUE TESTING                 MOS20440
                          2045  *                                                                    MOS20450
12A4  41F0 1578           2046  T6ER10    BAL   LINK,ERROR        PRINT ERROR TT10                 MOS20460
12A8  4300 1270           2047            B     T6S8              RETURN                           MOS20470
                          2048  *                                                                    MOS20480
12AC  41F0 1578           2049  T6ER11    BAL   LINK,ERROR        PRINT ERROR TT11                 MOS20490
12B0  4300 1290           2050            B     T6S10             RETURN                           MOS20500
                          2051  *                                                                    MOS20510
12B4  0865                2052  INCRTC    LDAR  R6,R5             R5 = BIAS                        MOS20520
12B6  0668                2053            OAR   R6,R8             R6 = TEST CELL                   MOS20530
12B8  083A                2054            LDAR  R3,R10            GET APPROPRIATE BACKGROUND PATTERN MOS20540
12BA  C36D 0000           2055            THI   R6,0(R13)                                          MOS20550
12BE  2332                2056            BZS   INCRTC1                                            MOS20560
12C0  083B                2057            LDAR  R3,R11                                             MOS20570
```

TEST 6

```
12C2  4036 0000          2058  INCRTC1  STH   R3,0(R6)          RESTORE TEST CELL TO BACKGROUND PATRN  MOS20580
12C6  0469               2059           NHR   R6,R9                                                  MOS20590
12C8  0569               2060           CLAR  R6,R9            TEST CELL = TOP OF COLUMN ?           MOS20600
12CA  2335               2061           BES   INCRX0           YES, INCREMENT X0                     MOS20610
12CC  0A82               2062           AHR   R8,R2            NO, INCREMENT TEST, CELL (+X'82')     MOS20620
12CE  048C               2063           NHR   R8,R12           STAY WITHIN CHIP (8KB)                MOS20630
12D0  4300 1240          2064           B     T6S5             CONTINUE TEST                         MOS20640
                         2065  *                                                                      MOS20650
12D4  C8F0 04A4          2066  INCRX0   LHI   LINK,TSTEND                                            MOS20660
12D8  40F0 0A9A          2067           STH   LINK,BRKVECT                                           MOS20670
12DC  41F0 08BE          2068           BAL   LINK,TSTBRK        IF "BREAK" GO TO TSTEND ELSE RETURN   MOS20680
12E0  D000 17A8          2069  CKBG60   STM   R0,MOSSAVE+32     SAVE REGISTERS                        MOS20690
12E4  0865               2070           LDAR  R6,R5            ESTABLISH LO OF 4K CHIP               MOS20700
12E6  0886               2071           LDAR  R8,R6                                                  MOS20710
12E8  C680 1FFE          2072           OAI   R8,X'1FFE'       ESTABLISH HI OF 4K CHIP               MOS20720
12EC  C580 FFFE          2073           CLAI  R8,-2                                                  MOS20730
12F0  2132               2074           BNES  CKBG66                                                 MOS20740
12F2  2781               2075           SIS   R8,1                                                   MOS20750
12F4  2472               2076  CKBG66   LIS   R7,2             LOAD INCREMENT VALUE                  MOS20760
12F6  C840 3045          2077           LHI   R4,C'0E'                                               MOS20770
12FA  4040 0AE6          2078           STH   R4,ERRNO         ERRNO = C'0E'                         MOS20780
                         2079  *                                                                      MOS20790
12FE  083A               2080  CKBG61   LDAR  R3,R10           GET APPROPRIATE BACKGROUND PATTERN    MOS20800
1300  C36D 0000          2081           THI   R6,0(R13)                                              MOS20810
1304  2332               2082           BZS   CKBG62                                                 MOS20820
1306  083B               2083           LDAR  R3,R11                                                 MOS20830
1308  4846 0000          2084  CKBG62   LH    R4,0(R6)          LOAD BACKGROUND PATTERN               MOS20840
130C  0543               2085           CLAR  R4,R3            DATA EQUAL ?                          MOS20850
130E  2134               2086           BNES  CKBG64           NO, BRANCH                            MOS20860
1310  C160 12FE          2087  CKBG63   BXLE  R6,CKBG61         CONTINUE UNTIL DONE                   MOS20870
1314  2304               2088           BS    CKBG65                                                 MOS20880
                         2089  *                                                                      MOS20890
1316  41F0 1578          2090  CKBG64   BAL   LINK,ERROR                                             MOS20900
131A  2205               2091           BS    CKBG63                                                 MOS20910
                         2092  *                                                                      MOS20920
131C  D100 17A8          2093  CKBG65   LM    R0,MOSSAVE+32     RESTORE REGISTERS                     MOS20930
1320  CA00 0080          2094           AHI   R0,X'80'          INCREMENT X0                          MOS20940
1324  C500 2000          2095           CLAI  R0,X'2000'       IS THIS THE LAST DIAGONAL ?           MOS20950
1328  4280 123E          2096           BL    T6S4             NO, BRANCH                            MOS20960
                         2097  *                                                                      MOS20970
132C  CA50 2000          2098  INCRBIAS AHI   R5,X'2000'        INCREMENT THE BIAS                    MOS20980
1330  033E               2099           BZR   R14              RETURN IF TEST HAS WRAPPED            MOS20990
1332  4550 1782          2100           CLH   R5,VHILIM        IS TEST DONE ?                        MOS21000
1336  4280 123C          2101           BL    T6S3             NO, CONTINUE TEST                     MOS21010
133A  030E               2102           BR    R14              YES, RETURN                           MOS21020
                         2103  *                                                                      MOS21030
                         2104  ************************************************************************MOS21040
                         2105  *        END   TEST 6                                                  MOS21050
```

TEST 7

```
                        2107  *       TEST 7                    MEMORY HOLD TEST                        MOS21070
                        2108  *                                                                         MOS21080
                        2109  *       PURPOSE                                                           MOS21090
                        2110  *            THIS TEST CHECKS THE ABILITY OF THE MOS MEMORY REFRESH      MOS21100
                        2111  *            CIRCUIT TO OPERATE IN THE EVENT OF A POWER FAILURE.         MOS21110
                        2112  *                                                                         MOS21120
                        2113  *       ASSUMPTIONS:                                                      MOS21130
                        2114  *            MINIMUM 16KB MOS MEMORY & BATTERY BACK-UP POWER SUPPLY.     MOS21140
                        2115  *                                                                         MOS21150
                        2116  *       DESIGN SPECIFICATIONS:                                            MOS21160
                        2117  *            1. A BACKGROUND PATTERN IS WRITTEN TO ALL MEMORY.           MOS21170
                        2118  *            2. POWER IS REMOVED FOR 30 SECONDS(MINIMUM).               MOS21180
                        2119  *            3. UPON RESTART, THE PROGRAM READS MEMORY 8 TIMES           MOS21190
                        2120  *               CHECKING FOR ERRORS.                                      MOS21200
                        2121  *                                                                         MOS21210
                        2122  *       OPTIONS                                                           MOS21220
                        2123  *            LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                MOS21230
                        2124  *            HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST               MOS21240
                        2125  *            SCOPE - ERROR OPTION MODE                                  MOS21250
                        2126  *                0 - PRINT ERROR DATA AND SKIP TO NEXT TEST             MOS21260
                        2127  *                1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST     MOS21270
                        2128  *                2 - PRINT ERROR DATA AND CONTINUE TEST                 MOS21280
                        2129  *                3 - PRINT ERROR DATA AND HALT                          MOS21290
                        2130  *                4 - IGNORE ERROR                                       MOS21300
                        2131  *                5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST         MOS21310
                        2132  *                                                                       MOS21320
                        2133  *       HOW TO RUN THE TEST:                                            MOS21330
                        2134  *            1. ENTER THE "LOLIM" AND "HILIM" OPTIONS VIA                MOS21340
                        2135  *               THE CONSOLE DEVICE.                                       MOS21350
                        2136  *            2. ENTER "RUN" AND THE TEST WILL EXECUTE.                   MOS21360

133C  4860 0B84         2138  TEST7     LH    R6,LOLIM+6          INITIALIZE MEMORY LIMITS            MOS21380
1340  4880 0B90         2139            LH    R8,HILIM+6                                              MOS21390
1344  2788              2140            SIS   R8,8                                                    MOS21400
1346  2478              2141            LIS   R7,8                                                    MOS21410
1348  2411              2142            LIS   R1,1                LOAD DISPLAY ADDRESS                MOS21420
134A  24A0              2143            LIS   R10,0               LOAD 4 DATA PATTERNS                MOS21430
134C  2531              2144            LCS   R11,1                                                   MOS21440
134E  C8C0 AAAA         2145            LHI   R12,X'AAAA'                                             MOS21450
1352  C8D0 5555         2146            LHI   R13,X'5555'                                             MOS21460
                        2147  *                                                                       MOS21470
1356  40A6 0000         2148  T7S1      STH   R10,0(R6)                                               MOS21480
135A  40B6 0002         2149            STH   R11,2(R6)                                               MOS21490
135E  40C6 0004         2150            STH   R12,4(R6)                                               MOS21500
1362  40D6 0006         2151            STH   R13,6(R6)           STORE DATA PATTERNS                 MOS21510
1366  C160 1356         2152            BXLE  R6,T7S1             FROM LOLIM TO HILIM                 MOS21520
136A  C850 13A2         2153            LHI   R5,T7MM1                                                MOS21530
136E  4050 003E         2154            STH   R5,X'3E'            SET VECTOR FOR MM                   MOS21540
                        2155  *                                     ON POWER DOWN                     MOS21550
                        2156  *                                                                       MOS21560
1372  C850 1736         2157  T7OUTMSG  LHI   R5,T7MSG            UNCONDITIONALLY PRINT:              MOS21570
```

TEST 7

```
1376  4050 0A9C          2158          STH   R5,ISITERR                                        MOS21580
137A  41F0 0752          2159          BAL   LINK,PRINT          "POWER DOWN PROC. FOR 30 SECONDS"  MOS21590
137E  2450               2160          LIS   R5,0                                              MOS21600
1380  4050 0A9C          2161          STH   R5,ISITERR                                        MOS21610
1384  25E1               2162          LCS   R14,1               ESTABLISH WAIT COUNTERS       MOS21620
1386  C820 0080          2163  T7S2    LHI   R2,128                                            MOS21630
                         2164  *                                                               MOS21640
138A  2721               2165  T7S3    SIS   R2,1                                             MOS21650
138C  2031               2166          BNZS  T7S3                WAIT 256* SF INSTRUCTION TIMES MOS21660
138E  C8F0 04A4          2167          LHI   LINK,TSTEND                                       MOS21670
1392  40F0 0A9A          2168          STH   LINK,BRKVECT                                      MOS21680
1396  41F0 08BE          2169          BAL   LINK,TSTBRK         IF "BREAK" GO TO TSTEND ELSE RETURN MOS21690
139A  27E1               2170          SIS   R14,1                                             MOS21700
139C  203B               2171          BNZS  T7S2                WAIT 30 SECONDS FOR MM        MOS21710
139E  4300 1372          2172          B     T7OUTMSG            ON POWER DOWN                 MOS21720
                         2173  *                                                               MOS21730
                         2174  ********************************************************************** MOS21740
                         2175  *                                                               MOS21750
13A2  C8E0 13B0          2176  T7MM1   LHI   R14,T7MM2           SET VECTOR FOR MM             MOS21760
13A6  40E0 003E          2177          STH   R14,X'3E'           ON POWER UP                   MOS21770
13AA  C8E0 80F0          2178          LHI   R14,X'80F0'                                       MOS21780
13AE  954E               2179          EPSR  R4,R14              WAIT FOR MM  (PSW = X'80F0')  MOS21790
                         2180  *                                                               MOS21800
                         2181  ********************************************************************** MOS21810
                         2182  *                                                               MOS21820
13B0  48E0 0108          2183  T7MM2   LH    R14,PSW2                                          MOS21830
13B4  950E               2184          EPSR  R0,R14              PSW = X'30F0'                 MOS21840
13B6  C840 0A20          2185          LHI   R4,MM0                                            MOS21850
13BA  4040 003E          2186          STH   R4,X'3E'            SET NEW MM POINTER            MOS21860
13BE  24E8               2187          LIS   R14,8               LOAD MEMORY CHECK COUNTER     MOS21870
13C0  C840 3230          2188          LHI   R4,C'20'                                          MOS21880
13C4  4040 0AE6          2189          STH   R4,ERRNO            ERRNO = C'20'                 MOS21890
13C8  2472               2190          LIS   R7,2                                              MOS21900
                         2191  *                                                               MOS21910
13CA  4860 0B84          2192  T7S4    LH    R6,LOLIM+6                                        MOS21920
13CE  6110 0AE6          2193          AHM   R1,ERRNO            INCREMENT ERRNO (21-28)       MOS21930
                         2194  *                                                               MOS21940
13D2  94F6               2195  T7S5    EXBR  LINK,R6                                           MOS21950
13D4  981F               2196          WHR   R1,LINK             DISPLAY ADDRESS UNDER TEST    MOS21960
13D6  083A               2197          LDAR  R3,R10              GET FIRST DATA PATTERN        MOS21970
13D8  4846 0000          2198          LH    R4,0(R6)            LOAD DATA FROM LOC            MOS21980
13DC  0543               2199          CLAR  R4,R3               DATA EQUAL ?                  MOS21990
13DE  2333               2200          BES   T7S6                YES, BRANCH                   MOS22000
13E0  41F0 1578          2201          BAL   LINK,ERROR          NO, ERROR                     MOS22010
13E4  083B               2202  T7S6    LDAR  R3,R11              GET SECOND DATA PATTERN       MOS22020
13E6  2662               2203          AIS   R6,2                INCREMENT LOC COUNTER         MOS22030
13E8  4846 0000          2204          LH    R4,0(R6)            LOAD DATA FROM LOC            MOS22040
13EC  0543               2205          CLAR  R4,R3               DATA EQUAL ?                  MOS22050
13EE  2333               2206          BES   T7S7                YES, BRANCH                   MOS22060
13F0  41F0 1578          2207          BAL   LINK,ERROR          NO, ERROR                     MOS22070
13F4  083C               2208  T7S7    LDAR  R3,R12              GET THIRD DATA PATTERN        MOS22080
13F6  2662               2209          AIS   R6,2                INCREMENT LOC COUNTER         MOS22090
13F8  4846 0000          2210          LH    R4,0(R6)            LOAD DATA FROM LOC            MOS22100
```

TEST 7

```
13FC   0543            2211           CLAR  R4,R3             DATA EQUAL ?                                MOS22110
13FE   2333            2212           BES   T7S8               YES, BRANCH                                 MOS22120
1400   41F0 1578       2213           BAL   LINK,ERROR         NO, ERROR                                   MOS22130
1404   083D            2214  T7S8     LDAR  R3,R13             GET FOURTH DATA PATTERN                     MOS22140
1406   2662            2215           AIS   R6,2               INCREMENT LOC COUNTER                       MOS22150
1408   4846 0000       2216           LH    R4,0(R6)           LOAD DATA FROM LOC                          MOS22160
140C   0543            2217           CLAR  R4,R3              DATA EQUAL ?                                MOS22170
140E   2333            2218           BES   T7S9               YES, BRANCH                                 MOS22180
1410   41F0 1578       2219           BAL   LINK,ERROR         NO, ERROR                                   MOS22190
1414   C160 13D2       2220  T7S9     BXLE  R6,T7S5            CHECK LOLIM TO HILIM                        MOS22200
1418   C8F0 04A4       2221           LHI   LINK,TSTEND                                                    MOS22210
141C   40F0 0A9A       2222           STH   LINK,BRKVECT                                                   MOS22220
1420   41F0 08BE       2223           BAL   LINK,TSTBRK         IF "BREAK" GO TO TSTEND ELSE RETURN         MOS22230
1424   27E1            2224           SIS   R14,1              CHECKED MEMORY 8 TIMES ?                    MOS22240
1426   4230 13CA       2225           BNZ   T7S4               NO, REPEATE                                 MOS22250
142A   4300 04A4       2226           B     TSTEND             YES, END OF TEST(RETURN TO EXEC)            MOS22260
                       2227  *                                                                             MOS22270
                       2228  ************************************************************************      MOS22280
                       2229  *        END   TEST 7                                                         MOS22290
```

TEST 8

```
                        2231  *       TEST 8 (OPTIONAL TEST)    LONG COUNT RELOCATABLE                MOS22310
                        2232  *                                 HAMMER DISTURB TEST                   MOS22320
                        2233  *                                                                       MOS22330
                        2234  *       PURPOSE:                                                        MOS22340
                        2235  *             THE TEST EXERCISES THE MOS MEMORY IN AN ENVIRONMENT       MOS22350
                        2236  *             SIMILAR TO THAT OF AN OPERATING SYSTEM.                   MOS22360
                        2237  *                                                                       MOS22370
                        2238  *       ASSUMPTIONS:                                                    MOS22380
                        2239  *             MINIMUM 16KB MOS MEMORY                                   MOS22390
                        2240  *                                                                       MOS22400
                        2241  *       DESIGN SPECIFICATIONS:                                          MOS22410
                        2242  *             THIS IS AN OVERNIGHT TEST DESIGNED TO POINT OUT           MOS22420
                        2243  *             POSSIBLE "SOFT" FAILURE LOCATIONS IN MOS MEMORY.          MOS22430
                        2244  *             (SIMILAR TO TEST 5)                                       MOS22440
                        2245  *                                                                       MOS22450
                        2246  *       OPTIONS:                                                        MOS22460
                        2247  *             LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST               MOS22470
                        2248  *             HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST              MOS22480
                        2249  *             DATA  - 16-BIT BACKGROUND DATA PATTERN                    MOS22490
                        2250  *             SCOPE - ERROR OPTION MODE                                 MOS22500
                        2251  *                 0 - PRINT ERROR DATA AND SKIP TO NEXT TEST            MOS22510
                        2252  *                 1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST    MOS22520
                        2253  *                 2 - PRINT ERROR DATA AND CONTINUE TEST                MOS22530
                        2254  *                 3 - PRINT ERROR DATA AND HALT                         MOS22540
                        2255  *                 4 - IGNORE ERROR                                      MOS22550
                        2256  *                 5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST        MOS22560
                        2257  *                                                                       MOS22570
                        2258  *       HOW TO RUN THE TEST:                                            MOS22580
                        2259  *             1. ENTER THE"LOLIM", "HILIM", AND "DATA" OPTIONS VIA      MOS22590
                        2260  *                THE CONSOLE DEVICE.                                    MOS22600
                        2261  *             2. ENTER "RUN" AND THE TEST WILL EXECUTE.                 MOS22610

142E  4850 0B84         2263  TEST8   LH    R6,LOLIM+6          INITIALIZE MEMORY LIMITS           MOS22630
1432  4880 0B90         2264          LH    R8,HILIM+6                                             MOS22640
1436  08A6              2265          LDAR  R10,R6                                                 MOS22650
1438  08B8              2266          LDAR  R11,R8                                                 MOS22660
143A  0878              2267          LDAR  R7,R8                                                  MOS22670
143C  0B76              2268          SAR   R7,R6                                                  MOS22680
143E  C570 0072         2269          CLAI  R7,ENDMOV8-MOVPRG+4 IS HILIM - LOLIM LARGE ENOUGH ?  MOS22690
1442  4280 1558         2270          BL    T8LOPRT             IF NOT, BRANCH AND PRINT ERROR     MOS22700
1446  2411              2271          LIS   R1,1                LOAD DISPLAY ADDRESS               MOS22710
1448  4850 0B6C         2272          LH    R5,DATA+6           LOAD BACKGROUND DATA PATTERN       MOS22720
144C  2472              2273          LIS   R7,2                                                   MOS22730
144E  C580 FFFF         2274          CLAI  R8,-1               HILIM = X'FFFF' ?                  MOS22740
1452  2132              2275          BNES  T8SW                NO, BRANCH                         MOS22750
1454  2782              2276          SIS   R8,2                YES, READY FOR BXLE W/O WRAP       MOS22760
                        2277  *                                                                      MOS22770
1456  4056 0000         2278  T8SW    STH   R5,0(R6)           STORE BACKGROUND DATA PATTERN      MOS22780
145A  C160 1456         2279          BXLE  R6,T8SW             FROM LOLIM TO HILIM                MOS22790
145E  4860 0B84         2280          LH    R6,LOLIM+6                                             MOS22800
                        2281  *                                                                      MOS22810
```

TEST 8

```
1462  D000 17A8          2282           STM   R0,MOSSAVE+32       SAVE REGISTERS (0-F)                          MOS22820
1466  0816               2283           LDAR  R1,R6                                                             MOS22830
1468  D120 14EA          2284           LM    R2,MOVPRG           MOVE SUB INTO TEST AREA                       MOS22840
146C  D021 FF90          2285           STM   R2,MOVPRG-ENDMOV8-2(R1)                                           MOS22850
1470  D120 1506          2286           LM    R2,MOVPRG+28                                                      MOS22860
1474  D021 FFAC          2287           STM   R2,MOVPRG-ENDMOV8+26(R1)                                          MOS22870
1478  D120 1522          2288           LM    R2,MOVPRG+56                                                      MOS22880
147C  D021 FFC8          2289           STM   R2,MOVPRG-ENDMOV8+54(R1)                                          MOS22890
1480  D130 153E          2290           LM    R3,MOVPRG+84                                                      MOS22900
1484  D031 FFE4          2291           STM   R3,MOVPRG-ENDMOV8+82(R1)                                          MOS22910
1488  D100 17A8          2292           LM    R0,MOSSAVE+32       RESTOTE REGISTERS (0-F)                       MOS22920
148C  C840 0A20          2293           LHI   R4,MMO                                                            MOS22930
1490  4040 003E          2294           STH   R4,X'3E'            SET NEW MM POINTER                            MOS22940
                         2295  *                                                                                 MOS22950
1494  94F6               2296  T8SX     EXBR  R15,R6                                                            MOS22960
1496  981F               2297           WHR   R1,R15              DISPLAY ADDRESS UNDER TEST                    MOS22970
1498  C8F0 04A4          2298           LHI   LINK,TSTEND                                                       MOS22980
149C  40F0 0A9A          2299           STH   LINK,BRKVECT                                                      MOS22990
14A0  41F0 08BE          2300           BAL   LINK,TSTBRK         IF "BREAK" GO TO "OPTIN" ELSE RETURN          MOS23000
14A4  C840 3044          2301           LHI   R4,C'0D'                                                          MOS23010
14A8  4040 0AE6          2302           STH   R4,ERRNO            ERRNO = C'0D'                                 MOS23020
14AC  41E6 FF92          2303           BAL   R14,MOVPRG-ENDMOV8(R6) BRANCH TO "MOVPRG"                         MOS23030
                         2304  *                                                                                 MOS23040
14B0  D000 17A8          2305           STM   R0,MOSSAVE+32       SAVE REGISTERS (0-F)                          MOS23050
14B4  0816               2306           LDAR  R1,R6                                                             MOS23060
14B6  D121 FFE2          2307           LM    R2,-30(R1)          RELOCATE SUB IN MEMORY                        MOS23070
14BA  D021 FFE4          2308           STM   R2,-28(R1)                                                        MOS23080
14BE  D121 FFC6          2309           LM    R2,-58(R1)                                                        MOS23090
14C2  D021 FFC8          2310           STM   R2,-56(R1)                                                        MOS23100
14C6  D121 FFAA          2311           LM    R2,-86(R1)                                                        MOS23110
14CA  D021 FFAC          2312           STM   R2,-84(R1)                                                        MOS23120
14CE  D131 FF90          2313           LM    R3,-112(R1)                                                       MOS23130
14D2  D031 FF92          2314           STM   R3,-110(R1)                                                       MOS23140
14D6  D100 17A8          2315           LM    R0,MOSSAVE+32       RESTORE REGISTERS (0-F)                       MOS23150
                         2316  *                                                                                 MOS23160
14DA  4056 FF90          2317           STH   R5,MOVPRG-ENDMOV8-2(R6) RESTORE LAST LOC W/BG PATRN               MOS23170
14DE  088B               2318           LDAR  R8,R11                                                            MOS23180
14E0  0568               2319           CLAR  R6,R8               DONE ?                                        MOS23190
14E2  4280 1494          2320           BL    T8SX                NO, BRANCH                                    MOS23200
14E6  4300 04A4          2321           B     TSTEND              YES, END OF TEST(RETURN TO EXEC)              MOS23210
                         2322  *                                                                                 MOS23220
                         2323  ************************************************************************        MOS23230
                         2324  *                                                                                 MOS23240
14EA  2430               2325  MOVPRG   LIS   R3,0                INITIALIZE DATA PATTERN                       MOS23250
14EC  9D14               2326           SSR   R1,R4               EXERCISE BIT #3 IN INSTR. STREAM              MOS23260
                         2327  *                                                                                 MOS23270
14EE  4036 0000          2328  MOVPRG1  STH   R3,0(R6)            STORE PATTERN AT TEST LOC                     MOS23280
14F2  4846 0000          2329           LH    R4,0(R6)            LOAD FROM LOC                                 MOS23290
14F6  0543               2330           CLAR  R4,R3               EQUAL ?                                       MOS23300
14F8  2134               2331           BNES  MOVPRG24                                                          MOS23310
14FA  2731               2332  MOVPRG2  SIS   R3,1                DECREMENT DATA PATTERN                        MOS23320
14FC  2037               2333           BNZS  MOVPRG1             REPEATE TILL DONE                             MOS23330
14FE  2304               2334           BS    MOVPRG26                                                          MOS23340
```

TEST 8

```
                         2335  *                                                                      MOS23350
1500   41F0 1578         2336  MOVPRG24 BAL   LINK,ERROR          PRINT ERROR TTOD                   MOS23360
1504   2205              2337           BS    MOVPRG2                                                 MOS23370
                         2338  *                                                                      MOS23380
1506   0886              2339  MOVPRG26 LDAR  R8,R6                                                  MOS23390
1508   08C6              2340           LDAR  R12,R6             SAVE TEST LOCATION COUNTER         MOS23400
150A   CB80 0070         2341           SHI   R8,ENDMOV8-MOVPRG+2                                     MOS23410
150E   0835              2342           LDAR  R3,R5              GET BACKGROUND DATA PATTERN        MOS23420
1510   6110 0AE6         2343           AHM   R1,ERRNO           ERRNO = C'0E'                      MOS23430
1514   086A              2344           LDAR  R6,R10                                                  MOS23440
1516   0568              2345           CLAR  R6,R8              TST BG LOC = TEST LOCATION ?       MOS23450
1518   238B              2346           BNLS  MOVPRG5            YES, BRANCH                        MOS23460
151A   4846 0000         2347  MOVPRG3  LH    R4,0(R6)                                               MOS23470
151E   0543              2348           CLAR  R4,R3              IS LOW BACKGROUND PATTERN OK ?     MOS23480
1520   2134              2349           BNES  MOVPRG45           NO, BRANCH                         MOS23490
1522   C16C FFC0         2350  MOVPRG4  BXLE  R6,MOVPRG3-ENDMOV8-2(R12) CONTINUE UNTIL DONE LOW BG TST MOS23500
1526   2304              2351           BS    MOVPRG5                                                 MOS23510
                         2352  *                                                                      MOS23520
1528   41F0 1578         2353  MOVPRG45 BAL   LINK,ERROR          PRINT ERROR TTOE                   MOS23530
152C   2205              2354           BS    MOVPRG4            RETURN                             MOS23540
                         2355  *                                                                      MOS23550
152E   C86C 0002         2356  MOVPRG5  LHI   R6,2(R12)          INCREMENT LOC COUNTER              MOS23560
1532   233E              2357           BZS   MOVPRG8                                                 MOS23570
1534   088B              2358           LDAR  R8,R11                                                  MOS23580
1536   0568              2359  MOVPRG6  CLAR  R6,R8              LOC > HILIM ?                      MOS23590
1538   238B              2360           BNLS  MOVPRG8            YES, DONE                          MOS23600
153A   4846 0000         2361           LH    R4,0(R6)                                               MOS23610
153E   0543              2362           CLAR  R4,R3              NO, IS HI BACKGROUND PATTERN OK ?  MOS23620
1540   2134              2363           BNES  MOVPRG75                                                MOS23630
1542   2662              2364  MOVPRG7  AIS   R6,2               INCREMENT HI LOC                   MOS23640
1544   2037              2365           BNZS  MOVPRG6            CONTINUE (BRANCH)                  MOS23650
1546   2304              2366           BS    MOVPRG8                                                 MOS23660
                         2367  *                                                                      MOS23670
1548   41F0 1578         2368  MOVPRG75 BAL   LINK,ERROR          PRINT ERROR TTOE                   MOS23680
154C   2205              2369           BS    MOVPRG7                                                 MOS23690
                         2370  *                                                                      MOS23700
154E   C86C 0002         2371  MOVPRG8  LHI   R6,2(R12)          INDEX THE TEST LOCATION BY TWO     MOS23710
1552   023E              2372           BNZR  R14                                                     MOS23720
1554   4300 04A4         2373           B     TSTEND             (RETURN TO EXEC)                   MOS23730
       0000 1558         2374  ENDMOV8  EQU   *                  (R6)                               MOS23740
                         2375  *                                                                      MOS23750
                         2376  ************************************************************************MOS23760
                         2377  *                                                                      MOS23770
1558   C850 175C         2378  T8LOPRT  LHI   R5,T8LOMSG         UNCONDITIONALLY PRINT ERROR MESSAGE MOS23780
155C   4050 0A9C         2379           STH   R5,ISITERR                                              MOS23790
1560   41F0 0752         2380           BAL   LINK,PRINT          "HILIM - LOLIM IS < REQUIRED"      MOS23800
1564   4300 01BE         2381           B     OPTIN               ABORT TESTING SEQUENCE             MOS23810
                         2382  *                                                                      MOS23820
                         2383  ************************************************************************MOS23830
                         2384  *        END   TEST 8                                                  MOS23840
```

COMMON ERROR ROUTINE

```
1568  4040 010C          2386  PARERR   STH   R4,TEMP          SET UP TO PRINT PARITY ERROR     ***  MOS23860
156C  C840 3132          2387           LHI   R4,C'12'         *                                ***  MOS23870
1570  4040 0AE6          2388           STH   R4,ERRNO         ERRNO = C'12'                    ***  MOS23880
1574  4840 010C          2389           LH    R4,TEMP          *                                ***  MOS23890
                         2390  *                                                                    MOS23900
                         2391  *  COMMON ERROR ROUTINE         CALL:  BAL   LINK,ERROR               MOS23910
                         2392  *                                                                    MOS23920
                         2393  *   R6= LOCATION OF ERROR    R3= DATA EXPECTED     R4= DATA READ    MOS23930
                         2394  *                                                                    MOS23940
1578  D000 1788          2395  ERROR    STM   R0,MOSSAVE        SAVE CALLING REGISTERS               MOS23950
157C  41F0 05FE          2396           BAL   LINK,ERR         PRINT THE ERROR NUMBER               MOS23960
1580  25F1               2397           LCS   LINK,1                                                 MOS23970
1582  40F0 0A9E          2398           STH   LINK,NOERR       SET ERROR FLAG FOR EXEC.             MOS23980
1586  48F0 0B60          2399           LH    LINK,SCOPE+6                                           MOS23990
158A  27F1               2400           SIS   LINK,1           IS SCOPE = 1 ?                       MOS24000
158C  4330 15FC          2401           BZ    PARTNO           YES, PRINT PART NUMBER.              MOS24010
1590  27F3               2402           SIS   LINK,3           IS SCOPE = 4 ?                       MOS24020
1592  4330 15E8          2403           BZ    ERORTN2          YES, RETURN                          MOS24030
1596  27F1               2404           SIS   LINK,1           IS SCOPE = 5 ?                       MOS24040
1598  4330 15FC          2405           BZ    PARTNO           YES, PRINT PART NO. & CONTINUE       MOS24050
159C  2404               2406  ERROR1   LIS   R0,4                                                  MOS24060
159E  0816               2407           LDAR  R1,R6                                                  MOS24070
15A0  C820 16EC          2408           LDAI  R2,ADRMSG                                              MOS24080
15A4  41F0 06F2          2409           BAL   LINK,HEXASC      STORE LOCATION UNDER TEST            MOS24090
15A8  0813               2410           LDAR  R1,R3                                                  MOS24100
15AA  C820 16FA          2411           LDAI  R2,DTAEXP                                              MOS24110
15AE  41F0 06F2          2412           BAL   LINK,HEXASC      STORE DATA EXPECTED                  MOS24120
15B2  0814               2413           LDAR  R1,R4                                                  MOS24130
15B4  C820 170A          2414           LDAI  R2,DTARED                                              MOS24140
15B8  41F0 06F2          2415           BAL   LINK,HEXASC      STORE DATA READ                      MOS24150
15BC  C850 16E8          2416  ERROR2   LDAI  R5,ERRORMSG                                           MOS24160
15C0  4050 0A9C          2417           STH   R5,ISITERR       SET ISITERR                          MOS24170
15C4  41F0 0752          2418           BAL   LINK,PRINT       PRINT THE ERROR DATA                 MOS24180
15C8  2450               2419           LIS   R5,0                                                   MOS24190
15CA  4050 0A9C          2420           STH   R5,ISITERR       RESET ISITERR                        MOS24200
                         2421  *                                                                    MOS24210
15CE  48F0 0B60          2422  ERORTN   LH    LINK,SCOPE+6                                           MOS24220
15D2  4330 04A4          2423           BZ    TSTEND           IF SCOPE = 0                         MOS24230
15D6  27F1               2424           SIS   LINK,1           OR SCOPE = 1,                        MOS24240
15D8  4330 04A4          2425           BZ    TSTEND           GO TO NEXT TEST                      MOS24250
15DC  27F2               2426           SIS   LINK,2           IS SCOPE = 3 ?                       MOS24260
15DE  4330 0526          2427           BZ    ABORT1           YES, ABORT TESTING SEQUENCE          MOS24270
15E2  D100 1788          2428  ERORTN1  LM    R0,MOSSAVE       NO, RESTORE CALLING REGISTERS AND    MOS24280
15E6  030F               2429           BR    LINK             RETURN                               MOS24290
                         2430  *                                                                    MOS24300
15E8  48F0 0AA8          2431  ERORTN2  LH    LINK,TOTERR      IF SCOPE = 4                         MOS24310
15EC  26F1               2432           AIS   LINK,1           INDEX THE ERROR COUNTER              MOS24320
15EE  40F0 0AA8          2433           STH   LINK,TOTERR                                           MOS24330
15F2  C5F0 7FFF          2434           CLAI  LINK,X'7FFF'     TOTERR = MAXIMUM ?                   MOS24340
15F6  203A               2435           BNES  ERORTN1          NO, RETURN                           MOS24350
15F8  4300 0590          2436           B     HALT9            YES, WAIT FOR PRINTOUT               MOS24360
```

COMMON ERROR ROUTINE

```
15FC  C850 2041          2438  PARTNO  LDAI  R5,C' A'                                          MOS24380
1600  C560 8000          2439          CLAI  R6,X'8000'        IS ERROR IN FIRST 32 KB ?      MOS24390
1604  2185                2440          BLS   CO1               YES, BRANCH                    MOS24400
1606  C850 2042          2441          LDAI  R5,C' B'                                         MOS24410
160A  CB60 8000          2442          SAI   R6,X'8000'        NO, SUBTRACT DOWN TO > 32KB    MOS24420
160E  D250 16E2          2443  CO1     STB   R5,CHIPNO         STORE FIRST CHIP LETTER        MOS24430
1612  C850 2030          2444          LDAI  R5,C' 0'                                         MOS24440
1616  CB60 2000          2445          SAI   R6,X'2000'        IS ERROR IN FIRST 8KB ?        MOS24450
161A  211D                2446          BMS   CO2               YES, BRANCH                    MOS24460
161C  C850 2031          2447          LDAI  R5,C' 1'                                         MOS24470
1620  CB60 2000          2448          SAI   R6,X'2000'        NO, IS ERROR IN SECOND 8KB ?   MOS24480
1624  2118                2449          BMS   CO2               YES, BRANCH                    MOS24490
1626  C850 2032          2450          LDAI  R5,C' 2'                                         MOS24500
162A  CB60 2000          2451          SAI   R6,X'2000'        NO, IS ERROR IN THIRD 8KB ?    MOS24510
162E  2113                2452          BMS   CO2               YES, BRANCH                    MOS24520
1630  C850 2033          2453          LDAI  R5,C' 3'          NO, THE ERROR IS IN THE FOURTH 8KB MOS24530
1634  D250 16E3          2454  CO2     STB   R5,CHIPNO+1       STORE 8KB ROW NUMBER           MOS24540
1638  0734                2455          XAR   R3,R4             DETERMINE BIT(S) THAT FAILED   MOS24550
163A  2410                2456          LIS   R1,0              INITIALIZE CHIP NUMBER         MOS24560
163C  C530 FFFF          2457          CLAI  R3,-1             DID ALL BITS FAIL ?            MOS24570
1640  2137                2458          BNES  CO3               NO, BRANCH                     MOS24580
1642  C840 4646          2459          LDAI  R4,C'FF'                                         MOS24590
1646  4040 16E4          2460          STH   R4,CHIPNO+2       YES, STORE 8KB ROW IDENTIFIER  MOS24600
164A  2430                2461          LIS   R3,0                                             MOS24610
164C  230C                2462          BS    CO5               CONTINUE                       MOS24620
164E  9131                2463  CO3     SLHLS R3,1              DECIPHER FAILING BIT NUMBER(S) MOS24630
1650  2185                2464          BCS   CO4               (00-09,10-16)                  MOS24640
1652  2611                2465          AIS   R1,1                                             MOS24650
1654  C510 0010          2466          CLHI  R1,16             CHIP NUMBER = 16 ?             MOS24660
1658  2085                2467          BLS   CO3               NO, BRANCH                     MOS24670
165A  2402                2468  CO4     LIS   R0,2                                            MOS24680
165C  C820 16E4          2469          LDAI  R2,CHIPNO+2       CONVERT TO DECIMAL AND         MOS24690
1660  41F0 071A          2470          BAL   LINK,DECASC       STORE IN ERROR MESSAGE         MOS24700
1664  C850 16C8          2471  CO5     LDAI  R5,CHIPMSG                                       MOS24710
1668  4050 0A9C          2472          STH   R5,ISITERR        SET ISITERR                    MOS24720
166C  41F0 0752          2473          BAL   LINK,PRINT        PRINT SUSPECTED CHIP NUMBER    MOS24730
1670  2450                2474          LIS   R5,0                                             MOS24740
1672  4050 0A9C          2475          STH   R5,ISITERR        RESET ISITERR                  MOS24750
1676  0833                2476          LDAR  R3,R3             HAVE ALL SUSPECT CHIPS BEEN PRINTED? MOS24760
1678  4230 164E          2477          BNZ   CO3               NO, BRANCH                     MOS24770
167C  D100 1788          2478          LM    R0,MOSSAVE        YES, RESTORE REGISTERS AND     MOS24780
1680  4300 159C          2479          B     ERROR1            GO PRINT ERROR DATA            MOS24790
                         2480  *                                                              MOS24800
                         2481  ************************************************************** MOS24810
                         2482  *       END   COMMON ERROR ROUTINE                             MOS24820
```

CHKSUM FILE

```
                         2484  *                                                                    MOS24840
                         2485  *        TEST MESSAGES                                               MOS24850
                         2486  *                                                                    MOS24860
1684  4153 5349 474E 4544 2487  ASMEMMSG DC    C'ASSIGNED MEMORY ',X'0D0A'                          MOS24870
168C  204D 454D 4F52 5920
1694  0D0A
1696  4C4F 4C49 4D20 3E20 2488  HILOMSG  DC    C'LOLIM > HILIM IS ILLEGAL',X'0D0A'                  MOS24880
169E  4849 4C49 4D20 4953
16A6  2049 4C4C 4547 414C
16AE  0D0A
16B0  4D45 4D4F 5259 2046 2489  AVMEMMSG DC    C'MEMORY FOUND BY SEARCH',X'0D0A'                    MOS24890
16B8  4F55 4E44 2042 5920
16C0  5345 4152 4348
16C6  0D0A
16C8  5355 5350 4543 5445 2490  CHIPMSG  DC    C'SUSPECTED BAD CHIP NUMBER '                        MOS24900
16D0  4420 4241 4420 4348
16D8  4950 204E 554D 4245
16E0  5220
16E2  2A2A 2A2A           2491  CHIPNO   DC    C'****',X'0D0A'                                      MOS24910
16E6  0D0A
16E8  4C4F 4320           2492  ERRORMSG DC    C'LOC '                                              MOS24920
                         2493  *                                                                    MOS24930
16EC  2A2A 2A2A 2044 4154 2494  ADRMSG   DC    C'**** DATA EXP '                                    MOS24940
16F4  4120 4558 5020
16FA  2A2A 2A2A 2020 4441 2495  DTAEXP   DC    C'****  DATA READ '                                 MOS24950
1702  5441 2052 4541 4420
170A  2A2A 2A2A           2496  DTARED   DC    C'*****',X'0D0A'                                     MOS24960
170E  0D0A
1710  4D45 4D4F 5259 2055 2497  T6MSG    DC    C'MEMORY UNDER GALPAT TEST',X'0D0A'                  MOS24970
1718  4E44 4552 2047 414C
1720  5041 5420 5445 5354
1728  0D0A
172A  3030 3030 2D30 3030 2498  LOMSG    DC    C'0000-0000 ',X'0D0A'                               MOS24980
1732  3020
1734  0D0A
      0000 172F           2499  HIMSG    EQU   LOMSG+5                                              MOS24990
                         2500  *                                                                    MOS25000
1736  504F 5745 5220 444F 2501  T7MSG    DC    C'POWER DOWN PROCESSOR FOR 30 SECONDS ',X'0D0A'      MOS25010
173E  574E 2050 524F 4345
1746  5353 4F52 2046 4F52
174E  2033 3020 5345 434F
1756  4E44 5320
175A  0D0A
175C  4849 4C49 4D20 2D20 2502  T8LOMSG  DC    C'HILIM - LOLIM IS < REQUIRED ',X'0D0A'              MOS25020
1764  4C4F 4C49 4D20 4953
176C  203C 2052 4551 5549
1774  5245 4420
1778  0D0A
                         2503  *                                                                    MOS25030
                         2504  ************************************************************************MOS25040
                         2505  *        END   TEST MESSAGE FILE                                     MOS25050
      0000 1779           2506  LNZB     EQU   *-1                                                  MOS25060
```

CHKSUM FILE

```
                    2508  *                                                                      MOS25080
                    2509  *        TEST PROGRAM STORAGE AREA                                     MOS25090
                    2510  *                                                                      MOS25100
                    2511  ************************************************************************MOS25110
                    2512  *                                                                      MOS25120
177A                2513  OPTBUF   DS    6                 OPTION INPUT BUFFER                 MOS25130
1780                2514  VLOLIM   DS    2                 VIRTUAL LOW LIMIT                   MOS25140
1782                2515  VHILIM   DS    2                 VIRTUAL HIGH LIMIT                  MOS25150
                    2516  *                                                                      MOS25160
                    2517  ************************************************************************MOS25170
                    2518  *                                                                      MOS25180
1788                2519           ALIGN 8                                                       MOS25190
                    2520  *                                                                      MOS25200
1788                2521  MOSSAVE  DS    64                S16MMT REGISTER SAVE AREA           MOS25210
17C8                2522  PSWSAVE  DS    4                 PPF PSW SAVE AREA                   MOS25220
17CC                2523  RSAVE    DS    64                REGISTER SAVE AREA                  MOS25230
180C                2524  ERRSAVE  DS    32                REG STORAGE FOR ERROR ROUTINES      MOS25240
                    2525  *                                                                      MOS25250
                    2526  ************************************************************************MOS25260
                    2527  *                                                                      MOS25270
                    2528  *        END   TEST PROGRAM 06-204F01R01 PART 2 SECTION 1          ***  MOS25280
```

CHKSUM/M17 PUNCHER

```
182C  2400            2530  $CHKSUM  LIS   R0,0             PUNCH M17 TAPE WITH CHECKSUM          MOS25300
182E  9510            2531           EPSR  R1,R0            SELECT REG. SET 0 & CLEAR PSW         MOS25310
                      2532  *                                                                      MOS25320
1830  C810 0100       2533           LDAI  R1,ORIGIN1       LOAD START ADDRESS                    MOS25330
1834  2421            2534           LIS   R2,1             LOAD INCREMENT VALUE                  MOS25340
1836  C830 1779       2535           LDAI  R3,LNZB          LOAD FINAL ADDRESS                    MOS25350
183A  2440            2536           LIS   R4,0             INITIALIZE CHKSUM BYTE                MOS25360
                      2537  *                                                                      MOS25370
183C  D351 0000       2538  $GEN     LB    R5,0(R1)                                               MOS25380
1840  0745            2539           XAR   R4,R5            CALCULATE CHKSUM BYTE                 MOS25390
1842  C110 183C       2540           BXLE  R1,$GEN                                                MOS25400
1846  D240 0099       2541           STB   R4,MN+3          CHECKSUM BYTE TO BOOT LOADER          MOS25410
                      2542  *                                                                      MOS25420
184A  C810 0080       2543  $TAPE    LHI   R1,X'0080'                                             MOS25430
184E  9E21            2544           OCR   R2,R1            DISPLAY IN NORMAL MODE                MOS25440
1850  9444            2545           EXBR  R4,R4                                                  MOS25450
1852  9824            2546           WHR   R2,R4            DISPLAY CHKSUM BYTE (TO D1)           MOS25460
1854  9411            2547           EXBR  R1,R1                                                  MOS25470
1856  9501            2548           EPSR  R0,R1            HALT PROCESSOR                        MOS25480
                      2549  *                                                                      MOS25490
                      2550  ********************************************************************  MOS25500
                      2551  *                                                                      MOS25510
1858  D360 007A       2552  $PUNCH   LB    R6,X'7A'         GET BOUTDV (PUNCH) ADDRESS            MOS25520
185C  DE60 007B       2553           OC    R6,X'7B'         START TAPE PUNCH                      MOS25530
1860  9D60            2554           SSR   R6,R0                                                  MOS25540
1862  2091            2555           BTBS  8,1                                                    MOS25550
1864  41F0 18A6       2556           BAL   R15,$TAPL        PUNCH LEADER (256 CHARACTERS)         MOS25560
1868  9411            2557           EXBR  R1,R1            (R1) = X'0080'                        MOS25570
186A  C830 00CF       2558           LHI   R3,X'CF'                                               MOS25580
                      2559  *                                                                      MOS25590
186E  DA61 0000       2560  $PNCH1   WD    R6,0(R1)         PUNCH BOOT LOADER                     MOS25600
1872  9D60            2561           SSR   R6,R0                                                  MOS25610
1874  2081            2562           BTBS  8,1                                                    MOS25620
1876  C110 186E       2563           BXLE  R1,$PNCH1                                              MOS25630
187A  41F0 18AC       2564           BAL   R15,$TAPL1       PUNCH ONE-FOLD GAP                    MOS25640
                      2565  *                                                                      MOS25650
187E  D340 0099       2566           LB    R4,MN+3          GET CHECKSUM BYTE                     MOS25660
1882  C810 0100       2567           LDAI  R1,ORIGIN1       (NORMALLY X'A00')                     MOS25670
1886  C830 1779       2568           LDAI  R3,LNZB                                                MOS25680
                      2569  *                                                                      MOS25690
188A  D351 0000       2570  $PNCH2   LB    R5,0(R1)         PUNCH PROGRAM                         MOS25700
188E  0745            2571           XAR   R4,R5            (ORIGIN1 TO LNZB)                     MOS25710
1890  9A65            2572           WDR   R6,R5                                                  MOS25720
1892  9401            2573           EXBR  R0,R1                                                  MOS25730
1894  9820            2574           WHR   R2,R0            DISPLAY ADDRESS PUNCHED               MOS25740
1896  9D60            2575           SSR   R6,R0                                                  MOS25750
1898  2081            2576           BTBS  8,1                                                    MOS25760
189A  C110 188A       2577           BXLE  R1,$PNCH2                                              MOS25770
189E  41F0 18A6       2578           BAL   R15,$TAPL        PUNCH TRAILER                         MOS25780
18A2  4300 184A       2579           B     $TAPE            DISPLAY CHKSUM & HALT PROCESSOR       MOS25790
```

```
                        2581  * $CHKSUM/M17 PUNCHER (CONTINUED)                                  MOS25810
                        2582  *                                                                  MOS25820
                        2583  *                                                                  MOS25830
18A6   C800 0100        2584  $TAPL     LHI   R0,256              TO PUNCH BLANK LEADER        MOS25840
18AA   2303             2585            BS    $TAPLP                                           MOS25850
                        2586  *                                                                  MOS25860
18AC   C800 0080        2587  $TAPL1    LHI   R0,128              TO PUNCH 1-FOLD GAP          MOS25870
                        2588  *                                                                  MOS25880
18B0   2701             2589  $TAPLP    SIS   R0,1                                             MOS25890
18B2   032F             2590            BNPR  R15                 RETURN                       MOS25900
18B4   2430             2591            LIS   R3,0                                             MOS25910
18B6   9A63             2592            WDR   R6,R3               PUNCH BLANK FRAME            MOS25920
18B8   9D68             2593            SSR   R6,R8                                            MOS25930
18BA   2081             2594            BTBS  8,1                                              MOS25940
18BC   2206             2595            BS    $TAPLP              CONTINUE                     MOS25950
                        2596  *                                                                  MOS25960
                        2597  ************************************************************       MOS25970
18BE                    2598            END                                                    MOS25980
```

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

START OPTIONS: T=16,CROSS,ERLST,

NO CAL ERRORS
NO CAL WARNINGS
2 PASSES

```
CHIPNO    0000 16E2    2443   2454   2460   2469   2491*
CHKCOL    0000 0F4C    1636   1639   1642   1648*
CHKCOL1   0000 0F56    1652*  1657
CHKCOL2   0000 0F60    1654   1656*
CHKCOL3   0000 0F6C    1660*  1698
CHKCOL4   0000 0F8E    1669   1671*
CHKCOL5   0000 0F9A    1673   1675*
CHKCOL6   0000 0FB2    1680   1682*
CHKCOL7   0000 0FCE    1688   1690*
CHKCOL8   0000 0FEA    1696   1698*
CHKCOL9   0000 0FFE    1705*  1742
CHKCOLA   0000 1008    1707   1709*
CHKCOLB   0000 102C    1718   1720*
CHKCOLC   0000 1044    1725   1727*
CHKCOLD   0000 1060    1733   1735*
CHKCOLE   0000 1078    1740   1742*
CHKLOC    0000 0DBC    1411   1415   1418   1422   1425   1429   1435*
CHKLOC1   0000 0DC6    1439*  1444
CHKLOC10  0000 0E7C    1496   1498*
CHKLOC2   0000 0DD0    1441   1443*
CHKLOC3   0000 0DDC    1447*  1469
CHKLOC4   0000 0DFE    1456   1458*
CHKLOC5   0000 0E0A    1460   1462*
CHKLOC6   0000 0E22    1467   1469*
CHKLOC7   0000 0E36    1476*  1498
CHKLOC8   0000 0E40    1478   1480*
CHKLOC9   0000 0E64    1489   1491*
CKBG60    0000 12E0    2069*
CKBG61    0000 12FE    2080*  2087
CKBG62    0000 1308    2082   2084*
CKBG63    0000 1310    2087*  2091
CKBG64    0000 1316    2086   2090*
CKBG65    0000 131C    2088   2093*
CKBG66    0000 12F4    2074   2076*
CLIF2ND   0000 0A8C    1057*
CLIFADR   0000 0114     125*
CLIFRD    0000 0A80    1049*
CO1       0000 160E    2440   2443*
CO2       0000 1634    2446   2449   2452   2454*
CO3       0000 164E    2458   2463*  2467   2477
CO4       0000 165A    2464   2468*
CO5       0000 1664    2462   2471*
COMM      0000 09E6     980*   997
COMM1     0000 09EE     982*  1028
COMRET    0000 0AB2     596    603   1083*
CON2ND    0000 0A88     164    173    174   1054*  1055
CONADR    0000 0A7A     170    848    870    940   1044*
CONENRD   0000 0A89    1055*
CONRD     0000 0A7C     171    172    184    845    941   1046*  1047
CONRQ2S   0000 0A94     158    176    177    946   1062*
CONTIN    0000 0B42     498    898   1118*
CONWRT    0000 0A7D     955   1047*
COUNT     0000 0AAC     455    470    472   1079*
CRLF      0000 07DA     191    199    274    316    342    394    411    551    783*   857
CRT2ND    0000 0A8A    1056*
```

R13	0000 000D	67*	1410	1417	1424	1440	1455	1477	1552	1567	1578	1592	1635	1638
		1641	1653	1668	1706	1829	1882	1964	1971	1978	1994	2000	2016	2030
		2055	2081	2146	2151	2214								
R14	0000 000E	68*	263	273	309	355	358	360	383	386	655	658	664	980
		995	1014	1016	1017	1018	1139	1141	1143	1145	1150	1151	1152	1153
		1154	1231	1411	1415	1418	1422	1425	1429	1500	1636	1639	1642	1744
		1802	1810	1870	1965	1969	1972	1976	1979	1983	2099	2102	2162	2170
		2176	2177	2178	2179	2183	2184	2187	2224	2303	2372			
R15	0000 000F	70*	185	193	213	360	369	395	396	397	515	516	638	639
		640	642	646	647	681	789	900	902	981	996	1015	1019	1817
		1818	1826	1827	2013	2014	2296	2297	2556	2564	2578	2590		
R2	0000 0002	56*	76	96	102	141	143	148	153	155	157	158	162	163
		164	171	172	173	174	182	182	183	200	201	269	270	275
		276	278	279	285	288	310	318	320	322	327	344	345	433
		436	439	441	442	443	444	446	448	449	458	459	460	543
		585	589	590	596	601	602	603	604	626	629	673	674	676
		678	682	697	698	722	723	737	877	878	880	885	889	892
		892	962	983	991	992	993	994	1002	1003	1012	1013	1024	1236
		1257	1274	1280	1797	1799	1805	1807	1824	1825	1836	1868	1943	1948
		1959	2042	2062	2163	2165	2284	2285	2286	2287	2288	2289	2307	2308
		2309	2310	2311	2312	2408	2411	2414	2469	2534	2544	2546	2574	
R3	0000 0003	57*	81	82	83	149	150	153	169	170	179	179	183	184
		185	241	245	249	251	272	285	310	319	323	387	558	561
		662	665	665	690	691	692	694	699	708	709	710	712	724
		750	752	963	967	968	1333	1335	1347	1352	1354	1439	1442	1443
		1454	1457	1459	1462	1463	1466	1476	1479	1488	1491	1492	1495	1544
		1546	1559	1560	1561	1563	1571	1573	1584	1586	1588	1591	1652	1655
		1656	1667	1670	1672	1675	1676	1679	1682	1683	1687	1690	1691	1695
		1705	1708	1717	1720	1721	1724	1727	1728	1732	1735	1736	1739	1836
		1844	1859	1887	1890	1993	1996	1997	1999	2002	2003	2015	2018	2019
		2023	2025	2029	2032	2034	2036	2054	2057	2058	2080	2083	2085	2197
		2199	2202	2205	2208	2211	2214	2217	2290	2291	2313	2314	2325	2328
		2330	2332	2342	2348	2362	2410	2455	2457	2461	2463	2476	2476	2535
		2558	2568	2591	2592									
R4	0000 0004	58*	85	86	87	89	97	99	176	177	178	180	180	203
		205	214	216	217	219	221	228	230	234	261	266	276	281
		286	287	290	293	298	300	301	301	303	304	305	306	320
		325	338	340	353	356	374	388	559	640	648	650	654	656
		677	678	679	680	680	693	694	695	696	696	697	711	716
		717	719	721	721	722	746	747	748	749	760	762	766	771
		773	784	822	837	839	841	851	852	947	969	970	971	975
		1245	1246	1248	1249	1337	1338	1346	1347	1364	1406	1407	1447	1448
		1458	1459	1465	1466	1480	1481	1487	1488	1494	1495	1542	1543	1549
		1550	1562	1563	1587	1588	1660	1661	1671	1672	1678	1679	1684	1685
		1686	1687	1692	1693	1694	1695	1709	1710	1716	1717	1723	1724	1729
		1730	1731	1732	1738	1739	1834	1835	1843	1844	1858	1859	1892	1893
		1894	2020	2021	2022	2023	2033	2034	2077	2078	2084	2085	2179	2185
		2186	2188	2189	2198	2199	2204	2205	2210	2211	2216	2217	2293	2294
		2301	2302	2326	2329	2330	2347	2348	2361	2362	2386	2387	2388	2389
		2413	2455	2459	2460	2536	2539	2541	2545	2545	2546	2566	2571	
R5	0000 0005	59*	87	89	90	90	92	93	94	97	99	105	192	243
		245	283	284	296	296	308	308	311	327	380	384	451	479
		512	513	552	553	556	564	617	631	677	712	713	715	760
		764	859	1158	1159	1263	1289	1292	1791	1801	1804	1809	1840	1954
		1956	2004	2011	2026	2052	2070	2098	2100	2153	2154	2157	2158	2160

```
SINK      0000 0A74   849   918   926   942  1037*
ST        0000 0122   141*
START     0000 0132   141   147*
START2    0000 011E   109   140*
STLOOP    0000 114E  1824  1825  1826  1827  1829  1839  1868  1874*  1881
STORE10   0000 0D4C  1354*  1355
STORE11   0000 0D12  1335*  1336
STORE30   0000 0EE8  1573*  1574
STORE31   0000 0E98  1546*  1547
T3S1      0000 0EAC  1552*  1569
T3S2      0000 0EC4  1559*  1568
T3S3      0000 0ED8  1564   1566*
T3S4      0000 0EF8  1578*  1594
T3S5      0000 0F10  1586*  1593
T3S6      0000 0F20  1589   1591*
T5S1      0000 1098  1799*  1800
T5S2      0000 10AA  1807*  1808
T6ER10    0000 12A4  2024   2046*
T6ER11    0000 12AC  2035   2049*
T6MSG     0000 1710  1954   2497*
T6S1      0000 1218  1993*  1998
T6S10     0000 1290  2036*  2050
T6S2      0000 1222  1995   1997*
T6S2.5    0000 1234  2001   2003*
T6S3      0000 123C  2006*  2101
T6S4      0000 123E  2007*  2096
T6S5      0000 1240  2008*  2064
T6S6      0000 1242  2009*  2044
T6S7      0000 125A  2017   2019*
T6S8      0000 1270  2025*  2047
T6S9      0000 1286  2031   2033*
T6SX      0000 11B8  1951   1953*
T7MM1     0000 13A2  2153   2176*
T7MM2     0000 13B0  2176   2183*
T7MSG     0000 1736  2157   2501*
T7OUTMSG  0000 1372  2157*  2172
T7S1      0000 1356  2148*  2152
T7S2      0000 1386  2163*  2171
T7S3      0000 138A  2165*  2166
T7S4      0000 13CA  2192*  2225
T7S5      0000 13D2  2195*  2220
T7S6      0000 13E4  2200   2202*
T7S7      0000 13F4  2206   2208*
T7S8      0000 1404  2212   2214*
T7S9      0000 1414  2218   2220*
T8LOMSG   0000 175C  2378   2502*
T8LOPRT   0000 1558  2270   2378*
T8SW      0000 1456  2275   2278*  2279
T8SX      0000 1494  2296*  2320
TEMP      0000 010C   118*   287   290   300   303   305  2386  2389
TEST      0000 0B2A   272    349   377   390   399   437  1114*  1115  1150  1152
TEST0     0000 0C3A  1180   1227*
TEST1     0000 0D04  1181   1329*
TEST2     0000 0D7E  1182   1405*
TEST3     0000 0E82  1183   1538*
```

PROG= MOSP22 ASSEMBLED BY CAL 03-066R05-00 (32-BIT)

```
                        CROSS                                                   MOS00010
                        TARGT 16                                                MOS00020
                        WIDTH 120                                               MOS00030
MOSP22                  PROG  S16 19-197 MOS MEMORY TEST PART 2 06-204F02M96R01A13  MOS00040
                        SQCHK                                                   MOS00050
*****************************************************************             MOS00060
*       SERIES-16 19-197 MOS MEMORY TEST PART 2 - SECTION 2 (F02)               MOS00070
*                                                                               MOS00080
*       COPYRIGHT       INTERDATA, INC.          SEPTEMBER, 1976                MOS00090
*                                                                               MOS00100
*       REVISED         PRODUCT SUPPORT          APRIL, 1978                    MOS00110
*       REVISION R01 CONTAINS 5/16 MICRO I/O BUS SUPPORT.                       MOS00120
*                                                                               MOS00130
*       THIS PROGRAM TESTS THE LOWER REGION OF A 16KB OR LARGER MOS             MOS00140
*       MEMORY IN A 5/16 OR 6/16 INTERDATA PROCESSOR WITH AN OPTIONAL           MOS00150
*       BATTERY BACK-UP POWER SUPPLY.                                           MOS00160
*                                                                               MOS00170
*       TEST 0                   MEMORY SEARCH TEST                             MOS00180
*                                                                               MOS00190
*       TEST 1                   BIT SET-RESET TEST                             MOS00200
*                                                                               MOS00210
*       TEST 2                   MARCHING PATTERN TEST                          MOS00220
*                                                                               MOS00230
*       TEST 3                   0 AND 1 WALK TEST                              MOS00240
*                                                                               MOS00250
*       TEST 4                   DOUBLE OPERATION COLUMN DISTURB TEST           MOS00260
*                                                                               MOS00270
*       TEST 5                   SHORT COUNT RELOCATABLE                        MOS00280
*                                HAMMER DISTURB TEST                            MOS00290
*                                                                               MOS00300
*       TEST 6                   DIAGONAL GALPAT TEST                           MOS00310
*                                                                               MOS00320
*       TEST 7                   MEMORY HOLD TEST                               MOS00330
*       (REQUIRES MANUAL INTERVENTION & BATTERY BACK-UP POWER SUPPLY)           MOS00340
*                                                                               MOS00350
*       TEST 8 (OPTIONAL)        LONG COUNT RELOCATABLE                         MOS00360
*                                HAMMER DISTURB TEST                            MOS00370
*                                                                               MOS00380
*       THE DEFAULT TESTS ARE 0, 1, 2, 3, 4, 5, & 6.                            MOS00390
*                                                                               MOS00400
*       TEST 0 IS EXECUTED WHENEVER "RUN" IS ENTERED.                           MOS00410
*          IF "LOLIM" OR "HILIM" = 0, TEST 0 DOES A TOP OF MEMORY               MOS00420
*       SEARCH FORCING "LOLIM" AND "HILIM" TO THE BOUNDRIES                     MOS00430
*       PRINTED ON THE LIST DEVICE.                                             MOS00440
*          IF NEITHER "LOLIM" OR "HILIM" IS 0, TEST 0 PRINTS                    MOS00450
*       THE AREA UNDER TEST (LOLIM-HILIM) ON THE LIST DEVICE.                   MOS00460
*                                                                               MOS00470
*       TEST 7 REQUIRES MANUAL INTERVENTION AND CANNOT BE LOOPED ON             MOS00480
*       WHILE THE PROCESSOR IS UNATTENDED.                                      MOS00490
*                                                                               MOS00500
*       TEST 8 IS AN OPTIONAL, LONG TERM (I.E.,OVERNIGHT) TEST.                 MOS00510
*****************************************************************             MOS00520
```

```
                0000 0000              54  R0        EQU   0                                                        MOS00540
                0000 0001              55  R1        EQU   1                                                        MOS00550
                0000 0002              56  R2        EQU   2                                                        MOS00560
                0000 0003              57  R3        EQU   3                                                        MOS00570
                0000 0004              58  R4        EQU   4                                                        MOS00580
                0000 0005              59  R5        EQU   5                                                        MOS00590
                0000 0006              60  R6        EQU   6                                                        MOS00600
                0000 0007              61  R7        EQU   7                                                        MOS00610
                0000 0008              62  R8        EQU   8                                                        MOS00620
                0000 0009              63  R9        EQU   9                                                        MOS00630
                0000 000A              64  R10       EQU   10                                                       MOS00640
                0000 000B              65  R11       EQU   11                                                       MOS00650
                0000 000C              66  R12       EQU   12                                                       MOS00660
                0000 000D              67  R13       EQU   13                                                       MOS00670
                0000 000E              68  R14       EQU   14                                                       MOS00680
                0000 000E              69  RET       EQU   14                                                       MOS00690
                0000 000F              70  R15       EQU   15                                                       MOS00700
                0000 000F              71  LINK      EQU   15                                                       MOS00710
                                       72  *                                                                        MOS00720
                                       73  *  BOOTLOADER WITH CHKSUM                                                MOS00730
                                       74  *                                                                        MOS00740
0000R                                  75            ORG   X'80'                                                    MOS00750
0080   2421                            76            LIS   R2,1                                                     MOS00760
0082   2303                            77            BS    BOOT                                                     MOS00770
0084   3760                            78            DC    Z(PSWSAVE)       CURRENT PSW SAVE POINTER(32-BIT M/C)    MOS00780
0086   3764                            79            DC    Z(RSAVE)         REGISTER SAVE POINTER(32-BIT M/C)       MOS00790
0088   C810 2000                       80  BOOT      LHI   R1,ORIGIN1      R1 = ADR( FIRST BYTE OF TEST PROG)      MOS00800
008C   C830 3710                       81            LHI   R3,LNZB+1        R3 = ADR( LAST NON-ZERO BYTE )          MOS00810
0090   4030 0022                       82            STH   R3,X'22'         REGISTER SAVE POINTER(16-BIT M/C)       MOS00820
0094   2731                            83            SIS   R3,1                                                     MOS00830
0096   C860 00FF                       84  MN        LHI   R6,X'00FF'       R6 = CHKSUM BYTE = X'MN'                MOS00840
009A   D340 0078                       85            LB    R4,X'78'         INPUT DEV ADR                           MOS00850
009E   DE40 0079                       86            OC    R4,X'79'                                                 MOS00860
00A2   9D45                            87  LEADER    SSR   R4,R5                                                    MOS00870
00A4   2091                            88            BTBS  9,1              DU,BSY                                  MOS00880
00A6   9B45                            89            RDR   R4,R5                                                    MOS00890
00A8   0855                            90            LDAR  R5,R5                                                    MOS00900
00AA   2234                            91            BZS   LEADER           IGNORE LEADER                           MOS00910
00AC   D251 0000                       92  LOAD      STB   R5,0(R1)         STORE 1ST NON-ZERO & SUBSEQUENT BYTE    MOS00920
00B0   D351 0000                       93            LB    R5,0(R1)         RELOAD DATA BYTE TO                     MOS00930
00B4   0765                            94            XAR   R6,R5            GENERATE CHKSUM                         MOS00940
00B6   9481                            95            EXBR  R8,R1                                                    MOS00950
00B8   9828                            96            WHR   R2,R8            DISPLAY MEMORY ADDRESS                  MOS00960
00BA   9D45                            97            SSR   R4,R5                                                    MOS00970
00BC   2091                            98            BTBS  9,1              DU,BSY                                  MOS00980
00BE   9B45                            99            RDR   R4,R5                                                    MOS00990
00C0   C110 00AC                      100            BXLE  R1,LOAD          LOAD TILL LAST BYTE                     MOS01000
00C4   9486                           101            EXBR  R8,R6                                                    MOS01010
00C6   9828                           102            WHR   R2,R8            FINAL CHKSUM                            MOS01020
00C8   2478                           103  LDWT      LIS   R7,8                                                     MOS01030
00CA   917C                           104            SLLS  R7,12            R7 = X'8000'                            MOS01040
00CC   9557                           105            EPSR  R5,R7            HALT PROCESSOR.                         MOS01050
00CE   2203                           106            BS    LDWT                                                     MOS01060
```

EXEC - ETPE R03-06 (16 BIT/STRIPED & MODIFIED)

```
00D0                          108           ORG   X'2000'          *                                  ***  MOS01080
2000   4300 201E              109  ORIGIN1  B     START2           START HERE FOR 16-BIT PROCESSOR          MOS01090
                              110  *                                                                       MOS01100
                              111  *-----------------------------------                                    MOS01110
                              112  *   TEST CONSTANTS               *                                     MOS01120
                              113  *                                                                       MOS01130
2004   0000                   114  FIRST    DCX   0                *                                  ***  MOS01140
2006   70F0                   115  PSW      DC    X'70F0'                                                  MOS01150
2008   30F0                   116  PSW2     DC    X'30F0'                                                  MOS01160
200A   0000                   117  IOSAVE   DCX   0                                                       MOS01170
200C   0000                   118  TEMP     DCX   0                                                       MOS01180
200E   80                     119  NORM     DB    X'80'                                                    MOS01190
200F   40                     120  INCR     DB    X'40'                                                    MOS01200
                              121  *                                                              ***       MOS01210
                              122  *                                                                       MOS01220
2010   0202                   123  IO       DC    X'0202'          I/O DEVICE(S) IDENTIFIER                MOS01230
2012   1011                   124  PASLADR  DC    X'1011'          PASLA/PALM READ/WRITE ADDRESSES         MOS01240
2014   0202                   125  CLIFADR  DC    X'0202'          CURRENT LOOP INTERFACE R/W ADDRESSES    MOS01250
2016   6262                   126  LPADR    DC    X'6262'          LINE PRINTER ADDRESS                    MOS01260
2018   1011                   127  C300ADR  DC    X'1011'          CAROUSEL 300/PASLA ADDRESSES            MOS01270
201A   C0C0                   128  MICROBUS DC    X'C0C0'          MICROBUS ADDRESS                        MOS01280
201C   0000                   129           DCX   0                PROVISION FOR SPECIAL DEVICE            MOS01290
                              130  *                                                                       MOS01300
                              131  * IO =   0101  FOR CRT ON PASLA                                         MOS01310
                              132  *        0202  FOR TELETYPE, CAROUSEL 15/30                           MOS01320
                              133  *        XX03  FOR LINE PRINTER                                       MOS01330
                              134  *        0404  FOR CAROUSEL 300                                       MOS01340
                              135  *        0505  FOR MICROBUS                                           MOS01350
                              136  *                                                                       MOS01360
                              137  *-----------------------------                                  ***  MOS01370
                              138  *                                                                       MOS01380
201E   4810 2008              139  START2   LH    R1,PSW2          *                                  ***  MOS01390
2022   C820 2032              140  ST       LHI   R2,START         *                                  ***  MOS01400
2026   4010 0034              141           STH   R1,X'34'                                                 MOS01410
202A   4020 0036              142           STH   R2,X'36'         II INT NEW PSW LOC                      MOS01420
202E   0000                   143           DCX   0                TAKE AN ILLEGAL INSTRUCTION INT         MOS01430
2030   2200                   144           BS    *                HALT IF II INTERRUPT NOT TAKEN          MOS01440
                              145  *                                                                       MOS01450
2032   D310 2010              146  START    LB    R1,IO            GET I/O IDENTIFIERS                     MOS01460
2036   D320 2011              147           LB    R2,IO+1                                                  MOS01470
203A   2436                   148           LIS   R3,6             IDENTIFIER CAN BE 1,2,3,4,5             MOS01480
203C   0513                   149           CLAR  R1,R3                                                    MOS01490
203E   2182                   150           BLS   IO.OK1           BRANCH IF KB IDENTIFIER OK              MOS01500
2040   2412                   151           LIS   R1,2             OTHERWISE FORCE IT TO BE TTY            MOS01510
2042   0523                   152  IO.OK1   CLAR  R2,R3                                                    MOS01520
2044   2182                   153           BLS   IO.OK2           SAME TEST FOR LIST DEVICE               MOS01530
2046   2422                   154           LIS   R2,2                                                     MOS01540
2048   D210 2010              155  IO.OK2   STB   R1,IO            REESTABLISH VALUES                      MOS01550
204C   D220 2011              156           STB   R2,IO+1                                                  MOS01560
2050   D362 2994              157           LB    R6,CONRQ2S(R2)                                           MOS01570
2054   4060 2978              158           STH   R6,PASFLG2       SET PASLA FLAG (LIST DEVICE)            MOS01580
2058   0866                   159           LDAR  R6,R6                                                    MOS01590
205A   2336                   160           BZS   IO.OK3           SKIP IF NOT PASLA                       MOS01600
```

```
205C  9121           161          SLHLS R2,1                                                    MOS01610
205E  D302 2011      162          LB    R0,IO+1(R2)                                             MOS01620
2062  DE02 2988      163          OC    R0,CON2ND(R2)       ISSUE 2ND COMMAND (LIST DEVICE)  *** MOS01630
                     164  *                                                                     MOS01640
2066  41F0 2878      165  IO.OK3  BAL   LINK,SETKB          ESTABLISH KEYBOARD DEVICE           MOS01650
206A  9310           166          LBR   R1,R0               (R1) = 1,2,4,5                      MOS01660
206C  9111           167          SLHLS R1,1                (R1) = 2,4,6,A                      MOS01670
206E  4831 2010      168          LH    R3,IO(R1)                                               MOS01680
2072  4030 297A      169          STH   R3,CONADR           SET UP CONSOLE DEVICE ADDRESS       MOS01690
2076  4821 297C      170          LH    R2,CONRD(R1)                                            MOS01700
207A  4020 297C      171          STH   R2,CONRD            SET UP R/W COMMANDS                 MOS01710
207E  4821 2988      172          LH    R2,CON2ND(R1)                                           MOS01720
2082  4020 2988      173          STH   R2,CON2ND           2ND CMD; ENABLE READ CMD            MOS01730
2086  9011           174          SRHLS R1,1                                                    MOS01740
2088  D341 2994      175          LB    R4,CONRQ2S(R1)                                          MOS01750
208C  D240 2994      176          STB   R4,CONRQ2S          CONSOLE REQUEST TO SEND             MOS01760
2090  4040 2976      177          STH   R4,PASFLG           SET PASLA FLAG (CONSOLE)            MOS01770
2094  9333           178          LBR   R3,R3               MASK CONSOLE DEVICE TO 8 BITS    **** MOS01780
2096  0844           179          LDAR  R4,R4                                                   MOS01790
2098  2333           180          BZS   IO.OK4              SKIP 2ND OC IF NOT PASLA            MOS01800
209A  9422           181          EXBR  R2,R2                                                   MOS01810
209C  9E32           182          OCR   R3,R2               ISSUE 2ND COMMAND (CONSOLE)         MOS01820
209E  DE30 297C      183  IO.OK4  OC    R3,CONRD            PUT CONSOLE IN READ MODE            MOS01830
20A2  9B3F           184          RDR   R3,R15              READ A DUMMY CHARACTER (SET BUSY)   MOS01840
                     185  *                                                                     MOS01850
20A4  41F0 28BA      186          BAL   LINK,LCORE          SET UP LOW CORE                     MOS01860
20A8  2400           187          LIS   R0,0                                                    MOS01870
20AA  4000 29A2      188          STH   R0,WASDU            RESET 'DEVICE UNAVAILABLE' FLAGS    MOS01880
20AE  4000 29A4      189          STH   R0,WASDU1                                               MOS01890
20B2  41F0 26DA      190          BAL   LINK,CRLF                                               MOS01900
20B6  C850 2B1E      191          LHI   R5,TITLE                                                MOS01910
20BA  41F0 2652      192          BAL   R15,PRINT           PRINT TEST PROGRAM TITLE            MOS01920
                     193  *----------------------------                                        MOS01930
                     194  *  KEYBOARD INPUT ROUTINE                                            MOS01940
                     195  *                                                                     MOS01950
20BE  C8F0 2938      196  OPTIN   LHI   LINK,MM             *                                *** MOS01960
20C2  40F0 003E      197          STH   LINK,X'3E'          RESTORE ETPE MM POINTER          *** MOS01970
20C6  41F0 26DA      198          BAL   LINK,CRLF           CR,LF TO LIST DEVICE                MOS01980
20CA  4820 2008      199  OPTIN1  LH    R2,PSW2                                                 MOS01990
20CE  9512           200          EPSR  R1,R2               NO INT. REG SET 15                  MOS02000
20D0  41F0 2878      201          BAL   LINK,SETKB          ESTABLISH CONSOLE                   MOS02010
20D4  D340 2A28      202          LB    R4,AMSG             OUTPUT AN * TO INDICATE             MOS02020
20D8  41F0 26E8      203          BAL   LINK,OUTCHR         COMMAND MODE ESTABLISHED            MOS02030
20DC  2541           204          LCS   R4,1                X'FF'                               MOS02040
20DE  41F0 26E8      205          BAL   LINK,OUTCHR                                             MOS02050
20E2  C8C0 27A4      206          LHI   R12,QUESTN          SET UP R12 FOR ERR ROUTINE          MOS02060
20E6  C800 2020      207          LHI   R0,X'2020'          BLANK OUT COMMAND BUFFER            MOS02070
20EA  4000 3710      208          STH   R0,OPTBUF           WHICH WILL CONTAIN OPTION           MOS02080
20EE  4000 3712      209          STH   R0,OPTBUF+2         NAME                                MOS02090
20F2  4000 3714      210          STH   R0,OPTBUF+4                                             MOS02100
20F6  2410           211          LIS   R1,0                CLEAR OPTBUF INDEX                  MOS02110
20F8  41F0 2776      212  RDCHR   BAL   R15,GETCHR          GET A CHAR IN R4                    MOS02120
20FC  C540 0060      213          CLHI  R4,X'60'            UPPER CASE ALPHA ?                  MOS02130
```

```
2100  2183            214           BLS   RDCHAR0          BRANCH IF NO.                          MOS02140
2102  CB40 0020       215           SHI   R4,X'20'         CONVERT TO LOWER CASE                  MOS02150
2106  C540 0023       216 RDCHAR0   CLHI  R4,X'23'         IS IT HASH MARK ?                      MOS02160
210A  4330 20BE       217           BE    OPTIN                                                   MOS02170
210E  C540 005F       218           CLHI  R4,X'5F'         LEFT ARROW, UNDERLINE OR DELETE ?      MOS02180
2112  2334            219           BES   RDCHAR1          YES, BRANCH                            MOS02190
2114  C540 0008       220           CLHI  R4,X'08'         BACK SPACE ?                           MOS02200
2118  2139            221           BNES  RDCHR1           NO, BRANCH                             MOS02210
211A  2711            222 RDCHAR1   SIS   R1,1             YES, DECREMENT INDEX                   MOS02220
211C  021C            223           BMR   R12              BUFFER UNDERFLOW; PRINT '?'            MOS02230
211E  C800 0020       224           LHI   R0,X'20'                                                 MOS02240
2122  D201 3710       225           STB   R0,OPTBUF(R1)                                            MOS02250
2126  4300 20F8       226           B     RDCHR                                                    MOS02260
212A  C540 000D       227 RDCHR1    CLHI  R4,X'0D'         IS IT CR ?                             MOS02270
212E  233C            228           BES   LOOKUP           YES, TRY MATCH                         MOS02280
2130  C540 0020       229           CLHI  R4,X'20'         IS IT A BLANK?                         MOS02290
2134  2339            230           BES   LOOKUP           YES, TRY MATCH                         MOS02300
2136  C510 0006       231           CLHI  R1,6             7 CHARACTERS INPUT ?                   MOS02310
213A  038C            232           BNLR  R12              IF YES, ERROR                          MOS02320
213C  D241 3710       233           STB   R4,OPTBUF(R1)    STORE CURRENT BYTE                     MOS02330
2140  2611            234           AIS   R1,1             BUMP BUFFER INDEX                      MOS02340
2142  4300 20F8       235           B     RDCHR            READ NEXT CHARACTER                    MOS02350
                      236 *---------------------------------                                       MOS02360
                      237 *  OPTION MATCH ROUTINE                                                  MOS02370
                      238 *                                                                        MOS02380
2146  C810 2A2A       239 LOOKUP    LHI   R1,OPT           LOAD ADDRESS OF OPTION TABLE           MOS02390
214A  2430            240 LOOK1     LIS   R3,0             CLEAR BUFFER INDEX                     MOS02400
214C  0861            241           LDAR  R6,R1            SET OPTION WORD INDEX                  MOS02410
214E  4856 0000       242 LOOK2     LH    R5,0(R6)                                                 MOS02420
2152  021C            243           BMR   R12              IF MINUS, THEN NO MATCH = ERROR        MOS02430
2154  4553 3710       244           CLH   R5,OPTBUF(R3)    COMPARE TO OPTBUF HW                   MOS02440
2158  2333            245           BES   LOOK3                                                    MOS02450
215A  261C            246           AIS   R1,12                                                    MOS02460
215C  2209            247           BS    LOOK1                                                    MOS02470
215E  2632            248 LOOK3     AIS   R3,2             TRY NEXT HW                            MOS02480
2160  2662            249           AIS   R6,2                                                     MOS02490
2162  C530 0006       250           CLHI  R3,6             3 MATCHING HW FOUND ?                  MOS02500
2166  208C            251           BLS   LOOK2                                                    MOS02510
                      252 *                                                                        MOS02520
2168  C510 2AA2       253           CLHI  R1,RUN           RUN COMMAND ?                          MOS02530
216C  4330 22E6       254           BE    RUNIT                                                    MOS02540
2170  C510 2A96       255           CLHI  R1,OPTION        OPTION CMD ?                           MOS02550
2174  4230 2286       256           BNE   LOOK4            NO, LOOK FURTHER                       MOS02560
                      257 *----------------------------                                            MOS02570
                      258 *  TO PROCESS INPUT COMMAND 'OPTION'                                     MOS02580
2178  C540 000D       259           CLHI  R4,X'0D'         CR ?                                   MOS02590
217C  233C            260           BES   OPTEXX           YES, BRANCH                            MOS02600
217E  41E0 257E       261           BAL   R14,OPTVAL       NO, GET OPTION DEV PRINTOUT NO.        MOS02610
2182  C560 0006       262           CLHI  R6,6             IS DEVICE NUMBER VALID ?               MOS02620
2186  2387            263           BNLS  OPTEXX           NO, BRANCH                             MOS02630
2188  C840 000A       264           LHI   R4,X'0A'         YES, LOAD A LF CHARACTER               MOS02640
218C  41F0 26E8       265           BAL   LINK,OUTCHR      WRITE IT TO THE CONSOLE                MOS02650
2190  D260 200B       266           STB   R6,IOSAVE+1      CHANGE THE LIST DEVICE NUMBER          MOS02660
```

```
2194  4820 2A9E      267 OPTEXX  LH    R2,OPTION+8        CHECK FOR SPECIAL ROUTINE          MOS02670
2198  0232           268         BNZR  R2                 LINK TO ROUTINE                    MOS02680
                     269 *                                                                   MOS02690
219A  C830 2A2A      270 OPTRTN  LHI   R3,TEST            RETURN HERE                        MOS02700
219E  C8E0 2224      271         LHI   R14,OPTCMD8                                           MOS02710
21A2  41F0 26DA      272         BAL   LINK,CRLF                                             MOS02720
21A6  2420           273 OPTCMD  LIS   R2,0               RESET COUNTER                      MOS02730
21A8  D342 2A2A      274 OPTCMD1 LB    R4,OPT(R2)         TO PRINT TEST                      MOS02740
21AC  41F0 26E8      275         BAL   LINK,OUTCHR                                           MOS02750
21B0  2621           276         AIS   R2,1                                                  MOS02760
21B2  C520 0006      277         CLHI  R2,6                                                  MOS02770
21B6  2087           278         BLS   OPTCMD1                                               MOS02780
21B8  C840 0020      279         LHI   R4,C' '                                               MOS02790
21BC  41F0 26E8      280         BAL   LINK,OUTCHR          OUTPUT 1 SPACE                     MOS02800
21C0  2450           281         LIS   R5,0                 TO PRINT SELECTED TEST NUMBERS     MOS02810
21C2  4050 2004      282         STH   R5,FIRST                                              MOS02820
21C6  4823 0006      283         LH    R2,6(R3)             FIRST TEST WORD                    MOS02830
21CA  2440           284 OPTCMD2 LIS   R4,0                 START WITH TEST 0                  MOS02840
21CC  4040 200C      285         STH   R4,TEMP                                               MOS02850
21D0  9121           286 OPTCMD3 SLHLS R2,1                                                  MOS02860
21D2  4380 2204      287         BNC   OPTCMD7                                               MOS02870
21D6  4040 200C      288 OPTCMD4 STH   R4,TEMP           OPTION VALUE FOUND.                 MOS02880
21DA  4800 2004      289         LH    R0,FIRST          IS IT FIRST ?                       MOS02890
21DE  2335           290         BZS   OPTCMD5                                               MOS02900
21E0  C840 002C      291         LHI   R4,C',',          NO, OUTPUT COMMA                    MOS02910
21E4  41F0 26E8      292         BAL   LINK,OUTCHR                                           MOS02920
21E8  40F0 2004      293 OPTCMD5 STH   LINK,FIRST                                            MOS02930
21EC  0855           294         LDAR  R5,R5              TEST VALUE FROM SECOND HW          MOS02940
21EE  2335           295         BZS   OPTCMD6            NO                                 MOS02950
21F0  C840 0031      296         LHI   R4,C'1'            YES,OUTPUT '1'                     MOS02960
21F4  41F0 26E8      297         BAL   LINK,OUTCHR                                           MOS02970
21F8  4840 200C      298 OPTCMD6 LH    R4,TEMP            RESTORE R4                         MOS02980
21FC  D344 29C4      299         LB    R4,HEXTAB(R4)      CONVERT                            MOS02990
2200  41F0 26E8      300         BAL   LINK,OUTCHR        OUTPUT 0-F                         MOS03000
2204  4840 200C      301 OPTCMD7 LH    R4,TEMP            RESTORE                            MOS03010
2208  2641           302         AIS   R4,1               INCREMENT TEST NUMBER              MOS03020
220A  4040 200C      303         STH   R4,TEMP                                               MOS03030
220E  C540 0010      304         CLHI  R4,16                                                 MOS03040
2212  4280 21D0      305         BL    OPTCMD3                                               MOS03050
2216  0855           306 OPTCMD71 LDAR  R5,R5              DONE ?                             MOS03060
2218  023E           307         BNZR  R14                                                   MOS03070
221A  4823 0008      308         LH    R2,8(R3)           SECOND TEST WORD                   MOS03080
221E  2451           309         LIS   R5,1               R5 = 1 FOR SECOND TEST HW          MOS03090
2220  4300 21CA      310         B     OPTCMD2                                               MOS03100
                     311 *-----------------------------------                              MOS03110
                     312 *  TO OUTPUT OTHER OPTION NAMES & VALUES                          MOS03120
                     313 *                                                                  MOS03130
2224  41F0 26DA      314 OPTCMD8 BAL   LINK,CRLF                                            MOS03140
2228  2461           315         LIS   R6,1               SET LINE COUNTER                   MOS03150
222A  C820 2A36      316         LHI   R2,OPT+12          R2 POINTS TO THE NAME              MOS03160
222E  2436           317 OPTCMD9 LIS   R3,6                                                  MOS03170
2230  D342 0000      318 OPTCMD10 LB   R4,0(R2)                                            MOS03180
2234  41F0 26E8      319         BAL   LINK,OUTCHR        OUTPUT OPTION NAME CHAR            MOS03190
```

```
2238  2621           320          AIS   R2,1                                                  MOS03200
223A  2731           321          SIS   R3,1              6 CHARACTERS OUTPUT ?               MOS03210
223C  2026           322          BPS   OPTCMD10          NO,LOOP                             MOS03220
223E  C840 0020      323          LHI   R4,C' '                                               MOS03230
2242  41F0 26E8      324          BAL   LINK,OUTCHR       OUTPUT ONE SPACE                    MOS03240
2246  4852 0000      325          LH    R5,0(R2)          R5 = OPTION VALUE                   MOS03250
224A  2404           326          LIS   R0,4                                                  MOS03260
224C  41F0 25C8      327          BAL   LINK,R5HEX        WRITE OPTION VALUE IN HEX (4 DIGITS) MOS03270
2250  D300 2010      328          LB    R0,IO                                                 MOS03280
2254  2701           329          SIS   R0,1              CONSOLE = CRT ?                     MOS03290
2256  213D           330          BNZS  OPTCMD12          BRANCH: NO.                         MOS03300
2258  2661           331          AIS   R6,1              INCREMENT LINE COUNTER.             MOS03310
225A  C560 0014      332          CLHI  R6,20             PAGE FULL ?                         MOS03320
225E  2189           333          BLS   OPTCMD12          NO, BRANCH                          MOS03330
2260  2460           334          LIS   R6,0              YES, INITIALIZE LINE COUNT          MOS03340
2262  41F0 2776      335  OPTCMD11 BAL   LINK,GETCHR                                          MOS03350
2266  274D           336          SIS   R4,13             CR ?                                MOS03360
2268  4330 20BE      337          BZ    OPTIN             NO, ACCEPT NEXT COMMAND             MOS03370
226C  2643           338          AIS   R4,3              LF ?                                MOS03380
226E  2036           339          BNZS  OPTCMD11          YES, GO PRINT NEXT PAGE             MOS03390
2270  41F0 26DA      340  OPTCMD12 BAL   LINK,CRLF         NO, CRLF                            MOS03400
2274  41F0 27BE      341          BAL   LINK,TSTBRK        EXIT IF 'BREAK' PRESSED.            MOS03410
2278  2626           342          AIS   R2,6                                                  MOS03420
227A  C520 2A96      343          CLHI  R2,OPTEND2        ALL PRINTING OPTIONS DONE ?         MOS03430
227E  4280 222E      344          BL    OPTCMD9           NO,LOOP FOR NEXT ONE                MOS03440
2282  4300 20CA      345          B     OPTIN1            TO ACCEPT NEXT COMMAND              MOS03450
                     346  *-----------------------------                                      MOS03460
2286  C510 2A2A      347  LOOK4    CLHI  R1,TEST           'TEST' OPTION ?                     MOS03470
228A  4330 22B2      348          BE    TESTOP                                                MOS03480
                     349  *  TO PROCESS COMMANDS OTHER THAN 'TEST', 'OPTION'.                  MOS03490
                     350  *                                                                    MOS03500
228E  274D           351          SIS   R4,13             OPT FOLLOWED BY CR ?                MOS03510
2290  033C           352          BZR   R12               YES, ERROR                          MOS03520
2292  41E0 257E      353          BAL   R14,OPTVAL        GET OPTION VALUE IN R6              MOS03530
2296  274D           354          SIS   R4,13             TERMINATED BY CR ?                  MOS03540
2298  023C           355          BNZR  R12               IF NO, BRANCH                       MOS03550
229A  48E1 0008      356          LH    R14,8(R1)         GET OPTION CHECK ROUTINE ADDRESS    MOS03560
229E  2332           357          BZS   LOOK5                                                 MOS03570
22A0  01FE           358          BALR  R15,R14           LINK OPTION CHECK ROUTINE           MOS03580
                     359  *                               RETURN HERE                         MOS03590
22A2  4061 0006      360  LOOK5    STH   R6,6(R1)          STORE OPTION VALUE                  MOS03600
22A6  4300 20BE      361          B     OPTIN             TO ACCEPT NEXT COMMAND              MOS03610
                     362  *                                                                    MOS03620
                     363  *-----------------------------------                          ***   MOS03630
                     364  *                                                                    MOS03640
22AA  4561 000A      365  LEVELIN  CLH   R6,10(R1)         IS R6 > MAX VALUE ?           ***   MOS03650
22AE  022C           366          BPR   R12               YES, ERROR RETURN             ***   MOS03660
22B0  030F           367          BR    R15               NO, RETURN TO LOOK5           ***   MOS03670
                     368  *                                                                    MOS03680
                     369  *-----------------------------                                      MOS03690
                     370  *  TEST OPTION PROCESS ROUTINE                                       MOS03700
                     371  *                                                                    MOS03710
22B2  274D           372  TESTOP   SIS   R4,13             'TEST' FOLLOWED BY (CR) ?           MOS03720
```

EXEC - ETPE R03-06 (16 BIT/STRIPED & MODIFIED)

```
22B4  2137           373          BNZS  TSTOP1                                          MOS03730
22B6  4800 2B4E      374          LH    R0,DEFTESTS       YES, SET TEST OPTION TO       MOS03740
22BA  4000 2A30      375          STH   R0,TEST+6         FIRST TEST WORD               MOS03750
22BE  4300 20BE      376          B     OPTIN             TO ACCEPT NEXT COMMAND        MOS03760
                     377  *                                                             MOS03770
22C2  4850 2B50      378  TSTOP1  LH    R5,MAXTST                                       MOS03780
22C6  2470           379          LIS   R7,0              RESET TEST BIT ACCUMULATORS   MOS03790
22C8  2480           380          LIS   R8,0                                            MOS03800
22CA  41E0 257E      381  TSTOP2  BAL   R14,OPTVAL        GET OPTION VALUE IN R6        MOS03810
22CE  0556           382          CLAR  R5,R6                                           MOS03820
22D0  028C           383          BLR   R12               ERROR: INVALID TEST NUMBER    MOS03830
22D2  41E0 25BA      384          BAL   R14,UNARY         GET UNARY OPERAND IN R3       MOS03840
22D6  0673           385          OAR   R7,R3             SET CURRENT BIT               MOS03850
22D8  274D           386  TSTOP4  SIS   R4,13            TERMINATED BY CR ?            MOS03860
22DA  4230 22CA      387          BNZ   TSTOP2                                          MOS03870
22DE  4070 2A30      388          STH   R7,TEST+6         STORE VALID SELECTED TESTS    MOS03880
22E2  4300 20BE      389          B     OPTIN             TO ACCEPT NEXT COMMAND        MOS03890
                     390  *----------------------------                                 MOS03900
                     391  *                                                             MOS03910
22E6  41F0 26DA      392  RUNIT   BAL   LINK,CRLF                                       MOS03920
22EA  24F0           393          LIS   R15,0                                          MOS03930
22EC  40F0 29A2      394          STH   R15,WASDU         RESET DU FLAGS                MOS03940
22F0  40F0 29A4      395          STH   R15,WASDU1                                      MOS03950
22F4  240F           396          LIS   R0,15             TO FIND HIGHEST SELECTED TEST  NO.  MOS03960
22F6  4810 2A30      397          LH    R1,TEST+6         CHECK FIRST TEST HW           MOS03970
22FA  9011           398  KEEP2   SRLS  R1,1                                          MOS03980
22FC  2184           399          BCS   FOUND2            R0 = F-0 = TEST NUMBER        MOS03990
22FE  2701           400          SIS   R0,1                                          MOS04000
2300  2213           401          BNMS  KEEP2             LOOP                          MOS04010
2302  030C           402          BR    R12               TEST NOT SELECTED             MOS04020
2304  4000 29A0      403  FOUND2  STH   R0,SELTST         HIGHEST SELECTED TEST NUMBER  ***  MOS04030
                     404  *                                                             MOS04040
                     405  *  RESET TEST PARAMETERS                                      MOS04050
                     406  *                                                             MOS04060
2308  4800 2010      407          LH    R0,IO                                           MOS04070
230C  4000 200A      408          STH   R0,IOSAVE         RESTORE USER'S I/O CHOICE     MOS04080
2310  41F0 26DA      409          BAL   LINK,CRLF                                       MOS04090
2314  41F0 2AB0      410          BAL   LINK,INIT         LINK USER INITIALIZATION ROUTINE  MOS04100
                     411  *                                                             MOS04110
2318  2400           412  INITRET LIS   R0,0              RETURN HERE FROM INIT         MOS04120
231A  4000 299C      413          STH   R0,ISITERR        RESET ERROR FLAG              MOS04130
231E  4000 29A6      414          STH   R0,TOTAL          RESET TOTAL                   MOS04140
2322  4000 29A8      415          STH   R0,TOTERR         RESET TOTERR                  MOS04150
2326  4000 29A2      416          STH   R0,WASDU          RESET WASDU FLAG              MOS04160
232A  C810 3030      417          LHI   R1,C'00'                                        MOS04170
232E  4010 29DA      418          STH   R1,MTESTNO        RESET THESE FLAGS TO C'00'    MOS04180
2332  4010 29E4      419          STH   R1,ETESTNO                                      MOS04190
2336  4010 29E6      420          STH   R1,ERRNO                                        MOS04200
233A  41F0 28BA      421          BAL   LINK,LCORE        SET UP LOW CORE               MOS04210
                     422  *                                                             MOS04220
                     423  *  START SELECTION FROM TEST 0                                MOS04230
                     424  *                                                             MOS04240
233E  2400           425  KEEP3   LIS   R0,0                                           MOS04250
```

```
2340  4000 29AA          426           STH   R0,BTESTNO        RESET BINARY TEST NUMBER              MOS04260
2344  4000 29AE          427           STH   R0,NEXTST         RESET NEXT TEST NUMBER                MOS04270
                         428  *                                                                     MOS04280
                         429  *  TO FIND THE NEXT SELECTED TEST.                                    MOS04290
                         430  *                                                                     MOS04300
2348  4820 29AE          431  KEEP4    LH    R2,NEXTST         GET NEXT TEST NUMBER                  MOS04310
234C  2408               432  KEEP41   LIS   R0,8                                                  MOS04320
234E  910C               433           SLHLS R0,12             R0 = X'8000'                          MOS04330
2350  CC02 0000          434           SRHL  R0,0(R2)          R0 = NEXT TEST BIT                    MOS04340
2354  4400 2A30          435  KEEP42   NH    R0,TEST+6         LOOK AT TEST HW 1              ***    MOS04350
2358  2133               436           BNZS  KEEP5                                                 MOS04360
235A  2621               437  KEEP43   AIS   R2,1                                                  MOS04370
235C  2208               438           BS    KEEP41            LOOP FOR NEXT TEST NUMBER             MOS04380
235E  4020 29AA          439  KEEP5    STH   R2,BTESTNO        CURRENT TEST NUMBER                   MOS04390
2362  0812               440           LDAR  R1,R2             R1 = TEST NUMBER IN BINARY            MOS04400
2364  2621               441           AIS   R2,1                                                  MOS04410
2366  4020 29AE          442           STH   R2,NEXTST                                             MOS04420
236A  2402               443           LIS   R0,2              SET DIGITS TO PRINT = 2               MOS04430
236C  C820 29DA          444           LHI   R2,MTESTNO        R2 = A(MTESTNO)                       MOS04440
2370  41F0 25F2          445           BAL   LINK,HEXASC       STORE TEST NO. IN ASCII @ MTESTNO     MOS04450
2374  4820 29DA          446           LH    R2,MTESTNO                                            MOS04460
2378  4020 29E4          447           STH   R2,ETESTNO        STORE TEST NO. IN ASCII @ ETESTNO     MOS04470
237C  41F0 27BE          448           BAL   LINK,TSTBRK       TEST BREAK                            MOS04480
2380  C850 29D4          449           LHI   R5,TSTMSG                                             MOS04490
2384  41F0 2652          450           BAL   LINK,PRINT        PRINT 'TEST NN'                       MOS04500
2388  2400               451           LIS   R0,0                                                  MOS04510
238A  4000 299E          452           STH   R0,NOERR          RESET ERROR FLAG                      MOS04520
238E  4000 29AC          453           STH   R0,COUNT          RESET COUNT                           MOS04530
2392  4810 2006          454  KEEP6    LH    R1,PSW            ENABLE INTERRUPTS                     MOS04540
2396  9501               455           EPSR  R0,R1                                                 MOS04550
2398  4820 29AA          456           LH    R2,BTESTNO        R2 = TEST NUMBER                      MOS04560
239C  9121               457           SLLS  R2,LADC                                               MOS04570
239E  4812 2B54          458           LDA   R1,TESTS(R2)                                          MOS04580
23A2  0301               459           BR    R1                GO TO TEST MODULE                     MOS04590
                         460  *-----------------------------                                       MOS04600
                         461  *                                                                     MOS04610
                         462  *  TEST MODULE END ROUTINE                                            MOS04620
                         463  *                                                                     MOS04630
23A4  C8F0 2938          464  TSTEND   LHI   LINK,MM           *                              ***    MOS04640
23A8  40F0 003E          465           STH   LINK,X'3E'        RESTORE ETPE MM POINTER        ***    MOS04650
23AC  4810 2008          466           LH    R1,PSW2                                               MOS04660
23B0  9501               467           EPSR  R0,R1             DISABLE INT @ PROCESSOR LEVEL         MOS04670
23B2  4800 29AC          468           LH    R0,COUNT                                              MOS04680
23B6  2601               469           AIS   R0,1              INCREMENT COUNT                       MOS04690
23B8  4000 29AC          470           STH   R0,COUNT                                              MOS04700
23BC  41F0 27BE          471           BAL   LINK,TSTBRK       IF BREAK GO TO OPTIN           ***    MOS04710
23C0  4500 2A3C          472           CLH   R0,LOOP+6         IF COUNT > LOOP,                      MOS04720
23C4  2383               473           BNLS  KEEP7             GO TO NEXT TEST MODULE                MOS04730
23C6  4300 2392          474           B     KEEP6             OTHERWISE, REPEAT SAME TEST           MOS04740
23CA  4800 299E          475  KEEP7    LH    R0,NOERR          LOOK @ ERROR FLAG                     MOS04750
23CE  2135               476           BNZS  KEEP71                                                MOS04760
23D0  C850 29FA          477           LHI   R5,NOERMSG                                            MOS04770
23D4  41F0 2652          478           BAL   LINK,PRINT        PRINT "NO ERROR"                      MOS04780
```

EXEC - ETPE R03-06 (16 BIT/STRIPED & MODIFIED)

```
23D8  4810 29AA          479  KEEP71   LH    R1,BTESTNO          GET TEST NUMBER                          MOS04790
23DC  4510 29A0          480           CLH   R1,SELTST          IS THE LAST SELECTED TEST DONE ?         MOS04800
23E0  4280 2348          481           BL    KEEP4               NO, GO SELECT NEXT TEST                  MOS04810
                         482  *                                                                          MOS04820
                         483  *  ALL THE SELECTED TESTS ARE NOW RUN                                      MOS04830
                         484  *                                                                          MOS04840
23E4  C8F0 2938          485  ABORT    LHI   LINK,MM             COME HERE TO ABORT TEST SEQUENCE ***     MOS04850
23E8  40F0 003E          486           STH   LINK,X'3E'          RESTORE ETPE MM POINTER          ***     MOS04860
23EC  4810 2008          487           LH    R1,PSW2                                                    MOS04870
23F0  9501               488           EPSR  R0,R1               PSW = 30F0                           MOS04880
23F2  41F0 24D8          489           BAL   LINK,DISPLAY        DISPLAY TOTAL & TOTERR                   MOS04890
23F6  29A6               490           DC    Z(TOTAL),Z(TOTERR)                                         MOS04900
23F8  29A8
23FA  41F0 2842          491           BAL   LINK,TSTDU          RETURN WITH R1 = DU BIT                  MOS04910
23FE  4230 2460          492           BNZ   KEEP9               IF DU, DISPLAY TOTAL                     MOS04920
2402  4810 29A4          493           LH    R1,WASDU1           WAS IT EVER ?                            MOS04930
2406  4230 2496          494           BNZ   KEEP92              YES, PRINT TOTAL, TOTERR                 MOS04940
240A  41F0 27BE          495           BAL   LINK,TSTBRK                                                  MOS04950
240E  4810 2A48          496           LH    R1,CONTIN+6         IF CONTIN = 0,                           MOS04960
2412  233E               497           BZS   ABORT3              GO TO ABORT TEST                 ***     MOS04970
2414  6110 29A6          498           AHM   R1,TOTAL            INCREMENT TOTAL COUNTER          ***     MOS04980
2418  4230 233E          499           BNZ   KEEP3               IF TOTAL < MAX, BRANCH           ***     MOS04990
241C  2511               500           LCS   R1,1                OTHERWISE                        ***     MOS05000
241E  6110 29A6          501           AHM   R1,TOTAL            SET "TOTAL" TO MAX &             ***     MOS05010
2422  4300 2490          502           B     HALT9               HALT PROCESSOR                   ***     MOS05020
                         503  *                                                                          MOS05030
2426  C8F0 2938          504  ABORT1   LHI   LINK,MM             *                                ***     MOS05040
242A  40F0 003E          505           STH   LINK,X'3E'          RESTORE ETPE MM POINTER          ***     MOS05050
                         506  *                                                                   ***     MOS05060
242E  4810 2008          507  ABORT3   LH    R1,PSW2             *                                ***     MOS05070
2432  9501               508           EPSR  R0,R1               SET PSW = X'30F0'                ***     MOS05080
2434  41F0 2878          509           BAL   LINK,SETKB          KB DEVICE = LIST DEVICE                  MOS05090
2438  C850 2A18          510           LHI   R5,EOTMSG                                                    MOS05100
243C  4050 299C          511           STH   R5,ISITERR          *                                ***     MOS05110
2440  41F0 2652          512           BAL   LINK,PRINT          'END OF TEST'                            MOS05120
2444  24F0               513           LIS   R15,0               *                                ***     MOS05130
2446  40F0 299C          514           STH   R15,ISITERR         *                                ***     MOS05140
                         515  *                                                                          MOS05150
244A  48F0 2A54          516           LH    LINK,NOMSG+6        IF "NOMSG" = 1,                          MOS05160
244E  4230 2496          517           BNZ   KEEP92              PRINT "TOTAL" & "TOTERR"                 MOS05170
2452  48F0 2A60          518           LH    LINK,SCOPE+6        *                                ***     MOS05180
2456  27F4               519           SIS   LINK,4              IF "SCOPE" = 4,                  ***     MOS05190
2458  4330 2496          520           BZ    KEEP92              PRINT "TOTAL" & "TOTERR"         ***     MOS05200
245C  4300 20BE          521           B     OPTIN                                                      MOS05210
                         522  *---------------------------------                                       MOS05220
                         523  *  ROUTINE INCREMENTS, DISPLAYS & CHECKS 'TOTAL'                          MOS05230
                         524  *                                                                          MOS05240
2460  4010 29A2          525  KEEP9    STH   R1,WASDU            SET 'WASDU' FLAG                         MOS05250
                         526  *                                                                          MOS05260
2464  4810 29A6          527  ABORT2   LH    R1,TOTAL            INCREMENT TOTAL                          MOS05270
2468  2611               528           AIS   R1,1                                                         MOS05280
246A  4010 29A6          529           STH   R1,TOTAL                                                     MOS05290
246E  41F0 24D8          530  KEEP91   BAL   LINK,DISPLAY        DISPLAY TOTAL & TOTERR                   MOS05300
```

EXEC - ETPE R03-06 (16 BIT/STRIPED & MODIFIED)

```
2472  29A6                531           DC    Z(TOTAL),Z(TOTERR)                                    MOS05310
2474  29A8
2476  4810 29A6           532           LH    R1,TOTAL                                              MOS05320
247A  C510 7FFF           533           CLHI  R1,X'7FFF'          TOTAL < MAX RETAINABLE ?          MOS05330
247E  2389                534           BNLS  HALT9               NO, BRANCH                        MOS05340
2480  4800 29AA           535           LH    R0,BTESTNO          R0 = CURRENT TEST NUMBER          MOS05350
2484  4500 29A0           536           CLH   R0,SELTST           IS IT LAST TEST ?                 MOS05360
2488  4280 2348           537           BL    KEEP4               NO, GO TO NEXT TEST               MOS05370
248C  4300 233E           538           B     KEEP3               YES, GO TO TEST 0                 MOS05380
                          539  *                                                                    MOS05390
2490  C810 80F0           540  HALT9    LHI   R1,X'80F0'          (R1) = X'80F0'              ***   MOS05400
2494  9521                541           EPSR  R2,R1               HALT PROCESSOR                    MOS05410
                          542  *                                                                    MOS05420
                          543  *  WHEN EXE/RUN IS PRESSED, PRINT TOTAL & TOTERR                     MOS05430
                          544  *                                                                    MOS05440
2496  41F0 2842           545  KEEP92   BAL   LINK,TSTDU          SEE IF LIST DEV IS ON             MOS05450
249A  2035                546           BNZS  HALT9               NO, BRANCH                        MOS05460
249C  2400                547  KEEP10   LIS   R0,0                                                  MOS05470
249E  4000 29A2           548           STH   R0,WASDU            RESET FLAG                        MOS05480
24A2  41F0 26DA           549           BAL   LINK,CRLF                                             MOS05490
24A6  C850 29EA           550           LHI   R5,TOTMSG                                             MOS05500
24AA  4050 299C           551           STH   R5,ISITERR                                            MOS05510
24AE  41F0 2652           552           BAL   LINK,PRINT          PRINT 'TOTAL   TOTERR'            MOS05520
24B2  2404                553           LIS   R0,4                TO PRINT 4 HEX DIGITS             MOS05530
24B4  4850 29A6           554           LH    R5,TOTAL                                              MOS05540
24B8  41F0 25C8           555           BAL   LINK,R5HEX          PRINT TOTAL IN HEX                MOS05550
24BC  2434                556           LIS   R3,4                                                  MOS05560
24BE  C840 0020           557           LHI   R4,C' '             SPACE                             MOS05570
24C2  41F0 26E8           558  KEEP101  BAL   LINK,OUTCHR         OUTPUT IT                         MOS05580
24C6  2731                559           SIS   R3,1                                                  MOS05590
24C8  2023                560           BPS   KEEP101             4 TIMES                           MOS05600
24CA  2404                561           LIS   R0,4                TO PRINT 4 HEX DIGITS             MOS05610
24CC  4850 29A8           562           LH    R5,TOTERR                                             MOS05620
24D0  41F0 25C8           563           BAL   LINK,R5HEX          PRINT TOTERR IN HEX               MOS05630
24D4  4300 20BE           564           B     OPTIN               GO TO BEGINNING                   MOS05640
                          565  *-----------------------------------                                 MOS05650
                          566  *   DISPLAY DATA ROUTINE                                             MOS05660
24D8  2401                567  DISPLAY  LIS   R0,1                GET DISPLAY PANEL ADDRESS         MOS05670
24DA  DE00 200F           568           OC    R0,INCR             PUT PANEL IN INCREMENTAL MODE     MOS05680
24DE  481F 0002           569           LH    R1,2(LINK)          GET 2ND PARAMETER                 MOS05690
24E2  4811 0000           570           LH    R1,0(R1)            GET DATA                          MOS05700
24E6  9411                571           EXBR  R1,R1                                                 MOS05710
24E8  9801                572           WHR   R0,R1               WRITE DATA                        MOS05720
24EA  481F 0000           573           LH    R1,0(LINK)          GET 1ST PARAMETER                 MOS05730
24EE  4811 0000           574           LH    R1,0(R1)            GET DATA                          MOS05740
24F2  9411                575           EXBR  R1,R1                                                 MOS05750
24F4  9801                576           WHR   R0,R1               WRITE DATA                        MOS05760
24F6  DE00 200E           577           OC    R0,NORM             PUT PANEL IN NORMAL MODE          MOS05770
24FA  430F 0004           578           B     4(LINK)             RETURN                            MOS05780
                          579  *-----------------------------------                             ***  MOS05790
                          580  *  ERROR ROUTINES                   (OVERRIDE NOMSG OPTION)           MOS05800
                          581  *                                                                    MOS05810
24FE  D000 37A4           582  ERR      STM   R0,ERRSAVE          STORE REGISTERS                   MOS05820
```

EXEC - ETPE R03-06 (16 BIT/STRIPED & MODIFIED)

```
2502  4120 251C          583           BAL   R2,ERRCOM          RETURN IF LIST DEVICE IS ON              MOS05830
2506  41E0 2550          584           BAL   RET,ERR1           PRINT 'ERROR TTNN'                       MOS05840
250A  2400               585  ERRCOM2  LIS   R0,0               *                                  ***   MOS05850
250C  4000 299C          586           STH   R0,ISITERR         RESET ERROR FLAG                         MOS05860
2510  4820 2006          587           LH    R2,PSW                                                      MOS05870
2514  9502               588           EPSR  R0,R2                                                       MOS05880
2516  D100 37A4          589           LM    R0,ERRSAVE         RESTORE REGISTERS                        MOS05890
251A  030F               590           BR    LINK               RETURN TO TEST                           MOS05900
                         591  *                                                                          MOS05910
                         592  *  ETPE COMMON ERROR ROUTINE                                       ***   MOS05920
                         593  *                                                                          MOS05930
251C  4020 29B2          594  ERRCOM   STH   R2,COMRET                                                  MOS05940
2520  4810 2008          595           LH    R1,PSW2                                                     MOS05950
2524  9501               596           EPSR  R0,R1              DISABLE INT. @ PROCESSOR LEVEL           MOS05960
2526  41F0 2842          597           BAL   LINK,TSTDU         GET LIST DEVICE DU BIT IN R1             MOS05970
252A  2138               598           BNZS  ERRCOM1            BRANCH IF OFF-LINE                       MOS05980
252C  4020 299C          599           STH   R2,ISITERR         SET ERROR FLAG                           MOS05990
2530  4020 299E          600           STH   R2,NOERR                                                    MOS06000
2534  4820 29B2          601           LH    R2,COMRET                                                   MOS06010
2538  0302               602           BR    R2                 GO, PRINT ERROR MESSAGE                  MOS06020
                         603  *                                                                          MOS06030
253A  4810 29A8          604  ERRCOM1  LH    R1,TOTERR          LIST DEVICE IS OFF                       MOS06040
253E  2611               605           AIS   R1,1                                                        MOS06050
2540  4010 29A8          606           STH   R1,TOTERR          INCREMENT TOTERR                         MOS06060
2544  C510 7FFF          607           CLHI  R1,X'7FFF'         TOTERR < MAX RETAINABLE ?                MOS06070
2548  4280 246E          608           BL    KEEP91             NO, ABORT CURRENT TEST & GOTO NEXT       MOS06080
254C  4300 2490          609           B     HALT9              YES, HALT PROCESSOR                      MOS06090
                         610  *----------------------------                                             MOS06100
                         611  * MESSAGE PRINT ROUTINES          (DO NOT OVERRIDE NOMSG OPTION)           MOS06110
                         612  *                                                                          MOS06120
                         613  *  TO PRINT 'ERROR TTNN'                                                  MOS06130
                         614  *                                                                          MOS06140
2550  C850 29DE          615  ERR1     LHI   R5,ERRMSG                                                  MOS06150
2554  41F0 2652          616           BAL   LINK,PRINT         PRINT 'ERROR TTNN'                       MOS06160
                         617  *                                TT = TEST NO., NN = ERROR NO.            MOS06170
2558  030E               618           BR    RET                RETURN                                   MOS06180
                         619  *                                                                   ***   MOS06190
                         620  *  TO PRINT 'PSW PPPP  LOC LLLL'                                          MOS06200
                         621  *                                                                          MOS06210
255A  2404               622  ERRPL1   LIS   R0,4               SET UP DIGITS = 4                        MOS06220
255C  4810 2970          623           LH    R1,OPSW            R1 = OLD PSW                             MOS06230
2560  C820 2A08          624           LHI   R2,ASCIPSW                                                  MOS06240
2564  41F0 25F2          625           BAL   LINK,HEXASC        CONVERT IT TO ASCII                      MOS06250
2568  4810 2972          626           LH    R1,OLOC            R1= OLD LOC                              MOS06260
256C  C820 2A12          627           LHI   R2,ASCILOC                                                  MOS06270
2570  41F0 25F2          628           BAL   LINK,HEXASC        CONVERT IT TO ASCII                      MOS06280
2574  C850 2A04          629           LHI   R5,PSWMSG                                                   MOS06290
2578  41F0 2652          630           BAL   LINK,PRINT         PRINT 'PSW PPPP  LOC LLLL'               MOS06300
257C  030E               631           BR    RET                RETURN                                   MOS06310
                         632  * *********************************                                        MOS06320
                         633  *  TO OBTAIN OPTION VALUE IN R6    (16 BITS, TARGT 16)                    MOS06330
                         634  *                                                                          MOS06340
257E  2460               635  OPTVAL   LIS   R6,0               INITIALIZE ACCUMULATOR                   MOS06350
```

```
2580  41F0 2776          636           BAL   R15,GETCHR          GET A CHAR IN R4                          MOS06360
2584  24FF               637  OPTVAL0  LIS   R15,15                                                       MOS06370
2586  D44F 29C4          638  OPTVAL1  CLB   R4,HEXTAB(R15)      SCAN TABLE                                MOS06380
258A  2334               639           BES   OPTVAL2             MATCH                                     MOS06390
258C  27F1               640           SIS   R15,1                                                       MOS06400
258E  2214               641           BNMS  OPTVAL1                                                     MOS06410
2590  030C               642           BR    R12                 ERROR; VALUE NOT IN TABLE.                MOS06420
2592  9164               643  OPTVAL2  SLLS  R6,4                SHIFT LEFT 4                              MOS06430
2594  066F               644           OAR   R6,R15              OR IN CURRENT DIGIT                       MOS06440
2596  41F0 2776          645  OPTVAL3  BAL   R15,GETCHR          GET NEXT CHAR                             MOS06450
259A  C540 005F          646           CLHI  R4,X'5F'            IS IT LEFT ARROW ?                        MOS06460
259E  2334               647           BES   OPTVAL5             YES, BRANCH                               MOS06470
25A0  C540 0008          648           CLHI  R4,X'08'            BACK SPACE ?                              MOS06480
25A4  2133               649           BNES  OPTVAL4             NO, BRANCH                                MOS06490
25A6  9064               650  OPTVAL5  SRLS  R6,4                YES, THROW AWAY LAST HEX ENTRY            MOS06500
25A8  2209               651           BS    OPTVAL3                                                     MOS06510
25AA  C540 000D          652  OPTVAL4  CLHI  R4,13               EXIT IF CR                                MOS06520
25AE  033E               653           BER   R14                                                         MOS06530
25B0  C540 002C          654           CLHI  R4,X'2C'            OR COMMA                                  MOS06540
25B4  4230 2584          655           BNE   OPTVAL0             LOOP TO PROCESS                           MOS06550
25B8  030E               656           BR    R14                 RETURN                                    MOS06560
                         657  *-----------------------------------                                         MOS06570
                         658  * TO CONVERT (R6) FROM BINARY TO UNARY PATTERN, IN R3                         MOS06580
                         659  *                                                                             MOS06590
25BA  2431               660  UNARY    LIS   R3,1                INITIALIZE                                MOS06600
25BC  C560 000F          661  UNARY1   CLHI  R6,15               DONE ?                                    MOS06610
25C0  033E               662           BER   R14                 RETURN                                    MOS06620
25C2  0A33               663           AAR   R3,R3               NO. SHIFT R3.                             MOS06630
25C4  2661               664           AIS   R6,1                INCREMENT COUNTER                         MOS06640
25C6  2205               665           BS    UNARY1                                                      MOS06650
                         666  *----------------------------                                        ***    MOS06660
                         667  *  R5HEX PRINTS CONTENTS OF R5 IN HEX                                        MOS06670
                         668  *        PRINTS UPTO 4 DIGITS       (8 DIGITS, TARGT 32)                      MOS06680
                         669  *                                                                             MOS06690
25C8  D000 3764          670  R5HEX    STM   R0,RSAVE            STORE REGISTERS                           MOS06700
25CC  0820               671           LDAR  R2,R0               R2 = NO. OF DIGITS TO BE PRINTED          MOS06710
25CE  2721               672           SIS   R2,1                                                          MOS06720
25D0  4210 25EC          673           BM    R5XB                                                          MOS06730
25D4  9122               674           SLLS  R2,2                R2 = 4(DIGITS-1)                          MOS06740
25D6  0845               675  R5X      LDAR  R4,R5                                                         MOS06750
25D8  CC42 0000          676           SRAL  R4,0(R2)                                                      MOS06760
25DC  C440 000F          677           NHI   R4,15               R4 = HEX DIGIT                            MOS06770
25E0  D344 29C4          678           LB    R4,HEXTAB(R4)                                                 MOS06780
25E4  41F0 26E8          679  R5XA     BAL   R15,OUTCHR                                                    MOS06790
25E8  2724               680           SIS   R2,4                                                          MOS06800
25EA  221A               681           BNMS  R5X                 LOOP TILL ALL DIGITS                      MOS06810
25EC  D100 3764          682  R5XB     LM    R0,RSAVE            RESTORE REGISTERS                         MOS06820
25F0  030F               683           BR    LINK                RETURN                                    MOS06830
                         684  *----------------------------                                        ***    MOS06840
                         685  *  TO CONVERT HEXADECIMAL DATA IN R1 TO ASCII CHAR & STORE @ 0(R2)            MOS06850
                         686  *                                                                             MOS06860
25F2  D000 3764          687  HEXASC   STM   R0,RSAVE            STORE REGISTERS                           MOS06870
25F6  0830               688           LDAR  R3,R0               R3 = DIGITS                               MOS06880
```

```
25F8  9132            689          SLLS  R3,2                                    MOS06890
25FA  2734            690          SIS   R3,4              R3 = 4(DIGITS)-4      MOS06900
25FC  0841            691  HEXASC1 LDAR  R4,R1             R4 = HEX DATA         MOS06910
25FE  CC43 0000       692          SRAL  R4,0(R3)                                 MOS06920
2602  C440 000F       693          NHI   R4,15             R4 = HEX DIGIT TO BE CONVERTED MOS06930
2606  D344 29C4       694          LB    R4,HEXTAB(R4)                            MOS06940
260A  D242 0000       695          STB   R4,0(R2)          STORE ASCII CHAR      MOS06950
260E  2621            696          AIS   R2,1                                     MOS06960
2610  2734            697          SIS   R3,4                                     MOS06970
2612  221B            698          BNMS  HEXASC1           LOOP TILL ALL DIGITS  MOS06980
2614  D100 3764       699          LM    R0,RSAVE          RESTORE REGISTERS     MOS06990
2618  030F            700          BR    LINK              RETURN                MOS07000
                      701  *----------------------------                          MOS07010
                      702  *  TO CONVERT BINARY DATA IN R1 INTO DECIMAL DIGITS    MOS07020
                      703  *     AND STORE THEM IN ASCII @ 0(R2)                  MOS07030
                      704  *                                                      MOS07040
261A  D000 3764       705  DECASC  STM   R0,RSAVE                                 MOS07050
261E  0830            706          LDAR  R3,R0             COPY DIGIT COUNT      MOS07060
2620  9131            707          SLLS  R3,LADC           & ESTABLISH DECTAB INDEX. MOS07070
2622  2732            708          SIS   R3,ADC                                   MOS07080
2624  2440            709  $DEC1   LIS   R4,0              CLEAR MODULUS COUNTER MOS07090
2626  4853 29BA       710          LDA   R5,DECTAB(R3)     LOAD LARGEST REQ. POWER OF 10. MOS07100
252A  0515            711  $DEC2   CLAR  R1,R5             EXCEEDS TEST VALUE ?  MOS07110
262C  2188            712          BLS   $DEC3             BRANCH IF YES.        MOS07120
262E  0B15            713          SAR   R1,R5             DECREMENT TEST VALUE  MOS07130
2630  2641            714          AIS   R4,1              INCREMENT MODULUS COUNTER MOS07140
2632  C540 000A       715          CLHI  R4,10             VALID DECIMAL DIGIT ? MOS07150
2636  2086            716          BLS   $DEC2             BRANCH IF YES; ELSE   MOS07160
2638  274A            717          SIS   R4,10             FORCE VALID DIGIT,    MOS07170
263A  2208            718          BS    $DEC2             REPEAT DECREMENT.     MOS07180
263C  D344 29C4       719  $DEC3   LB    R4,HEXTAB(R4)     CONVERT MODULUS COUNT TO ASCII MOS07190
2640  D242 0000       720          STB   R4,0(R2)          AND STORE AT DESTINATION MSB. MOS07200
2644  2621            721          AIS   R2,1              INCREMENT DESTINATION POINTER MOS07210
2646  2732            722          SIS   R3,ADC            DECREMENT DECTAB POINTER MOS07220
2648  4310 2624       723          BNM   $DEC1             FALL THROUGH ON DECTAB UNDERFLOW. MOS07230
264C  D100 3764       724          LM    R0,RSAVE          RESTORE USER'S REGISTERS MOS07240
2650  030F            725          BR    LINK              RETURN.               MOS07250
                      726  *----------------------------                          MOS07260
                      727  *  TO PRINT THE ASCII MESSAGE                          MOS07270
                      728  *                                                      MOS07280
2652  D000 3764       729  PRINT   STM   R0,RSAVE          STORE REGISTERS       MOS07290
2656  41F0 2842       730          BAL   LINK,TSTDU                               MOS07300
265A  2337            731          BZS   P1                                      MOS07310
265C  4010 29A2       732          STH   R1,WASDU          SET DU FLAGS          MOS07320
2660  4010 29A4       733          STH   R1,WASDU1                                MOS07330
2664  4300 26D0       734          B     PRINT5            EXIT                  MOS07340
2668  4820 29A2       735  P1      LH    R2,WASDU                                 MOS07350
266C  4330 269A       736          BZ    P3                                       MOS07360
2670  C810 0140       737          LHI   R1,X'140'         DELAY CONSTANT        MOS07370
2674  C800 1000       738  P4      LHI   R0,X'1000'                               MOS07380
2678  2701            739  P5      SIS   R0,1                                     MOS07390
267A  2031            740          BNZS  P5                                       MOS07400
267C  2711            741          SIS   R1,1                                     MOS07410
```

EXEC - ETPE R03-06 (16 BIT/STRIPED & MODIFIED)

```
267E  2035            742          BNZS  P4              LOOP TILL TIMEOUT                MOS07420
                      743  *                             (20 SEC FOR CRT WARM-UP)         MOS07430
2680  2440            744          LIS   R4,0                                             MOS07440
2682  4040 29A2       745          STH   R4,WASDU                                         MOS07450
2686  2541            746          LCS   R4,1             CHARACTER = X'FF'               MOS07460
2688  4040 29A4       747          STH   R4,WASDU1                                        MOS07470
268C  2434            748          LIS   R3,4                                             MOS07480
268E  41F0 26E8       749  P2      BAL   LINK,OUTCHR                                      MOS07490
2692  2731            750          SIS   R3,1                                             MOS07500
2694  2023            751          BPS   P2                                              MOS07510
2696  4300 249C       752          B     KEEP10           PRINT TOTAL, TOTERR             MOS07520
269A  4800 2A54       753  P3      LH    R0,NOMSG+6                                     MOS07530
269E  2335            754          BZS   PRINT2           NO, PRINT ALL MESSAGES          MOS07540
26A0  4800 299C       755          LH    R0,ISITERR                                     MOS07550
26A4  4330 26D0       756          BZ    PRINT5           NOT AN ERROR MSG. EXIT          MOS07560
                      757  *                                                            MOS07570
26A8  D345 0000       758  PRINT2  LB    R4,0(R5)         GET A MESSAGE BYTE              MOS07580
26AC  41F0 26E8       759          BAL   LINK,OUTCHR      OUTPUT IT                       MOS07590
26B0  274D            760          SIS   R4,13            CR ?                            MOS07600
26B2  2333            761          BZS   PRINT3           MSG OVER                        MOS07610
26B4  2651            762          AIS   R5,1                                           MOS07620
26B6  2207            763          BS    PRINT2           LOOP FOR NEXT CHAR              MOS07630
26B8  244A            764  PRINT3  LIS   R4,10            LF                              MOS07640
26BA  D310 200B       765          LB    R1,IOSAVE+1      GET LIST DEV IDENTIFIER         MOS07650
26BE  2713            766          SIS   R1,3             LINE PRINTER ?                  MOS07660
26C0  2335            767          BZS   PRINT3A          BRANCH IF YES.                  MOS07670
26C2  41F0 26E8       768          BAL   LINK,OUTCHR      LF                              MOS07680
26C6  2541            769          LCS   R4,1             DEL                             MOS07690
26C8  2302            770          BS    PRINT3B                                        MOS07700
26CA  2441            771  PRINT3A LIS   R4,1             YES, OUTPUT X'01'               MOS07710
26CC  41F0 26E8       772  PRINT3B BAL   LINK,OUTCHR      TERMINAL CHARACTER              MOS07720
26D0  41F0 27BE       773  PRINT5  BAL   LINK,TSTBRK                                     MOS07730
26D4  D100 3764       774          LM    R0,RSAVE         RESTORE REGISTERS               MOS07740
26D8  030F            775          BR    LINK             RETURN                          MOS07750
                      776  *--------------------------------                            MOS07760
                      777  *  SMALL SUPPORT ROUTINES                                     MOS07770
                      778  *                                                            MOS07780
                      779  *  TO OUTPUT CR,LF TO LIST DEVICE                             MOS07790
                      780  *                                                            MOS07800
26DA  D000 3764       781  CRLF    STM   R0,RSAVE         STORE REGISTERS                 MOS07810
26DE  244D            782          LIS   R4,13                                            MOS07820
26E0  41F0 26E8       783          BAL   LINK,OUTCHR      OUTPUT CR                       MOS07830
26E4  4300 26B8       784          B     PRINT3           LINE FEED, RESTORE, RETURN      MOS07840
                      785  *----------------------------                                MOS07850
                      786  *  TO OUTPUT A CHARACTER TO THE LIST DEVICE                    MOS07860
26E8  40F0 29B4       787  OUTCHR  STH   R15,OUT.SAV      SAVE RETURN ADDRESS             MOS07870
26EC  D300 200B       788          LB    R0,IOSAVE+1                                    MOS07880
26F0  2704            789          SIS   R0,4                                           MOS07890
26F2  4230 2730       790          BNZ   OUTCHR2          BRANCH IF NOT CAROUSEL          MOS07900
26F6  4000 29B0       791          STH   R0,PAUSE                                       MOS07910
26FA  41F0 2842       792  OTC.0   BAL   LINK,TSTDU       ON LINE ?                       MOS07920
26FE  4230 276C       793          BNZ   OUTO             NO, BRANCH                      MOS07930
2702  9D01            794          SSR   R0,R1           GET CAROUSEL STATUS             MOS07940
```

```
2704  2386           795           BNCS  OTC.1            BRANCH IF CHAR. IS TO BE READ          MOS07950
2706  4810 29B0      796           LH    R1,PAUSE           PAUSED NOW ?                           MOS07960
270A  2038           797           BNZS  OTC.0              YES, LOOP                              MOS07970
270C  4300 2730      798           B     OUTCHR2            NO, GO OUTPUT CHARACTER                MOS07980
2710  9B01           799  OTC.1    RDR   R0,R1              GET CAROUSEL CHARACTER                 MOS07990
2712  C410 007F      800           NHI   R1,X'7F'                                                  MOS08000
2716  CB10 0012      801           SHI   R1,X'12'           DC2 ?                                  MOS08010
271A  2134           802           BNZS  OTC.3              NO, BRANCH                             MOS08020
271C  4010 29B0      803           STH   R1,PAUSE           SET PAUSE FLAG                         MOS08030
2720  2308           804           BS    OUTCHR2            BRANCH                                 MOS08040
2722  2712           805  OTC.3    SIS   R1,2               DC4 ?                                  MOS08050
2724  4230 26FA      806           BNZ   OTC.0              NO, GO WAIT FOR DC2                    MOS08060
2728  40F0 29B0      807           STH   LINK,PAUSE         RESET PAUSE FLAG                       MOS08070
272C  4300 26FA      808           B     OTC.0              GO WAIT FOR DC2                        MOS08080
                     809  *                                                                        MOS08090
2730  4010 29B0      810  OUTCHR2  STH   R1,PAUSE           RESET FLAG                             MOS08100
2734  41F0 2842      811           BAL   LINK,TSTDU         OFF-LINE ?                             MOS08110
2738  4230 276C      812           BNZ   OUT0               BRANCH IF OFF-LINE                     MOS08120
273C  4110 28A2      813           BAL   R1,SETUP           SET UP FOR OUTPUT                      MOS08130
2740  9D01           814  OTC.4    SSR   R0,R1              WAIT FOR NOT BUSY                      MOS08140
2742  4230 276C      815           BTC   3,OUT0             BRANCH IF OFF-LINE                     MOS08150
2746  C510 000C      816           CLHI  R1,12              PASLA OFFLINE ?                        MOS08160
274A  4330 276C      817           BE    OUT0               BRANCH: YES.                           MOS08170
274E  C310 0008      818           THI   R1,8               BUSY ?                                 MOS08180
2752  2039           819           BNZS  OTC.4              WAIT FOR NOT BUSY.                     MOS08190
2754  9A04           820           WDR   R0,R4              OUTPUT DATA BYTE                       MOS08200
2756  41F0 2842      821  OTC.5    BAL   LINK,TSTDU         DEVICE DU ?                            MOS08210
275A  2139           822           BNZS  OUT0               YES, BRANCH                            MOS08220
275C  D310 200B      823           LB    R1,IOSAVE+1                                              MOS08230
2760  9111           824           SLHLS R1,1                                                     MOS08240
2762  D301 2011      825           LB    R0,IO+1(R1)        GET CONSOLE WRITE ADDRESS              MOS08250
2766  9D01           826           SSR   R0,R1                                                    MOS08260
2768  2089           827           BTBS  8,OTC.5            WAIT FOR NOT BUSY.                     MOS08270
276A  2303           828           BS    OUT1                                                     MOS08280
276C  4010 29A2      829  OUT0     STH   R1,WASDU           SET WASDU FLAG                         MOS08290
2770  48F0 29B4      830  OUT1     LH    LINK,OUT.SAV                                             MOS08300
2774  030F           831           BR    LINK               RETURN AS SET UP ABOVE                 MOS08310
                     832  *--------------------------------                                        MOS08320
                     833  *  TO GET A CHAR FROM KEYBOARD (IN REG R4)                               MOS08330
                     834  *                                                                        MOS08340
2776  4140 2886      835  GETCHR   BAL   R4,KBREAD          PUT KB DEVICE IN READ MODE             MOS08350
277A  0890           836           LDAR  R9,R0              SAVE CONSOLE ADDRESS                   MOS08360
277C  9D04           837           SSR   R0,R4                                                    MOS08370
277E  2081           838           BTBS  8,1                IF BUSY, LOOP (POSSIBLE HANG)    ***   MOS08380
2780  9B04           839           RDR   R0,R4              READ A CHARACTER IN R4                 MOS08390
                     840  *  TO ECHO RECEIVED CHARACTERS TO CONSOLE DEVICE IN FDX MODE              MOS08400
2782  D400 201A      841  ECHO     CLB   R0,MICROBUS        IS IT MICROBUS ?                       MOS08410
2786  233B           842           BES   ECHO1              YES, BRANCH                            MOS08420
2788  D390 297C      843           LB    R9,CONRD                                                 MOS08430
278C  C590 00A9      844           CLHI  R9,X'A9'           CAROUSEL ?                             MOS08440
2790  2137           845           BNES  ECHRTN             YES, DO NOT ECHO                       MOS08450
2792  D390 297B      846           LB    R9,CONADR+1                                              MOS08460
2796  DD90 2974      847           SS    R9,SINK                                                  MOS08470
```

EXEC - ETPE R03-06 (16 BIT/STRIPED & MODIFIED)

```
279A  2082            848          BTBS  8,2                                                  MOS08480
279C  9A94            849  ECHO1   WDR   R9,R4              ECHO RECEIVED BYTE              MOS08490
279E  C440 007F       850  ECHRTN  NHI   R4,X'7F'           REMOVE PARITY BIT               MOS08500
27A2  030F            851          BR    LINK               RETURN                          MOS08510
                      852  *-----------------------------                                     MOS08520
                      853  *  TO OUTPUT '?' TO CONSOLE                                       MOS08530
                      854  *                                                                  MOS08540
27A4  41F0 26DA       855  QUESTN  BAL   LINK,CRLF                                           MOS08550
27A8  40F0 299C       856          STH   LINK,ISITERR        SET FLAG                        MOS08560
27AC  C850 2A26       857          LHI   R5,QMSG                                             MOS08570
27B0  41F0 2652       858          BAL   LINK,PRINT          PRINT '?'                       MOS08580
27B4  2400            859          LIS   R0,0                                                MOS08590
27B6  4000 299C       860          STH   R0,ISITERR                                          MOS08600
27BA  4300 20CA       861          B     OPTIN1              TO ACCEPT COMMAND INPUT         MOS08610
                      862  *-----------------------------                                     MOS08620
                      863  * IF BREAK KEY DEPRESSED, GO TO 'OPTIN' OR (BRKVECT); ELSE RETURN. MOS08630
                      864  *   BUT IF "BREAK" & CONTIN = 1, GO TO ABORT1.                     MOS08640
                      865  *                                                                  MOS08650
27BE  D000 3784       866  TSTBRK  STM   R0,RSAVE+32         STORE REGISTERS                 MOS08660
27C2  40F0 29B6       867          STH   LINK,BRK.SAV         SAVE RETURN ADDRESS             MOS08670
27C6  D300 297A       868          LB    R0,CONADR           GET KEYBOARD DEVICE ADR         MOS08680
27CA  9D01            869          SSR   R0,R1                                               MOS08690
27CC  4210 2832       870          BTC   1,TSTBRK3           IF CLI OR MICROBUS DU, BRANCH   MOS08700
27D0  C510 000C       871          CLHI  R1,X'0C'                                            MOS08710
27D4  4330 2832       872          BE    TSTBRK3             IF PASLA DU, BRANCH             MOS08720
27D8  C310 0020       873          THI   R1,X'20'            'BREAK' KEY PRESSED ?           MOS08730
27DC  4330 2832       874          BZ    TSTBRK3             NO, EXIT                        MOS08740
27E0  D320 2010       875          LB    R2,IO                                               MOS08750
27E4  C520 0005       876          CLHI  R2,5                IS IT MICROBUS ?                MOS08760
27E8  2139            877          BNES  TSTBRK4             NO, BRANCH                      MOS08770
27EA  9B02            878  TSTBRK5 RDR   R0,R2                                               MOS08780
27EC  9D01            879          SSR   R0,R1                                               MOS08790
27EE  C310 0020       880          THI   R1,X'20'                                            MOS08800
27F2  4230 27EA       881          BNZ   TSTBRK5                                             MOS08810
27F6  4300 281E       882          B     TSTBRK2                                             MOS08820
27FA  4820 2976       883  TSTBRK4 LH    R2,PASFLG           PASLA ?                         MOS08830
27FE  233C            884          BZS   TSTBRK1             BRANCH IF NO                    MOS08840
2800  C310 0008       885          THI   R1,8                ALREADY ACKNOWLEDGED ?          MOS08850
2804  4230 2832       886          BNZ   TSTBRK3             BRANCH IF YES                   MOS08860
2808  9B02            887          RDR   R0,R2                                               MOS08870
280A  9D01            888          SSR   R0,R1                                               MOS08880
280C  2281            889          BFBS  8,1                                                 MOS08890
280E  0822            890          LDAR  R2,R2               ZERO CHARACTER ?                MOS08900
2810  4230 2832       891          BNZ   TSTBRK3             BRANCH: JUST FRAMING ERROR      MOS08910
2814  2305            892          BS    TSTBRK2                                             MOS08920
2816  9D01            893  TSTBRK1 SSR   R0,R1                                               MOS08930
2818  C310 0020       894          THI   R1,X'20'                                            MOS08940
281C  2033            895          BNZS  TSTBRK1             WAIT FOR BREAK KEY RELEASE      MOS08950
281E  48F0 2A48       896  TSTBRK2 LH    LINK,CONTIN+6       IF "CONTIN" = 1,          ***   MOS08960
2822  4230 2426       897          BNZ   ABORT1              BRANCH & ABORT TESTING    ***   MOS08970
2826  48F0 299A       898          LH    R15,BRKVECT         CHECK FOR SPECIAL ROUTINE       MOS08980
282A  4330 20BE       899          BZ    OPTIN               BRK W/NO VECTOR: TO EXEC.       MOS08990
282E  40F0 29B6       900          STH   R15,BRK.SAV         SET UP FOR EXIT                 MOS09000
```

```
2832  2400            901  TSTBRK3  LIS   R0,0                                          MOS09010
2834  4000 299A       902           STH   R0,BRKVECT          DELETE VECTOR AFTER ONE SHOT. MOS09020
2838  D100 3784       903           LM    R0,RSAVE+32         RESTORE REGISTERS         MOS09030
283C  48F0 29B6       904           LH    LINK,BRK.SAV        RESTORE RETURN ADDRESS    MOS09040
2840  030F            905           BR    LINK                RETURN TO PROGRAM         MOS09050
                      906  *-----------------------------                                MOS09060
                      907  * SEE IF CURRENT LIST DEVICE IS OFF-LINE (R1, CC NON-ZERO IF OFF) MOS09070
                      908  *                                                             MOS09080
2842  2401            909  TSTDU    LIS   R0,1                                          MOS09090
2844  4810 2976       910           LH    R1,PASFLG                                     MOS09100
2848  2333            911           BZS   $TSTDU0                                       MOS09110
284A  C800 00FC       912           LHI   R0,X'FC'                                      MOS09120
284E  D310 200B       913  $TSTDU0  LB    R1,IOSAVE+1         GET LIST DEVICE IDENTIFIER MOS09130
2852  9111            914           SLHLS R1,1                (R1) = 2,4,6,8,A...       MOS09140
2854  D311 2010       915           LB    R1,IO(R1)           GET LIST DEVICE ADDRESS   MOS09150
2858  D210 2974       916           STB   R1,SINK             SAVE LIST DEVICE ADDRESS  MOS09160
285C  9D11            917           SSR   R1,R1               GRAB STATUS               MOS09170
285E  0410            918           NAR   R1,R0                                         MOS09180
2860  C310 0001       919           THI   R1,1                CLI DU ?                  MOS09190
2864  2135            920           BNZS  $TSTDU2             YES, BRANCH               MOS09200
2866  C510 000C       921           CLHI  R1,X'0C'            PASLA DU ?                MOS09210
286A  2332            922           BES   $TSTDU2             YES, BRANCH               MOS09220
286C  2511            923  $TSTDU1  LCS   R1,1                FORCE R1 FOR RETURN CC = 0 MOS09230
286E  D300 2974       924  $TSTDU2  LB    R0,SINK             RESTORE LIST DEVICE ADDRESS MOS09240
2872  C710 FFFF       925           XHI   R1,-1               SET CONDITION CODE        MOS09250
2876  030F            926           BR    LINK                RETURN                    MOS09260
                      927  * --------------------------------                           MOS09270
                      928  * TO DIRECT INPUT AND OUTPUT TO CONSOLE DEVICE               MOS09280
                      929  *                                                             MOS09290
2878  D300 2010       930  SETKB    LB    R0,IO               GET KEYBOARD DEVICE       MOS09300
287C  9410            931           EXBR  R1,R0                                         MOS09310
287E  0610            932           OAR   R1,R0                                         MOS09320
2880  4010 200A       933           STH   R1,IOSAVE           KB DEVICE = LIST DEVICE   MOS09330
2884  030F            934           BR    LINK                RETURN                    MOS09340
                      935  *-----------------------------                               MOS09350
                      936  *  TO PUT KEYBOARD DEVICE IN READ MODE                       MOS09360
                      937  *                                                             MOS09370
2886  D300 297A       938  KBREAD   LB    R0,CONADR                                     MOS09380
288A  DE00 297C       939           OC    R0,CONRD                                      MOS09390
288E  DB00 2974       940           RD    R0,SINK                                       MOS09400
2892  4890 2976       941           LH    R9,PASFLG           PASLA ?                   MOS09410
2896  4200 2896       942           NOP   *                   FOR SPECIAL KB DEVICE     MOS09420
289A  2333            943  TTYGET   BZS   KBXIT              NO, RETURN                MOS09430
289C  DE00 2994       944           OC    R0,CONRQ2S                                    MOS09440
28A0  0304            945  KBXIT    BR    R4                  RETURN                    MOS09450
                      946  *-----------------------------                          ***  MOS09460
                      947  *  LIST DEVICE SET UP ROUTINE                                MOS09470
                      948  *                                                             MOS09480
28A2  4010 29B8       949  SETUP    STH   R1,SET.RTN                                    MOS09490
28A6  D310 200B       950           LB    R1,IOSAVE+1         GET LIST DEVICE IDENTIFIER MOS09500
28AA  9111            951           SLHLS R1,1                HW INDEX                  MOS09510
28AC  D301 2011       952           LB    R0,IO+1(R1)         GET LIST DEVICE ADDRESS   MOS09520
28B0  DE01 297D       953           OC    R0,CONWRT(R1)                                 MOS09530
```

EXEC - ETPE R03-06 (16 BIT/STRIPED & MODIFIED)

```
28B4  4810 29B8        954          LH    R1,SET.RTN                                  MOS09540
28B8  0301             955          BR    R1                 RETURN                   MOS09550
                       956  *-------------------------------                      ***  MOS09560
                       957  *  LOW CORE SET UP ROUTINE                                 MOS09570
                       958  *                                                         MOS09580
28BA  2410             959  LCORE   LIS   R1,0                                        MOS09590
28BC  2422             960          LIS   R2,2                                        MOS09600
28BE  C830 004E        961          LHI   R3,X'4E'                                    MOS09610
28C2  2400             962          LIS   R0,0                                        MOS09620
28C4  4001 0000        963  ZERO1   STH   R0,0(R1)                                    MOS09630
28C8  C110 28C4        964          BXLE  R1,ZERO1           ZERO CORE FROM 0 THRU X'4F'  MOS09640
28CC  C830 2904        965          LHI   R3,II                                       MOS09650
28D0  4030 0036        966          STH   R3,X'36'           ILL INST INT NEW PSW LOC MOS09660
28D4  C840 2938        967          LHI   R4,MM                                       MOS09670
28D8  4040 003E        968          STH   R4,X'3E'           M. M. INT NEW PSW LOC    MOS09680
28DC  C840 3764        969          LHI   R4,RSAVE                                    MOS09690
                       970  *                                                         MOS09700
                       971  *  SET UP LOW CORE FOR 16 BIT MACHINE                      MOS09710
                       972  *                                                         MOS09720
28E0  4040 0022        973          STH   R4,X'22'           REG SAVE POINTER         MOS09730
28E4  030F             974          BR    LINK               RETURN                   MOS09740
                       975  *---------------------------                          ***  MOS09750
                       976  *  SPURIOUS INTERRUPT HANDLERS                            MOS09760
                       977  *                                                         MOS09770
28E6  40E0 2970        978  COMM    STH   R14,OPSW                                    MOS09780
28EA  40F0 2972        979          STH   R15,OLOC                                    MOS09790
28EE  4800 2008        980  COMM1   LH    R0,PSW2                                     MOS09800
28F2  9520             981          EPSR  R2,R0              NO INT. , REG SET 15     MOS09810
28F4  41F0 24FE        982          BAL   LINK,ERR           PRINT 'ERROR XXFN'       MOS09820
28F8  40F0 299C        983          STH   LINK,ISITERR       FORCE PRINT              MOS09830
28FC  41E0 255A        984          BAL   RET,ERRPL1         PRINT 'PSW PPPP  LOC LLLL'  MOS09840
2900  4300 20CA        985          B     OPTIN1             ENTER COMMAND MODE       MOS09850
                       986  *                                                         MOS09860
                       987  *  ILLEGAL INSTRUCTION INTERRUPT TRAP                      MOS09870
                       988  *                                                         MOS09880
2904  C820 2938        989  II      LHI   R2,MM              *                    ***  MOS09890
2908  4020 003E        990          STH   R2,X'3E'           RESTORE ETPE MM POINTER  ***  MOS09900
290C  C820 4632        991          LHI   R2,C'F2'                                    MOS09910
2910  4020 29E6        992          STH   R2,ERRNO           SET ERROR NUMBER F2      MOS09920
2914  48E0 0030        993          LH    R14,X'30'          OLD PSW                  MOS09930
2918  48F0 0032        994          LH    R15,X'32'          OLD LOC                  MOS09940
291C  4300 28E6        995  II32    B     COMM               *                    ***  MOS09950
                       996  *                                                         MOS09960
                       997  *  MACHINE MALFUNCTION INTERRUPT TRAP                      MOS09970
                       998  *                                                         MOS09980
2920  95AA             999  MM0     EPSR  R10,R10            CAPTURE MMINT PSW    ***  MOS09990
2922  C820 2938       1000          LHI   R2,MM              *                    ***  MOS10000
2926  4020 003E       1001          STH   R2,X'3E'           RESTORE ETPE MM POINTER  ***  MOS10010
292A  C4A0 000F       1002          NHI   R10,X'000F'        *                    ***  MOS10020
292E  08AA            1003          LDAR  R10,R10            IS CC = 0 ?          ***  MOS10030
2930  2137            1004          BNZS  MM1                NO, BRANCH           ***  MOS10040
2932  41F0 3532       1005          BAL   LINK,PARERR        PRINT ERROR (PARITY)     MOS10050
2936  2304            1006          BS    MM1                *                    ***  MOS10060
```

```
                         1007  *                                                          ***   MOS10070
2938   95AA              1008  MM        EPSR  R10,R10          CAPTURE MMINT PSW             MOS10080
293A   C4A0 000F         1009            NHI   R10,X'000F'      *                     ***     MOS10090
293E   C820 4633         1010  MM1       LHI   R2,C'F3'                                      MOS10100
2942   4020 29E6         1011            STH   R2,ERRNO         SET ERROR NUMBER F3           MOS10110
2946   48E0 0038         1012            LH    R14,X'38'        OLD PSW (16 BIT PROCESSOR)    MOS10120
294A   48F0 003A         1013            LH    R15,X'3A'        OLD LOC                       MOS10130
294E   C4E0 FFF0         1014  MM32      NHI   R14,X'FFF0'                                     MOS10140
2952   06EA              1015            OAR   R14,R10          R14 = COMPOSITE PSW           MOS10150
2954   40E0 2970         1016            STH   R14,OPSW                                       MOS10160
2958   40F0 2972         1017            STH   R15,OLOC                                       MOS10170
295C   C810 7FFF         1018            LHI   R1,X'7FFF'                                     MOS10180
2960   2711              1019  MM16      SIS   R1,1             TIMEOUT                       MOS10190
2962   2021              1020            BPS   MM16                                          MOS10200
2964   C800 80F0         1021            LHI   R0,X'80F0'       R0 = X'80F0'          ***     MOS10210
2968   9520              1022            EPSR  R2,R0            HALT PROCESSOR                MOS10220
                         1023  *                                                            MOS10230
                         1024  *   WHEN EXE/RUN IS DEPRESSED, ERROR MSG IS PRINTED.         MOS10240
                         1025  *                                                            MOS10250
296A   4300 28EE         1026            B     COMM1                                        MOS10260
                         1027  * ***************************                                MOS10270
                         1028  *  ETPE CONSTANTS & TABLES                                   MOS10280
                         1029  *                                                            MOS10290
2970                     1030            ALIGN 8                                            MOS10300
                         1031  *------------------------                                   MOS10310
2970   0000              1032  OPSW      DCX   0                                            MOS10320
2972   0000              1033  OLOC      DCX   0                                            MOS10330
                         1034  *------------------------                                   MOS10340
2974   00                1035  SINK      DB    0                BIT BUCKET                  MOS10350
2975   00                1036            DB    *                                            MOS10360
2976   0000              1037  PASFLG    DCX   0                SET WHEN CONSOLE ON PASLA/PALM MOS10370
2978   0000              1038  PASFLG2   DCX   0                SET WHEN LIST DEVICE ON PASLA MOS10380
                         1039  * --------------------                                     MOS10390
                         1040  *  ETPE IO COMMANDS                                        MOS10400
                         1041  *                                                            MOS10410
297A   0000              1042  CONADR    DCX   0                CONSOLE DEVICE ADDRESS      MOS10420
                         1043  *                                                            MOS10430
297C   0000              1044  CONRD     DCX   0                CONSOLE READ/WRITE COMMANDS MOS10440
       0000 297D         1045  CONWRT    EQU   CONRD+1                                      MOS10450
297E   B1A3              1046  CRTRD     DCX   B1A3             FOR CRT                     MOS10460
2980   A4D8              1047  CLIFRD    DCX   A4D8             *   CURRENT LOOP INTERFACE  MOS10470
2982   0080              1048  LPWRT     DCX   0080             *   LINE PRINTER            MOS10480
2984   A1A3              1049  CARRD     DCX   A1A3             *   CAROUSEL 300            MOS10490
2986   8202              1050  MREADC    DCX   8202             *   MICROBUS                MOS10500
                         1051  *                                                            MOS10510
2988   0000              1052  CON2ND    DCX   0                2ND COMMAND; ENABLE READ COMMAND MOS10520
       0000 2989         1053  CONENRD   EQU   CON2ND+1                                     MOS10530
298A   F871              1054  CRT2ND    DCX   F871             FOR CRT                     MOS10540
298C   0064              1055  CLIF2ND   DCX   0064             *   CURRENT LOOP INTERFACE  MOS10550
298E   0000              1056            DCX   0                *   DUMMY HW FOR LP         MOS10560
2990   F061              1057  CAR2ND    DCX   F061             *   CAROUSEL 300            MOS10570
2992   0000              1058            DCX   0                *   DUMMY HW FOR MICROBUS   MOS10580
                         1059  *                                                            MOS10590
```

```
2994   00                    1060  CONRQ2S  DB    0                 CONSOLE REQUEST TO SEND CMD          MOS10600
2995   33                    1061  CRTRQ2S  DB    X'33'             FOR CRT                              MOS10610
2996   00                    1062           DB    0                 *   DUMMY BYTE FOR CLI               MOS10620
2997   00                    1063           DB    0                 *   DUMMY BYTE FOR LP                MOS10630
2998   23                    1064  CARRQ2S  DB    X'23'             *   CAROUSEL 300                     MOS10640
2999   00                    1065           DB    0                 *   DUMMY BYTE FOR MICROBUS          MOS10650
299A                         1066           DB    *                                                      MOS10660
                             1067  * --------------------                                                MOS10670
299A   0000                  1068  BRKVECT  DC    Z(0)              BREAK KEY VECTOR                     MOS10680
299C   0000                  1069  ISITERR  DCX   0                                                       MOS10690
299E   0000                  1070  NOERR    DCX   0                                                       MOS10700
29A0   0000                  1071  SELTST   DCX   0                 HIGHEST SELECTED TEST NUMBER         MOS10710
29A2   0000                  1072  WASDU    DCX   0                 1 IF KEYBOARD DEVICE WAS OFF         MOS10720
29A4   0000                  1073  WASDU1   DCX   0                 NON-ZERO IF TOTAL,TOTERR TO PRINT    MOS10730
29A6   0000                  1074  TOTAL    DCX   0                 NO. OF TIMES THE SELECTED TESTS RUN  MOS10740
29A8   0000                  1075  TOTERR   DCX   0                 TOTAL ERRORS DETECTED WHILE DU       MOS10750
29AA   0000                  1076  BTESTNO  DCX   0                 CURRENT TEST NUMBER IN BINARY        MOS10760
29AC   0000                  1077  COUNT    DCX   0                                                       MOS10770
29AE   0000                  1078  NEXTST   DCX   0                 NEXT TEST NUMBER                     MOS10780
29B0   0000                  1079  PAUSE    DCX   0                                                       MOS10790
                             1080  *-------------------------------                              ***     MOS10800
29B2   0000                  1081  COMRET   DCX   0                                                       MOS10810
29B4   0000                  1082  OUT.SAV  DCX   0                                                       MOS10820
29B6   0000                  1083  BRK.SAV  DCX   0                                                       MOS10830
29B8   0000                  1084  SET.RTN  DCX   0                                                       MOS10840
                             1085  *                                                                     MOS10850
29BA   0001                  1086  DECTAB   DC    1,10,100,1000,10000                                    MOS10860
29BC   000A
29BE   0064
29C0   03E8
29C2   2710
29C4   3031 3233 3435 3637   1087  HEXTAB   DB    C'0123456789ABCDEF'                                    MOS10870
29CC   3839 4142 4344 4546
```

EXEC - ETPE R03-06 (16 BIT/STRIPED & MODIFIED)

```
                          1089  *--------------------------------                                  MOS10890
                          1090  *  ETPE MESSAGES                                                  MOS10900
                          1091  *                                                                 MOS10910
29D4   5445 5354 2020 2A2A  1092  TSTMSG   DC    C'TEST  **',X'0D00'                             MOS10920
29DC   0D00
       0000 29DA            1093  MTESTNO  EQU   TSTMSG+6                                        MOS10930
29DE   4552 524F 5220 2A2A  1094  ERRMSG   DC    C'ERROR ****',X'0D00'                          MOS10940
29E6   2A2A
29E8   0D00
       0000 29E4            1095  ETESTNO  EQU   ERRMSG+6          STORED BY ETPE               MOS10950
       0000 29E6            1096  ERRNO    EQU   ERRMSG+8          STORE ERRNO AS CHAR CONSTANT MOS10960
29EA   544F 5441 4C20 2020  1097  TOTMSG   DC    C'TOTAL   TOTERR',X'0D00'                      MOS10970
29F2   544F 5445 5252
29F8   0D00
29FA   4E4F 2045 5252 4F52  1098  NOERMSG  DC    C'NO ERROR',X'0D00'                            MOS10980
2A02   0D00
2A04   5053 5720 2A2A 2A2A  1099  PSWMSG   DC    C'PSW ****  LOC ****',X'0D00'                 MOS10990
2A0C   2020 4C4F 4320 2A2A
2A14   2A2A
2A16   0D00
       0000 2A08            1100  ASCIPSW  EQU   PSWMSG+4                                      MOS11000
       0000 2A0E            1101  LOCMSG   EQU   PSWMSG+10                                     MOS11010
       0000 2A12            1102  ASCILOC  EQU   PSWMSG+14                                     MOS11020
2A18   454E 4420 4F46 2054  1103  EOTMSG   DC    C'END OF TEST',X'0D00'                         MOS11030
2A20   4553 5420
2A24   0D00
2A26   3F0D                 1104  QMSG     DC    X'3F0D'                                        MOS11040
2A28   2A0D                 1105  AMSG     DC    X'2A0D'                                        MOS11050
```

```
                         1108  ************************************************************************   MOS11080
                         1109  *                                                                        MOS11090
                         1110  *  OPTION/COMMAND TABLE                                                  MOS11100
                         1111  *                                                                        MOS11110
2A2A  5445 5354 2020     1112  TEST     DC    C'TEST  ',X'FE00',X'0',X'0' *          0 TO 8          MOS11120
2A30  FE00
2A32  0000
2A34  0000
      0000 2A2A          1113  OPT      EQU   TEST                                                     MOS11130
                         1114  *                                                                        MOS11140
2A36  4C4F 4F50 2020     1115  LOOP     DC    C'LOOP  ',X'0',Z(LEVELIN),X'7FFF' *     MAX=X'7FFF'     MOS11150
2A3C  0000
2A3E  22AA
2A40  7FFF
2A42  434F 4E54 494E     1116  CONTIN   DC    C'CONTIN',X'0',Z(LEVELIN),X'1' *       0 OR 1          MOS11160
2A48  0000
2A4A  22AA
2A4C  0001
2A4E  4E4F 4D53 4720     1117  NOMSG    DC    C'NOMSG ',X'0',Z(LEVELIN),X'1' *       0 OR 1          MOS11170
2A54  0000
2A56  22AA
2A58  0001
2A5A  5343 4F50 4520     1118  SCOPE    DC    C'SCOPE ',X'0',Z(LEVELIN),X'5' *       MAX = 5         MOS11180
2A60  0000
2A62  22AA
2A64  0005
2A66  4441 5441 2020     1119  DATA     DC    C'DATA  ',X'FFFF',X'0',X'0' *          0 TO FFFF       MOS11190
2A6C  FFFF
2A6E  0000
2A70  0000
2A72  504F 554E 4420     1120  POUND    DC    C'POUND ',X'A',X'0',X'0' *             1 TO FFFF       MOS11200
2A78  000A
2A7A  0000
2A7C  0000
                         1121  *                                                                        MOS11210
                         1122  ************************************************************************   MOS11220
                         1123  *                                                                        MOS11230
2A7E  4C4F 4C49 4D20     1124  LOLIM    DC    C'LOLIM ',X'0',Z(LEVELIN),X'1FFE' *     0000 TO 1FFE    MOS11240
2A84  0000
2A86  22AA
2A88  1FFE
2A8A  4849 4C49 4D20     1125  HILIM    DC    C'HILIM ',X'1FFF',Z(LEVELIN),X'1FFF' *  0000 TO 1FFF    MOS11250
2A90  1FFF
2A92  22AA
2A94  1FFF
```

```
                          1127  ************************************************************************   MOS11270
                          1128  *                                                                        MOS11280
      0000 2A96           1129  OPTEND2  EQU   *                                                         MOS11290
      0000 2A96           1130  OPTEND   EQU   OPTEND2                                                   MOS11300
                          1131  *                                                                        MOS11310
2A96  4F50 5449 4F4E      1132  OPTION   DC    C'OPTION',X'0',X'0',X'0'                                  MOS11320
2A9C  0000
2A9E  0000
2AA0  0000
2AA2  5255 4E20 2020      1133  RUN      DC    C'RUN   ',X'0',X'0',X'0'                                 MOS11330
2AA8  0000
2AAA  0000
2AAC  0000
2AAE  FFFF                1134           DC    -1                                                       MOS11340
                          1135  ************************************************************************   MOS11350
                          1136  *                                                                        MOS11360
2AB0  48E0 2A30           1137  INIT     LH    R14,TEST+6                                               MOS11370
2AB4  C6E0 8000           1138           OHI   R14,X'8000'          FORCE TEST 0                        MOS11380
2AB8  40E0 2A30           1139           STH   R14,TEST+6                                               MOS11390
2ABC  08EF                1140           LDAR  R14,LINK             SAVE RETURN ADDRESS                 MOS11400
2ABE  2411                1141           LIS   R1,1                                                     MOS11410
2AC0  DE10 200E           1142           OC    R1,NORM              PUT DISPLAY IN NORMAL MODE          MOS11420
2AC4  2531                1143           LCS   R3,1                                                     MOS11430
2AC6  41D0 2AE6           1144           BAL   R13,INIT1            TEST LOW MEMORY WITH -1             MOS11440
2ACA  C830 AAAA           1145           LHI   R3,X'AAAA'                                               MOS11450
2ACE  41D0 2AE6           1146           BAL   R13,INIT1            TEST LOW MEMORY WITH AAAA           MOS11460
2AD2  C830 5555           1147           LHI   R3,X'5555'                                               MOS11470
2AD6  41D0 2AE6           1148           BAL   R13,INIT1            TEST LOW MEMORY WITH 5555           MOS11480
2ADA  2430                1149           LIS   R3,0                                                     MOS11490
2ADC  41D0 2AE6           1150           BAL   R13,INIT1            TEST LOW MEMORY WITH 0              MOS11500
2AE0  41F0 28BA           1151           BAL   LINK,LCORE           RE-INITIALIZE LOW MEMORY            MOS11510
2AE4  030E                1152           BR    R14                  RETURN TO INITRET (EXEC)            MOS11520
                          1153  *                                                                        MOS11530
                          1154  *---------------------------------                                       MOS11540
                          1155  *                                                                        MOS11550
2AE6  2460                1156  INIT1    LIS   R6,0                                                     MOS11560
2AE8  2472                1157           LIS   R7,2                                                     MOS11570
2AEA  C880 003A           1158           LHI   R8,X'3A'                                                 MOS11580
2AEE  4036 0000           1159  INIT2    STH   R3,0(R6)             STORE PATTERN IN LOW MEMORRY        MOS11590
2AF2  C160 2AEE           1160           BXLE  R6,INIT2                                                 MOS11600
2AF6  2460                1161           LIS   R6,0                                                     MOS11610
2AF8  9426                1162  INIT3    EXBR  R2,R6                                                    MOS11620
2AFA  9812                1163           WHR   R1,R2                DISPLAY ADDRESS UNDER TEST          MOS11630
2AFC  4846 0000           1164           LH    R4,0(R6)                                                 MOS11640
2B00  0543                1165           CLAR  R4,R3                VERIFY IF LOW MEMORY IS GOOD        MOS11650
2B02  2333                1166           BES   INIT4                                                    MOS11660
2B04  41F0 3542           1167           BAL   LINK,ERROR           NO, BRANCH                          MOS11670
2B08  C160 2AF8           1168  INIT4    BXLE  R6,INIT3             YES, FINISH VERIFYING LOW MWEMORY   MOS11680
2B0C  030D                1169           BR    R13                  RETURN TO INIT ROUTINE              MOS11690
                          1170  *                                                                        MOS11700
                          1171  *---------------------------------                                       MOS11710
                          1172  *                                                                        MOS11720
2B0E  C850 362C           1173  HILOPRT  LHI   R5,HILOMSG          UNCONDITIONALLY PRINT:              MOS11730
```

EXEC - ETPE R03-06 (16 BIT/STRIPED & MODIFIED)

```
2B12  4050 299C          1174           STH   R5,ISITERR                                          MOS11740
2B16  41F0 2652          1175           BAL   LINK,PRINT        "LOLIM > HILIM IS ILLEGAL"          MOS11750
2B1A  4300 20BE          1176           B     OPTIN             ABORT TESTING SEQUENCE            MOS11760
                         1177  *                                                                  MOS11770
                         1178  ************************************************************************MOS11780
                         1179  *                                                                  MOS11790
2B1E  5331 3620 3139 2D31 1180  TITLE    DC    C'S16 19-197 MOS MEMORY TEST PART 2 '               MOS11800
2B26  3937 204D 4F53 204D
2B2E  454D 4F52 5920 5445
2B36  5354 2050 4152 5420
2B3E  3220
2B40  3036 2D32 3034 4630 1181           DC    C'06-204F02R01'   *                         ***     MOS11810
2B48  3252 3031
2B4C  0D0A               1182           DC    X'0D0A'                                             MOS11820
                         1183  *                                                                  MOS11830
                         1184  *                                                                  MOS11840
2B4E  FE00               1185  DEFTESTS DCX   FE00              DEFINES TESTS 0,1,2,3,4,5,& 6       MOS11850
                         1186  *                                                                  MOS11860
2B50  0008               1187  MAXTST   DC    H'8'              DEFINES TESTS 0,1,2,3,4,5,6,7,& 8   MOS11870
                         1188  *                               AS LEGAL TEST NUMBERS.             MOS11880
                         1189  *                                                                  MOS11890
                         1190  *  TESTS TABLE                                                     MOS11900
                         1191  *                                                                  MOS11910
2B54                     1192           ALIGN 4                                                   MOS11920
2B54  2B66               1193  TESTS    DC    A(TEST0)          *                         ***     MOS11930
2B56  2BBC               1194           DC    A(TEST1)                                            MOS11940
2B58  2C4E               1195           DC    A(TEST2)                                            MOS11950
2B5A  2D66               1196           DC    A(TEST3)                                            MOS11960
2B5C  2E2E               1197           DC    A(TEST4)                                            MOS11970
2B5E  2F92               1198           DC    A(TEST5)                                            MOS11980
2B60  3108               1199           DC    A(TEST6)                                            MOS11990
2B62  3298               1200           DC    A(TEST7)                                            MOS12000
2B64  3398               1201           DC    A(TEST8)                                            MOS12010
                         1202  *                                                                  MOS12020
                         1203  ************************************************************************MOS12030
                         1204  *        END   ETPE R03-05 (MODIFIED)                        ***     MOS12040
```

TEST 0

```
                        1206  *       TEST 0                    MEMORY SEARCH TEST                    MOS12060
                        1207  *                                                                       MOS12070
                        1208  *       PURPOSE:                                                        MOS12080
                        1209  *             THIS UTILITY ENABLES THE USER TO LIST EXISTANT,            MOS12090
                        1210  *             RESPONSIVE LIMITS OF MEMORY.                              MOS12100
                        1211  *                                                                       MOS12110
                        1212  *       ASSUMPTIONS:                                                    MOS12120
                        1213  *             MINIMUM MEMORY ALLOWABLE IS 16K BYTES.                    MOS12130
                        1214  *                                                                       MOS12140
                        1215  *       DESIGN SPECIFICATIONS:                                          MOS12150
                        1216  *             1. IF HILIM = 0, FORCE MEMORY LIMITS OF 0000 - 1FFF.      MOS12160
                        1217  *             2. IF HILIM IS NOT ZERO, PRINT MEMORY LIMITS UNDER TEST.  MOS12170
                        1218  *                                                                       MOS12180
                        1219  *       OPTIONS:       NONE                                             MOS12190
                        1220  *                                                                       MOS12200
                        1221  *       HOW TO RUN THE TEST:                                            MOS12210
                        1222  *             ENTER "RUN" AND THE AVAILABLE MEMORY LOCATIONS WILL        MOS12220
                        1223  *             BE PRINTED ON THE LIST DEVICE IN CONTIGUIOUS BLOCKS.       MOS12230
                        1224  *                                                                       MOS12240
                        1225  *       NOTE:                                                           MOS12250
                        1226  *                THIS TEST RESETS "LOLIM" AND "HILIM" TO CORRESPOND      MOS12260
                        1227  *             TO THE BLOCK OF MEMORY PRINTED OUT WHEN "HILIM" = 0.       MOS12270
                        1228  *                IF HILIM IS NOT = 0, THE ASSIGNED "LOLIM" & "HILIM"    MOS12280
                        1229  *             ARE NOT CHANGED BUT, ARE PRINTED OUT ON THE LIST DEVICE.   MOS12290

2B66  C850 361A         1231  TEST0   LDAI  R5,ASMEMMSG       LOAD MESSAGE ADDRESS                  MOS12310
2B6A  4880 2A90         1232          LH    R8,HILIM+6        GET HIGH ADDRESS LIMIT VALUE          MOS12320
2B6E  4230 2B84         1233          BNZ   LIM                                                     MOS12330
2B72  C850 3646         1234          LDAI  R5,AVMEMMSG       LOAD MESSAGE ADDRESS                  MOS12340
2B76  2460              1235  TOCS    LIS   R6,0                                                   MOS12350
2B78  4060 2A84         1236          STH   R6,LOLIM+6        STORE X'0' IN LOLIM                   MOS12360
2B7C  C880 1FFF         1237          LHI   R8,X'1FFF'                                              MOS12370
2B80  4080 2A90         1238          STH   R8,HILIM+6        STORE X'1FFF' IN HILIM                MOS12380
2B84  C580 2000         1239  LIM     CLAI  R8,X'2000'        IS HILIM < X'2000' ?                  MOS12390
2B88  4380 2B76         1240          BNL   TOCS              NO, FORCE NORMAL LIMITS               MOS12400
2B8C  4860 2A84         1241          LH    R6,LOLIM+6                                              MOS12410
2B90  0586              1242          CLAR  R8,R6             YES, IS LOLIM < OR = HILIM ?          MOS12420
2B92  4280 2B0E         1243          BL    HILOPRT           NO, BRANCH                            MOS12430
2B96  2404              1244          LIS   R0,4                                                    MOS12440
2B98  0816              1245          LDAR  R1,R6                                                   MOS12450
2B9A  C820 36C0         1246          LDAI  R2,LOMSG                                                MOS12460
2B9E  41F0 25F2         1247          BAL   LINK,HEXASC       PUT LOLIM IN MEMORY MESSAGE           MOS12470
2BA2  0818              1248          LDAR  R1,R8                                                   MOS12480
2BA4  C820 36C5         1249          LDAI  R2,HIMSG                                                MOS12490
2BA8  41F0 25F2         1250          BAL   LINK,HEXASC       PUT HILIM IN MEMORY MESSAGE           MOS12500
2BAC  41F0 2652         1251          BAL   LINK,PRINT        PRINT MEMORY MESSAGE                  MOS12510
2BB0  C850 36C0         1252          LDAI  R5,LOMSG                                                MOS12520
2BB4  41F0 2652         1253          BAL   LINK,PRINT        PRINT LIMITS OF MEMORY UNDER TEST     MOS12530
2BB8  4300 23CA         1254          B     KEEP7                                                   MOS12540
                        1255  ********************************************************************** MOS12550
                        1256  *       END   TEST 0                                                    MOS12560
```

TEST 1

```
                        1258  *       TEST 1                BIT SET - RESET TEST                        MOS12580
                        1259  *                                                                         MOS12590
                        1260  *       PURPOSE:                                                          MOS12600
                        1261  *            THIS TEST INSURES THAT ALL BITS IN THE AREA OF MEMORY         MOS12610
                        1262  *            BEING TESTED CAN BE BOTH SET AND RESET.                      MOS12620
                        1263  *                                                                         MOS12630
                        1264  *       ASSUMPTIONS:                                                      MOS12640
                        1265  *            NONE                                                         MOS12650
                        1266  *                                                                         MOS12660
                        1267  *       DESIGN SPECIFICATIONS:                                            MOS12670
                        1268  *            1. A WRITE AND THEN A READ IS EXECUTED TO ALL MEMORY         MOS12680
                        1269  *               WITHIN THE "LOLIM" AND "HILIM" LIMITS.                    MOS12690
                        1270  *            2. IF AN ERROR IS DETECTED, THE "SCOPE" OPTION               MOS12700
                        1271  *               DICTATES HOW THE PROGRAM WILL REACT.                      MOS12710
                        1272  *                                                                         MOS12720
                        1273  *       OPTIONS:                                                          MOS12730
                        1274  *            HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST                 MOS12740
                        1275  *            LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                  MOS12750
                        1276  *            SCOPE - ERROR OPTION MODE                                    MOS12760
                        1277  *                0 - PRINT ERROR DATA AND SKIP TO NEXT TEST               MOS12770
                        1278  *                1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST       MOS12780
                        1279  *                2 - PRINT ERROR DATA AND CONTINUE TEST                   MOS12790
                        1280  *                3 - PRINT ERROR DATA AND HALT                            MOS12800
                        1281  *                4 - IGNORE ERROR                                         MOS12810
                        1282  *                5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST           MOS12820
                        1283  *                                                                         MOS12830
                        1284  *       HOW TO RUN THE TEST:                                              MOS12840
                        1285  *            1. ENTER THE "LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA       MOS12850
                        1286  *               THE CONSOLE DEVICE.                                       MOS12860
                        1287  *            2. ENTER "RUN" AND THE TEST WILL EXECUTE.                    MOS12870

2BBC  4860 2A84         1289  TEST1   LH    R6,LOLIM+6          INITIALIZE MEMORY LIMITS              MOS12890
2BC0  4880 2A90         1290          LH    R8,HILIM+6                                                MOS12900
2BC4  2472              1291          LIS   R7,2                                                      MOS12910
2BC6  2411              1292          LIS   R1,1                LOAD DISPLAY ADDRESS                  MOS12920
2BC8  2531              1293          LCS   R3,1                                                      MOS12930
                        1294  *                                                                         MOS12940
2BCA  C360 1FC0         1295  STORE11 THI   R6,X'1FC0'                                                MOS12950
2BCE  2333              1296          BZS   T1.1                                                      MOS12960
2BD0  4036 0000         1297          STH   R3,0(R6)            STORE BACKGROUND OF ALL 1'S           MOS12970
2BD4  C160 2BCA         1298  T1.1    BXLE  R6,STORE11                                                MOS12980
2BD8  C840 3031         1299          LHI   R4,C'01'                                                  MOS12990
2BDC  4040 29E6         1300          STH   R4,ERRNO            ERRNO = C'01'                         MOS13000
2BE0  4860 2A84         1301          LH    R6,LOLIM+6                                                MOS13010
                        1302  *                                                                         MOS13020
2BE4  94A6              1303  READ11  EXBR  R10,R6                                                    MOS13030
2BE6  981A              1304          WHR   R1,R10              DISPLAY ADDRESS UNDER TEST            MOS13040
2BE8  C8F0 23A4         1305          LHI   LINK,TSTEND                                               MOS13050
2BEC  40F0 299A         1306          STH   LINK,BRKVECT                                              MOS13060
2BF0  41F0 27BE         1307          BAL   LINK,TSTBRK         IF "BREAK" GO TO TSTEND ELSE RETURN   MOS13070
2BF4  C360 1FC0         1308          THI   R6,X'1FC0'                                                MOS13080
```

TEST 1

```
2BF8   2337          1309          BZS   RTN11                                          MOS13090
2BFA   4846 0000     1310          LH    R4,0(R6)          LOAD DATA FROM LOC           MOS13100
2BFE   0543          1311          CLAR  R4,R3             IS DATA AT LOC. OK ?         MOS13110
2C00   2333          1312          BES   RTN11             YES, BRANCH                  MOS13120
2C02   41F0 3542     1313          BAL   LINK,ERROR        NO, ERROR                    MOS13130
2C06   C160 2BE4     1314  RTN11   BXLE  R6,READ11        CONTINUE UNTIL DONE          MOS13140
2C0A   4860 2A84     1315          LH    R6,LOLIM+6                                     MOS13150
2C0E   2430          1316          LIS   R3,0                                           MOS13160
                     1317  *                                                            MOS13170
2C10   C360 1FC0     1318  STORE10 THI   R6,X'1FC0'                                    MOS13180
2C14   2333          1319          BZS   T1.2                                           MOS13190
2C16   4036 0000     1320          STH   R3,0(R6)          STORE BACKGROUND OF ALL 0'S  MOS13200
2C1A   C160 2C10     1321  T1.2    BXLE  R6,STORE10                                     MOS13210
2C1E   6110 29E6     1322          AHM   R1,ERRNO          ERRNO = C'02'                MOS13220
2C22   4860 2A84     1323          LH    R6,LOLIM+6                                     MOS13230
                     1324  *                                                            MOS13240
2C26   94A6          1325  READ10  EXBR  R10,R6                                         MOS13250
2C28   981A          1326          WHR   R1,R10            DISPLAY ADDRESS UNDER TEST   MOS13260
2C2A   C8F0 23A4     1327          LHI   LINK,TSTEND                                    MOS13270
2C2E   40F0 299A     1328          STH   LINK,BRKVECT                                   MOS13280
2C32   41F0 27BE     1329          BAL   LINK,TSTBRK       IF "BREAK" GO TO TSTEND ELSE RETURN  MOS13290
2C36   C360 1FC0     1330          THI   R6,X'1FC0'                                     MOS13300
2C3A   2336          1331          BZS   RTN10                                          MOS13310
2C3C   4846 0000     1332          LH    R4,0(R6)          LOAD DATA FROM LOC           MOS13320
2C40   2333          1333          BZS   RTN10             IF DATA = 0, BRANCH (DATA OK)  MOS13330
2C42   41F0 3542     1334          BAL   LINK,ERROR        NO, ERROR                    MOS13340
2C46   C160 2C26     1335  RTN10   BXLE  R6,READ10        CONTINUE UNTIL DONE          MOS13350
                     1336  *                                                            MOS13360
2C4A   4300 23A4     1337          B     TSTEND            END OF TEST (RETURN TO EXEC) MOS13370
                     1338  ********************************************************************  MOS13380
                     1339  *       END   TEST 1                                         MOS13390
```

TEST 2

```
                        1341  *       TEST 2                  MARCHING PATTERN TEST                   MOS13410
                        1342  *                                                                       MOS13420
                        1343  *       PURPOSE:                                                        MOS13430
                        1344  *            THIS TEST CHECKS THAT THREE DIFFERENT BASE PATTERNS         MOS13440
                        1345  *            CAN BE WRITTEN, COMPLEMENTED, AND MARCHED THROUGH THE      MOS13450
                        1346  *            AVAILABLE MEMORY WITHOUT ERROR.                            MOS13460
                        1347  *                                                                       MOS13470
                        1348  *       ASSUMPTIONS:                                                    MOS13480
                        1349  *            MINIMUM 16KB MOS MEMORY                                    MOS13490
                        1350  *                                                                       MOS13500
                        1351  *       DESIGN SPECIFICATIONS:                                          MOS13510
                        1352  *            1. (IN ASCENDING ORDER) WRITE AND READ THE BASE PATTERN.    MOS13520
                        1353  *            2. (IN DESCENDING ORDER) WRITE AND READ THE                 MOS13530
                        1354  *               COMPLEMENT PATTERN.                                     MOS13540
                        1355  *                                                                       MOS13550
                        1356  *       OPTIONS:                                                        MOS13560
                        1357  *            LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                MOS13570
                        1358  *            HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST               MOS13580
                        1359  *            SCOPE - ERROR OPTION MODE                                  MOS13590
                        1360  *                0 - PRINT ERROR DATA AND SKIP TO NEXT TEST             MOS13600
                        1361  *                1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST     MOS13610
                        1362  *                2 - PRINT ERROR DATA AND CONTINUE TEST                 MOS13620
                        1363  *                3 - PRINT ERROR DATA AND HALT                          MOS13630
                        1364  *                4 - IGNORE ERROR                                       MOS13640
                        1365  *                5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST         MOS13650
                        1366  *                                                                       MOS13660
                        1367  *       HOW TO RUN THE TEST:                                            MOS13670
                        1368  *            1. ENTER THE "LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA      MOS13680
                        1369  *              THE CONSOLE DEVICE.                                      MOS13690
                        1370  *            2. ENTER "RUN" AND THE TEST WILL EXECUTE.                   MOS13700

2C4E  2411              1372  TEST2   LIS   R1,1            LOAD DISPLAY ADDRESS                    MOS13720
2C50  C840 2920         1373          LHI   R4,MM0                                                    MOS13730
2C54  4040 003E         1374          STH   R4,X'3E'          SET NEW MM POINTER                      MOS13740
2C58  24A0              1375          LIS   R10,0                                                     MOS13750
2C5A  25B1              1376          LCS   R11,1                                                     MOS13760
2C5C  24D0              1377          LIS   R13,0             W/BACKGROUND = 0'S                      MOS13770
2C5E  41E0 2C8C         1378          BAL   R14,CHKLOC        DO A SINGLE DISTURB TEST (MIN-MAX)      MOS13780
                        1379  *                                                                       MOS13790
2C62  25A1              1380          LCS   R10,1                                                     MOS13800
2C64  24B0              1381          LIS   R11,0             W/BACKGROUND = 1'S                      MOS13810
2C66  41E0 2C8C         1382          BAL   R14,CHKLOC        DO A SINGLE DISTURB TEST (MIN-MAX)      MOS13820
                        1383  *                                                                       MOS13830
2C6A  24D2              1384          LIS   R13,2             W/BACKGROUND = A'S                      MOS13840
2C6C  41E0 2C8C         1385          BAL   R14,CHKLOC        DO A SINGLE DISTURB TEST (MIN-MAX)      MOS13850
                        1386  *                                                                       MOS13860
2C70  24A0              1387          LIS   R10,0                                                     MOS13870
2C72  25B1              1388          LCS   R11,1             W/BACKGROUND = 5'S                      MOS13880
2C74  41E0 2C8C         1389          BAL   R14,CHKLOC        DO A SINGLE DISTURB TEST (MIN-MAX)      MOS13890
                        1390  *                                                                       MOS13900
2C78  C8D0 0080         1391          LHI   R13,X'80'         W/BACKGROUND = 64-0'S, 64-1'S, ETC      MOS13910
```

TEST 2

```
2C7C  41E0 2C8C          1392          BAL   R14,CHKLOC        DO A SINGLE DISTURB TEST (MIN-MAX)     MOS13920
                         1393  *                                                                      MOS13930
2C80  25A1               1394          LCS   R10,1                                                  MOS13940
2C82  24B0               1395          LIS   R11,0             W/BACKGROUND = 64-1'S, 64-0'S, ETC     MOS13950
2C84  41E0 2C8C          1396          BAL   R14,CHKLOC        DO A SINGLE DISTURB TEST (MIN-MAX)     MOS13960
                         1397  *                                                                      MOS13970
2C88  4300 23A4          1398          B     TSTEND            END OF TEST (RETURN TO EXEC)           MOS13980
                         1399  *                                                                      MOS13990
                         1400  ************************************************************************MOS14000
                         1401  *                                                                      MOS14010
2C8C  4860 2A84          1402  CHKLOC  LH    R6,LOLIM+6        INITIALIZE MEMORY LIMITS               MOS14020
2C90  4880 2A90          1403          LH    R8,HILIM+6                                               MOS14030
2C94  2472               1404          LIS   R7,2                                                   MOS14040
                         1405  *                                                                      MOS14050
2C96  C360 1FC0          1406  CHKLOC1 THI   R6,X'1FC0'                                             MOS14060
2C9A  2338               1407          BZS   CHKLOC25                                               MOS14070
2C9C  083A               1408          LDAR  R3,R10            STORE APPROPRIATE BACKGROUND PATTERN   MOS14080
2C9E  C36D 0000          1409          THI   R6,0(R13)                                              MOS14090
2CA2  2332               1410          BZS   CHKLOC2                                                MOS14100
2CA4  083B               1411          LDAR  R3,R11                                                 MOS14110
2CA6  4036 0000          1412  CHKLOC2 STH   R3,0(R6)           IN MEMORY                           MOS14120
2CAA  C160 2C96          1413  CHKLOC25 BXLE R6,CHKLOC1         FROM LOLIM TO HILIM                 MOS14130
2CAE  4860 2A84          1414          LH    R6,LOLIM+6                                             MOS14140
                         1415  *                                                                      MOS14150
2CB2  C840 3033          1416  CHKLOC3 LHI   R4,C'03'                                               MOS14160
2CB6  4040 29E6          1417          STH   R4,ERRNO          ERRNO = C'03'                        MOS14170
2CBA  94C6               1418          EXBR  R12,R6                                                 MOS14180
2CBC  981C               1419          WHR   R1,R12            DISPLAY ADDRESS UNDER TEST           MOS14190
2CBE  C8F0 23A4          1420          LHI   LINK,TSTEND                                            MOS14200
2CC2  40F0 299A          1421          STH   LINK,BRKVECT                                           MOS14210
2CC6  41F0 27BE          1422          BAL   LINK,TSTBRK       IF "BREAK" GO TO TSTEND ELSE RETURN  MOS14220
2CCA  C360 1FC0          1423          THI   R6,X'1FC0'                                             MOS14230
2CCE  4330 2D00          1424          BZ    CHKLOC6                                                MOS14240
2CD2  083A               1425          LDAR  R3,R10            GET APPROPRIATE BACKGROUND PATTERN   MOS14250
2CD4  C36D 0000          1426          THI   R6,0(R13)                                              MOS14260
2CD8  2332               1427          BZS   CHKLOC4                                                MOS14270
2CDA  083B               1428          LDAR  R3,R11                                                 MOS14280
2CDC  4846 0000          1429  CHKLOC4 LH    R4,0(R6)          GET DATA FROM LOC UNDER TEST         MOS14290
2CE0  0543               1430          CLAR  R4,R3             EQUAL ?                              MOS14300
2CE2  2333               1431          BES   CHKLOC5           YES, BRANCH                          MOS14310
2CE4  41F0 3542          1432          BAL   LINK,ERROR        NO, ERROR                            MOS14320
2CE8  C730 FFFF          1433  CHKLOC5 XHI   R3,-1             COMPLEMENT DATA PATTERN              MOS14330
2CEC  4036 0000          1434          STH   R3,0(R6)          STORE C.D.P. AT LOC                  MOS14340
2CF0  6110 29E6          1435          AHM   R1,ERRNO          ERRNO = C'04'                        MOS14350
2CF4  4846 0000          1436          LH    R4,0(R6)          GET DATA FROM LOC UNDER TEST         MOS14360
2CF8  0543               1437          CLAR  R4,R3             DATA = C.D.P. ?                      MOS14370
2CFA  2333               1438          BES   CHKLOC6           YES, BRANCH                          MOS14380
2CFC  41F0 3542          1439          BAL   LINK,ERROR        NO, ERROR                            MOS14390
2D00  C160 2CB2          1440  CHKLOC6 BXLE  R6,CHKLOC3        CONTINUE UNTIL DONE(INCREMENTING)    MOS14400
2D04  4860 2A90          1441          LH    R6,HILIM+6                                             MOS14410
2D08  C460 FFFE          1442          NHI   R6,X'FFFE'                                             MOS14420
2D0C  4880 2A84          1443          LH    R8,LOLIM+6        ESTABLISH MEMORY LIMITS              MOS14430
2D10  2572               1444          LCS   R7,2                                                   MOS14440
```

TEST 2

```
                        1445  *                                                                    MOS14450
2D12   083B             1446  CHKLOC7  LDAR  R3,R11          GET C.D.P. FOR LOC UNDER TEST        MOS14460
2D14   C36D 0000        1447           THI   R6,0(R13)                                            MOS14470
2D18   2332             1448           BZS   CHKLOC8                                              MOS14480
2D1A   083A             1449           LDAR  R3,R10                                               MOS14490
2D1C   C840 3035        1450  CHKLOC8  LHI   R4,C'05'                                            MOS14500
2D20   4040 29E6        1451           STH   R4,ERRNO         ERRNO = C'05'                       MOS14510
2D24   94C6             1452           EXBR  R12,R6                                               MOS14520
2D26   981C             1453           WHR   R1,R12           DISPLAY ADDRESS UNDER TEST          MOS14530
2D28   C8F0 23A4        1454           LHI   LINK,TSTEND                                          MOS14540
2D2C   40F0 299A        1455           STH   LINK,BRKVECT                                         MOS14550
2D30   41F0 27BE        1456           BAL   LINK,TSTBRK      IF "BREAK" GO TO TSTEND ELSE RETURN MOS14560
2D34   C360 1FC0        1457           THI   R6,X'1FC0'                                           MOS14570
2D38   4330 2D60        1458           BZ    CHKLOC10                                             MOS14580
2D3C   4846 0000        1459           LH    R4,0(R6)         GET DATA FROM LOC UNDER TEST        MOS14590
2D40   0543             1460           CLAR  R4,R3            DATA = C.D.P. ?                     MOS14600
2D42   2333             1461           BES   CHKLOC9          YES, BRANCH                         MOS14610
2D44   41F0 3542        1462           BAL   LINK,ERROR       NO, ERROR                           MOS14620
2D48   C730 FFFF        1463  CHKLOC9  XHI   R3,-1            COMPLEMENT C.D.P. (O.D.P.)          MOS14630
2D4C   4036 0000        1464           STH   R3,0(R6)         STORE PATTERN AT LOC                MOS14640
2D50   6110 29E6        1465           AHM   R1,ERRNO         ERRNO = C'06'                       MOS14650
2D54   4846 0000        1466           LH    R4,0(R6)         GET DATA FROM LOC UNDER TEST        MOS14660
2D58   0543             1467           CLAR  R4,R3            DATA = O.D.P. ?                     MOS14670
2D5A   2333             1468           BES   CHKLOC10         YES, BRANCH                         MOS14680
2D5C   41F0 3542        1469           BAL   LINK,ERROR       NO, ERROR                           MOS14690
2D60   C060 2D12        1470  CHKLOC10 BXH   R6,CHKLOC7       CONTINUE UNTIL DONE(DECREMENTING)   MOS14700
                        1471  *                                                                    MOS14710
2D64   030E             1472           BR    R14              RETURN                              MOS14720
                        1473  *                                                                    MOS14730
                        1474  ************************************************************************MOS14740
                        1475  *        END   TEST 2                                                MOS14750
```

```
                                1477  *       TEST 3                  0 & 1 WALK TEST                                 MOS14770
                                1478  *                                                                               MOS14780
                                1479  *       PURPOSE:                                                                MOS14790
                                1480  *             THIS TEST WALKS A 0 THROUGH A FIELD OF 1'S AND A 1                MOS14800
                                1481  *             THROUGH A FIELD OF 0'S.                                           MOS14810
                                1482  *                                                                               MOS14820
                                1483  *       ASSUMPTIONS:                                                            MOS14830
                                1484  *             MINIMUM 16KB MOS MEMORY                                           MOS14840
                                1485  *                                                                               MOS14850
                                1486  *       DESIGN SPECIFICATIONS:                                                  MOS14860
                                1487  *             1. WITH A BACKGROUND OF ALL 1'S, A 0 IS WALKED THROUGH            MOS14870
                                1488  *                EACH HALFWORD OF MEMORY. A READ AND COMPARE IS DONE             MOS14880
                                1489  *                ON EACH LOCATION.                                              MOS14890
                                1490  *             2. WITH A BACKGROUND OF ALL 0'S, A 1 IS WALKED THROUGH            MOS14900
                                1491  *                EACH HALFWORD OF MEMORY. A COMPARE IS DONE ON EACH              MOS14910
                                1492  *                LOCATION.                                                      MOS14920
                                1493  *                                                                               MOS14930
                                1494  *       OPTIONS:                                                                MOS14940
                                1495  *             LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                       MOS14950
                                1496  *             HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST                      MOS14960
                                1497  *             SCOPE - ERROR OPTION MODE                                         MOS14970
                                1498  *                 0 - PRINT ERROR DATA AND SKIP TO NEXT TEST                    MOS14980
                                1499  *                 1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST            MOS14990
                                1500  *                 2 - PRINT ERROR DATA AND CONTINUE TEST                        MOS15000
                                1501  *                 3 - PRINT ERROR DATA AND HALT                                 MOS15010
                                1502  *                 4 - IGNORE ERROR                                              MOS15020
                                1503  *                 5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST                MOS15030
                                1504  *                                                                               MOS15040
                                1505  *       HOW TO RUN THE TEST:                                                    MOS15050
                                1506  *             1. ENTER THE "LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA            MOS15060
                                1507  *                THE CONSOLE DEVICE.                                            MOS15070
                                1508  *             2. ENTER "RUN" AND THE TEST WILL EXECUTE.                         MOS15080

2D66  2411                    1510  TEST3   LIS   R1,1              LOAD DISPLAY ADDRESS                            MOS15100
2D68  4860 2A84               1511          LH    R6,LOLIM+6        INITIALIZE MEMORY LIMITS                        MOS15110
2D6C  4880 2A90               1512          LH    R8,HILIM+6                                                        MOS15120
2D70  2472                    1513          LIS   R7,2                                                              MOS15130
2D72  C840 2920               1514          LHI   R4,MM0                                                            MOS15140
2D76  4040 003E               1515          STH   R4,X'3E'          SET NEW MM POINTER                              MOS15150
2D7A  2531                    1516          LCS   R3,1                                                              MOS15160
                              1517  *                                                                               MOS15170
2D7C  C360 1FC0               1518  STORE31 THI   R6,X'1FC0'                                                        MOS15180
2D80  2333                    1519          BZS   T3S0                                                              MOS15190
2D82  4036 0000               1520          STH   R3,0(R6)          STORE BACKGROUND OF ALL 1'S                     MOS15200
2D86  C160 2D7C               1521  T3S0    BXLE  R6,STORE31                                                        MOS15210
2D8A  4860 2A84               1522          LH    R6,LOLIM+6                                                        MOS15220
2D8E  C840 3037               1523          LHI   R4,C'07'                                                          MOS15230
2D92  4040 29E6               1524          STH   R4,ERRNO          ERRNO = C'07'                                   MOS15240
                              1525  *                                                                               MOS15250
2D96  C8D0 0010               1526  T3S1    LHI   R13,16                                                            MOS15260
2D9A  94A6                    1527          EXBR  R10,R6                                                            MOS15270
```

TEST 3

```
2D9C  981A          1528          WHR   R1,R10            DISPLAY ADDRESS UNDER TEST              MOS15280
2D9E  C8F0 23A4     1529          LHI   LINK,TSTEND                                              MOS15290
2DA2  40F0 299A     1530          STH   LINK,BRKVECT                                            MOS15300
2DA6  41F0 27BE     1531          BAL   LINK,TSTBRK       IF "BREAK" GO TO TSTEND ELSE RETURN     MOS15310
2DAA  C360 1FC0     1532          THI   R6,X'1FC0'                                              MOS15320
2DAE  4330 2DD0     1533          BZ    T3S3.4                                                  MOS15330
2DB2  C8C0 8000     1534          LHI   R12,X'8000'       LOAD R12 (BIT 0 SET)                    MOS15340
2DB6  2531          1535  T3S2    LCS   R3,1              SET ALL BITS IN R3                      MOS15350
2DB8  073C          1536          XAR   R3,R12            RESET A BIT (0-15) IN R3                MOS15360
2DBA  4036 0000     1537          STH   R3,0(R6)          STORE DATA AT LOC                       MOS15370
2DBE  4846 0000     1538          LH    R4,0(R6)          GET DATA FROM LOC                       MOS15380
2DC2  0543          1539          CLAR  R4,R3             DATA EQUAL ?                            MOS15390
2DC4  2333          1540          BES   T3S3              YES, BRANCH                             MOS15400
2DC6  41F0 3542     1541          BAL   LINK,ERROR        NO, ERROR                               MOS15410
2DCA  90C1          1542  T3S3    SRHLS R12,1             WALK 0 THRU HALFWORD OF 1'S             MOS15420
2DCC  27D1          1543          SIS   R13,1             DONE W/THIS HALFWORD ?                  MOS15430
2DCE  203C          1544          BNZS  T3S2              NO, BRANCH UNTIL FINISHED               MOS15440
2DD0  C160 2D96     1545  T3S3.4  BXLE  R6,T3S1           CONTINUE UNTIL DONE(INCREMENTING)       MOS15450
2DD4  4860 2A84     1546          LH    R6,LOLIM+6                                              MOS15460
2DD8  2430          1547          LIS   R3,0                                                    MOS15470
                    1548  *                                                                     MOS15480
2DDA  C360 1FC0     1549  STORE30 THI   R6,X'1FC0'                                              MOS15490
2DDE  2333          1550          BZS   T3S3.6                                                  MOS15500
2DE0  4036 0000     1551          STH   R3,0(R6)          STORE BACKGROUND OF ALL 0'S             MOS15510
2DE4  C160 2DDA     1552  T3S3.6  BXLE  R6,STORE30                                              MOS15520
2DE8  4860 2A84     1553          LH    R6,LOLIM+6                                              MOS15530
2DEC  6110 29E6     1554          AHM   R1,ERRNO          ERRNO = C'08'                           MOS15540
                    1555  *                                                                     MOS15550
2DF0  C8D0 0010     1556  T3S4    LHI   R13,16                                                  MOS15560
2DF4  94A6          1557          EXBR  R10,R6                                                  MOS15570
2DF6  981A          1558          WHR   R1,R10            DISPLAY ADDRESS UNDER TEST              MOS15580
2DF8  C8F0 23A4     1559          LHI   LINK,TSTEND                                             MOS15590
2DFC  40F0 299A     1560          STH   LINK,BRKVECT                                            MOS15600
2E00  41F0 27BE     1561          BAL   LINK,TSTBRK       IF "BREAK" GO TO TSTEND ELSE RETURN     MOS15610
2E04  C360 1FC0     1562          THI   R6,X'1FC0'                                              MOS15620
2E08  4330 2E26     1563          BZ    T3S7                                                    MOS15630
2E0C  C830 8000     1564          LHI   R3,X'8000'        LOAD R3 (BIT 0 SET)                     MOS15640
                    1565  *                                                                     MOS15650
2E10  4036 0000     1566  T3S5    STH   R3,0(R6)          STORE DATA AT LOC                       MOS15660
2E14  4846 0000     1567          LH    R4,0(R6)          GET DATA FROM LOC                       MOS15670
2E18  0543          1568          CLAR  R4,R3             DATA EQUAL ?                            MOS15680
2E1A  2333          1569          BES   T3S6              YES, BRANCH                             MOS15690
2E1C  41F0 3542     1570          BAL   LINK,ERROR        NO, ERROR                               MOS15700
2E20  9031          1571  T3S6    SRHLS R3,1              WALK BIT THRU HALFWORD                  MOS15710
2E22  27D1          1572          SIS   R13,1             DONE W/THIS HALFWORD ?                  MOS15720
2E24  203A          1573          BNZS  T3S5              NO, BRANCH UNTIL FINISHED               MOS15730
2E26  C160 2DF0     1574  T3S7    BXLE  R6,T3S4           CONTINUE UNTIL DONE (INCREMENTING)      MOS15740
                    1575  *                                                                     MOS15750
2E2A  4300 23A4     1576          B     TSTEND            END OF TEST (RETURN TO EXEC)            MOS15760
                    1577  ************************************************************************MOS15770
                    1578  *       END   TEST 3                                                    MOS15780
```

```
                                1580  *       TEST 4                    DOUBLE OPERATION COLUMN DISTURB TEST   MOS15800
                                1581  *                                                                        MOS15810
                                1582  *       PURPOSE:                                                       MOS15820
                                1583  *            THIS TEST CHECKS THAT A DOUBLE OPERATION ON AN ADJACENT    MOS15830
                                1584  *            COLUMN DOES NOT DISTURB THE TEST COLUMN.                  MOS15840
                                1585  *                                                                      MOS15850
                                1586  *       ASSUMPTIONS:                                                   MOS15860
                                1587  *            MINIMUM 16 KB MOS MEMORY                                  MOS15870
                                1588  *                                                                      MOS15880
                                1589  *       DESIGN SPECIFICATIONS:                                         MOS15890
                                1590  *            1. WITH 6 DIFFERENT BACKROUND PATTERSN, A W-R-WC-          MOS15900
                                1591  *               RC-W-R-WC-RC SERIES IS EXECUTED AT EACH LOCATION.      MOS15910
                                1592  *            2. A COMPARE IS DONE UPON EACH READ OPERATION.             MOS15920
                                1593  *            3. A TEST (COMPARISON) OF THE REST OF MEMORY IS DONE       MOS15930
                                1594  *               AFTER EACH SERIES OF OPERATIONS.                       MOS15940
                                1595  *                                                                      MOS15950
                                1596  *       OPTIONS:                                                       MOS15960
                                1597  *            LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST               MOS15970
                                1598  *            HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST              MOS15980
                                1599  *            SCOPE - ERROR OPTION MODE                                 MOS15990
                                1600  *                0 - PRINT ERROR DATA AND SKIP TO NEXT TEST            MOS16000
                                1601  *                1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST    MOS16010
                                1602  *                2 - PRINT ERROR DATA AND CONTINUE TEST                MOS16020
                                1603  *                3 - PRINT ERROR DATA AND HALT                         MOS16030
                                1604  *                4 - IGNORE ERROR                                      MOS16040
                                1605  *                5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST        MOS16050
                                1606  *                                                                      MOS16060
                                1607  *       HOW TO RUN THE TEST                                            MOS16070
                                1608  *            1. ENTER THE "LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA     MOS16080
                                1609  *               THE CONSOLE DEVICE.                                    MOS16090
                                1610  *            2. ENTER "RUN" AND THE TEST WILL EXECUTE.                 MOS16100


2E2E  2411          1612  TEST4   LIS   R1,1              LOAD DISPLAY ADDRESS                               MOS16120
2E30  24A0          1613          LIS   R10,0                                                               MOS16130
2E32  25B1          1614          LCS   R11,1                                                               MOS16140
2E34  24D0          1615          LIS   R13,0              W/BACKGROUND = 0'S                               MOS16150
2E36  41E0 2E4C     1616          BAL   R14,CHKCOL         DO A DOUBLE OPERATION COLUMN                     MOS16160
                    1617  *                                DISTURB AND COMPLEMENT TEST                      MOS16170
2E3A  24D2          1618          LIS   R13,2              W/BACKGROUND = 5'S                               MOS16180
2E3C  41E0 2E4C     1619          BAL   R14,CHKCOL         DO A DOUBLE OPERATION COLUMN                     MOS16190
                    1620  *                                DISTURB AND COMPLEMENT TEST                      MOS16200
2E40  C8D0 0080     1621          LHI   R13,X'80'          W/BACKGROUND = 64-0'S, 64-1'S, ETC.              MOS16210
2E44  41E0 2E4C     1622          BAL   R14,CHKCOL         DO A DOUBLE OPERATION COLUMN                     MOS16220
                    1623  *                                DISTURB AND COMPLEMENT TEST                      MOS16230
2E48  4300 23A4     1624          B     TSTEND             END OF TEST (RETURN TO EXEC)                     MOS16240
                    1625  *                                                                                 MOS16250
                    1626  ************************************************************************         MOS16260
                    1627  *                                                                                 MOS16270
2E4C  4860 2A84     1628  CHKCOL  LH    R6,LOLIM+6         INITIALIZE MEMORY LIMITS                         MOS16280
2E50  4880 2A90     1629          LH    R8,HILIM+6                                                          MOS16290
2E54  2472          1630          LIS   R7,2                                                                MOS16300
```

TEST 4

```
                        1631  *                                                                    MOS16310
2E56  C360 1FC0         1632  CHKCOL1   THI   R6,X'1FC0'                                          MOS16320
2E5A  2338              1633            BZS   CHKCOL25                                           MOS16330
2E5C  083A              1634            LDAR  R3,R10          GET PROPER BACKGROUND PATTERN        MOS16340
2E5E  C36D 0000         1635            THI   R6,0(R13)                                          MOS16350
2E62  2332              1636            BZS   CHKCOL2                                            MOS16360
2E64  083B              1637            LDAR  R3,R11                                             MOS16370
2E66  4036 0000         1638  CHKCOL2   STH   R3,0(R6)        STORE BACKGROUND PATTERN             MOS16380
2E6A  C160 2E56         1639  CHKCOL25  BXLE  R6,CHKCOL1      TO ALL OF MEMORY UNDER TEST          MOS16390
2E6E  4860 2A84         1640            LH    R6,LOLIM+6                                         MOS16400
                        1641  *                                                                    MOS16410
2E72  C840 3033         1642  CHKCOL3   LHI   R4,C'03'                                           MOS16420
2E76  4040 29E6         1643            STH   R4,ERRNO        ERRNO = C'03'                        MOS16430
2E7A  94C6              1644            EXBR  R12,R6                                             MOS16440
2E7C  981C              1645            WHR   R1,R12          DISPLAY ADDRESS UNDER TEST           MOS16450
2E7E  C8F0 23A4         1646            LHI   LINK,TSTEND                                        MOS16460
2E82  40F0 299A         1647            STH   LINK,BRKVECT                                       MOS16470
2E86  41F0 27BE         1648            BAL   LINK,TSTBRK     IF "BREAK" GO TO TSTEND ELSE RETURN  MOS16480
2E8A  C360 1FC0         1649            THI   R6,X'1FC0'                                         MOS16490
2E8E  4330 2EF8         1650            BZ    CHKCOL8                                            MOS16500
2E92  083A              1651            LDAR  R3,R10          GET ORIGINAL DATA PATTERN (O.D.P.)   MOS16510
2E94  C36D 0000         1652            THI   R6,0(R13)                                          MOS16520
2E98  2332              1653            BZS   CHKCOL4                                            MOS16530
2E9A  083B              1654            LDAR  R3,R11                                             MOS16540
2E9C  4846 0000         1655  CHKCOL4   LH    R4,0(R6)        GET DATA FROM LOC                    MOS16550
2EA0  0543              1656            CLAR  R4,R3           DATA EQUAL ?                         MOS16560
2EA2  2333              1657            BES   CHKCOL5         YES, BRANCH                          MOS16570
2EA4  41F0 3542         1658            BAL   LINK,ERROR      NO, ERROR                            MOS16580
2EA8  C730 FFFF         1659  CHKCOL5   XHI   R3,-1           COMPLEMENT DATA PATTERN (C.D.P.)     MOS16590
2EAC  4036 0000         1660            STH   R3,0(R6)        STORE C.D.P. AT LOC                  MOS16600
2EB0  6110 29E6         1661            AHM   R1,ERRNO        ERRNO = C'04'                        MOS16610
2EB4  4846 0000         1662            LH    R4,0(R6)        GET DATA FROM LOC                    MOS16620
2EB8  0543              1663            CLAR  R4,R3           DATA EQUAL ?                         MOS16630
2EBA  2333              1664            BES   CHKCOL6         YES, BRANCH                          MOS16640
2EBC  41F0 3542         1665            BAL   LINK,ERROR      NO, ERROR                            MOS16650
2EC0  C730 FFFF         1666  CHKCOL6   XHI   R3,-1           COMPLEMENT C.D.P. (O.D.P.)           MOS16660
2EC4  4036 0000         1667            STH   R3,0(R6)        STORE O.D.P. AT LOC                  MOS16670
2EC8  C840 3039         1668            LHI   R4,C'09'                                           MOS16680
2ECC  4040 29E6         1669            STH   R4,ERRNO        ERRNO = C'09'                        MOS16690
2ED0  4846 0000         1670            LH    R4,0(R6)        GET DATA FROM LOC                    MOS16700
2ED4  0543              1671            CLAR  R4,R3           DATA EQUAL ?                         MOS16710
2ED6  2333              1672            BES   CHKCOL7         YES, BRANCH                          MOS16720
2ED8  41F0 3542         1673            BAL   LINK,ERROR      NO, ERROR                            MOS16730
2EDC  C730 FFFF         1674  CHKCOL7   XHI   R3,-1           COMPLEMENT O.D.P.(C.D.P.)            MOS16740
2EE0  4036 0000         1675            STH   R3,0(R6)        STORE C.D.P. AT LOC                  MOS16750
2EE4  C840 3041         1676            LHI   R4,C'0A'                                           MOS16760
2EE8  4040 29E6         1677            STH   R4,ERRNO        ERRNO = C'0A'                        MOS16770
2EEC  4846 0000         1678            LH    R4,0(R6)        GET DATA FROM LOC                    MOS16780
2EF0  0543              1679            CLAR  R4,R3           DATA EQUAL ?                         MOS16790
2EF2  2333              1680            BES   CHKCOL8         YES, BRANCH                          MOS16800
2EF4  41F0 3542         1681            BAL   LINK,ERROR      NO, ERROR                            MOS16810
2EF8  C160 2E72         1682  CHKCOL8   BXLE  R6,CHKCOL3      CONTINUE UNTIL DONE(INCREMENTING     MOS16820
2EFC  4860 2A90         1683            LH    R6,HILIM+6      INITIALIZE MEMORY LIMITS             MOS16830
```

TEST 4

```
2F00  C460 FFFE  1684          NHI   R6,-2              (HILIM MUST BE EVEN)                    MOS16840
2F04  4880 2A84  1685          LH    R8,LOLIM+6                                                 MOS16850
2F08  2572       1686          LCS   R7,2                                                       MOS16860
                 1687  *                                                                        MOS16870
2F0A  083B       1688  CHKCOL9 LDAR  R3,R11             GET COMPLEMENT DATA PATTERN(C.D.P.)      MOS16880
2F0C  C36D 0000  1689          THI   R6,0(R13)                                                  MOS16890
2F10  2332       1690          BZS   CHKCOLA                                                    MOS16900
2F12  083A       1691          LDAR  R3,R10                                                     MOS16910
2F14  C840 3035  1692  CHKCOLA LHI   R4,C'05'                                                   MOS16920
2F18  4040 29E6  1693          STH   R4,ERRNO           ERRNO = C'05'                           MOS16930
2F1C  94C6       1694          EXBR  R12,R6                                                     MOS16940
2F1E  981C       1695          WHR   R1,R12             DISPLAY ADDRESS UNDER TEST              MOS16950
2F20  C8F0 23A4  1696          LHI   LINK,TSTEND                                                MOS16960
2F24  40F0 299A  1697          STH   LINK,BRKVECT                                               MOS16970
2F28  41F0 27BE  1698          BAL   LINK,TSTBRK        IF "BREAK" GO TO TSTEND ELSE RETURN     MOS16980
2F2C  C360 1FC0  1699          THI   R6,X'1FC0'                                                 MOS16990
2F30  4330 2F8C  1700          BZ    CHKCOLE                                                    MOS17000
2F34  4846 0000  1701          LH    R4,0(R6)           GET DATA FROM LOC                       MOS17010
2F38  0543       1702          CLAR  R4,R3              DATA EQUAL ?                            MOS17020
2F3A  2333       1703          BES   CHKCOLB            YES, BRANCH                             MOS17030
2F3C  41F0 3542  1704          BAL   LINK,ERROR         NO, ERROR                               MOS17040
2F40  C730 FFFF  1705  CHKCOLB XHI   R3,-1              COMPLEMENT C.D.P.(O.D.P.)               MOS17050
2F44  4036 0000  1706          STH   R3,0(R6)           STORE O.D.P. AT LOC                     MOS17060
2F48  6110 29E6  1707          AHM   R1,ERRNO           ERRNO = C'06'                           MOS17070
2F4C  4846 0000  1708          LH    R4,0(R6)           GET DATA FROM LOC                       MOS17080
2F50  0543       1709          CLAR  R4,R3              DATA EQUAL ?                            MOS17090
2F52  2333       1710          BES   CHKCOLC            YES, BRANCH                             MOS17100
2F54  41F0 3542  1711          BAL   LINK,ERROR         NO, ERROR                               MOS17110
2F58  C730 FFFF  1712  CHKCOLC XHI   R3,-1              COMPLEMENT O.D.P. (C.D.P.)              MOS17120
2F5C  4036 0000  1713          STH   R3,0(R6)           STORE C.D.P. AT LOC                     MOS17130
2F60  C840 3042  1714          LHI   R4,C'0B'                                                   MOS17140
2F64  4040 29E6  1715          STH   R4,ERRNO           ERRNO = C'0B'                           MOS17150
2F68  4846 0000  1716          LH    R4,0(R6)           GET DATA FROM LOC                       MOS17160
2F6C  0543       1717          CLAR  R4,R3              DATA EQUAL ?                            MOS17170
2F6E  2333       1718          BES   CHKCOLD            YES, BRANCH                             MOS17180
2F70  41F0 3542  1719          BAL   LINK,ERROR         NO, ERROR                               MOS17190
2F74  C730 FFFF  1720  CHKCOLD XHI   R3,-1              COMPLEMENT C.D.P.(O.D.P.)               MOS17200
2F78  4036 0000  1721          STH   R3,0(R6)           STORE O.D.P. AT LOC                     MOS17210
2F7C  6110 29E6  1722          AHM   R1,ERRNO           ERRNO = C'0C'                           MOS17220
2F80  4846 0000  1723          LH    R4,0(R6)           GET DATA FROM LOC                       MOS17230
2F84  0543       1724          CLAR  R4,R3              DATA EQUAL ?                            MOS17240
2F86  2333       1725          BES   CHKCOLE            YES, BRANCH                             MOS17250
2F88  41F0 3542  1726          BAL   LINK,ERROR         NO, ERROR                               MOS17260
2F8C  C060 2F0A  1727  CHKCOLE BXH   R6,CHKCOL9         CONTINUE UNTIL DONE(DECREMENTING)       MOS17270
                 1728  *                                                                        MOS17280
2F90  030E       1729          BR    R14                RETURN                                  MOS17290
                 1730  *                                                                        MOS17300
                 1731  ************************************************************************ MOS17310
                 1732  *       END   TEST 4                                                     MOS17320
```

TEST 5

```
                    1734  *       TEST 5                  SHORT COUNT RELOCATABLE                 MOS17340
                    1735  *                               HAMMER DISTURB TEST                     MOS17350
                    1736  *                                                                       MOS17360
                    1737  *       PURPOSE:                                                        MOS17370
                    1738  *            THIS TEST EXECUTES A SMALL, RELOCATABLE PROGRAM             MOS17380
                    1739  *            (16 HALFWORDS) THROUGHOUT MEMORY, LOOKING FOR "SOFT"       MOS17390
                    1740  *            FAILURES.                                                  MOS17400
                    1741  *                                                                       MOS17410
                    1742  *       ASSUMPTIONS:                                                    MOS17420
                    1743  *            MINIMUM 16KB MOS MEMORY                                    MOS17430
                    1744  *                                                                       MOS17440
                    1745  *       DESIGN SPECIFICATIONS:                                          MOS17450
                    1746  *            1. THE TEST PROGRAM MUST USE 16 HALFWORDS HEAVILY,         MOS17460
                    1747  *               DUE TO THE INTERNAL CHIP ADDRESSING SCHEME.             MOS17470
                    1748  *            2. THE TEST RUNS WITH A BACKGROUND PATTERN EQUAL TO        MOS17480
                    1749  *               THE CONTENTS OF "DATA".                                 MOS17490
                    1750  *            3. THE TEST LOOPS 10 TIMES(INTERNAL TO THE MODULE).        MOS17500
                    1751  *            4. THE ROUTINE (ROUTIN) IS EXECUTED 10 TIMES. THE ENTIRE   MOS17510
                    1752  *               ROUTINE IS THEN RELOCATED IN MEMORY AND EXECUTED 10     MOS17520
                    1753  *               TIMES. "ROUTIN" IS MOVED UP IN MEMORY UNTIL THE LAST    MOS17530
                    1754  *               TEST HALFWORD IS IN THE LAST MEMORY HALFWORD.            MOS17540
                    1755  *                                                                       MOS17550
                    1756  *       OPTIONS:                                                        MOS17560
                    1757  *            LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                MOS17570
                    1758  *            HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST               MOS17580
                    1759  *            DATA  - 16-BIT DATA PATTERN USED AS BACKGROUND             MOS17590
                    1760  *            POUND - NUMBER OF TIMES A'S & 5'S ARE POUNDED IN MEMORY    MOS17600
                    1761  *            SCOPE - ERROR OPTION MODE                                  MOS17610
                    1762  *                0 - PRINT ERROR DATA AND SKIP TO NEXT TEST             MOS17620
                    1763  *                1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST     MOS17630
                    1764  *                2 - PRINT ERROR DATA AND CONTINUE TEST                 MOS17640
                    1765  *                3 - PRINT ERROR DATA AND HALT                          MOS17650
                    1766  *                4 - IGNORE ERROR                                       MOS17660
                    1767  *                5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST         MOS17670
                    1768  *                                                                       MOS17680
                    1769  *       HOW TO RUN THE TEST:                                            MOS17690
                    1770  *            1. ENTER THE"LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA      MOS17700
                    1771  *               THE CONSOLE DEVICE.                                     MOS17710
                    1772  *            2. ENTER "RUN" AND THE TEST WILL EXECUTE.                  MOS17720

2F92  4860 2A84     1774  TEST5   LH    R6,LOLIM+6          INITIALIZE MEMORY LIMITS            MOS17740
2F96  4880 2A90     1775          LH    R8,HILIM+6                                              MOS17750
2F9A  0806          1776          LDAR  R0,R6               R0 = LOLIM                        MOS17760
2F9C  0898          1777          LDAR  R9,R8               R9 = HILIM                        MOS17770
2F9E  2472          1778          LIS   R7,2                                                  MOS17780
2FA0  2411          1779          LIS   R1,1                LOAD DISPLAY ADDRESS              MOS17790
2FA2  C8A0 5555     1780          LHI   R10,X'5555'                                           MOS17800
2FA6  C8B0 AAAA     1781          LHI   R11,X'AAAA'                                           MOS17810
2FAA  C850 003E     1782          LHI   R5,ENDMOV5-STLOOP+2 LOAD TEST ADDRESS DIFFERENCE      MOS17820
2FAE  2521          1783          LCS   R2,1                                                  MOS17830
                    1784  *                                                                     MOS17840
```

TEST 5

```
2FB0  C360 1FC0  1785  T5S1     THI   R6,X'1FC0'                                    MOS17850
2FB4  2333       1786          BZS   T5S1.5                                         MOS17860
2FB6  4026 0000  1787          STH   R2,0(R6)          STORE BACKGROUND OF ALL 1'S   MOS17870
2FBA  C160 2FB0  1788  T5S1.5  BXLE  R6,T5S1                                        MOS17880
2FBE  4860 2A84  1789          LH    R6,LOLIM+6                                    MOS17890
2FC2  0B85       1790          SHR   R8,R5             ESTABLISH HIGH LIMIT        MOS17900
2FC4  4210 3522  1791          BM    T8LOPRT           IF NEGATIVE, ERROR          MOS17910
2FC8  C585 0046  1792          CLAI  R8,X'46'(R5)      MEMORY SPECIFIED LARGE ENOUGH ?  MOS17920
2FCC  4280 3522  1793          BL    T8LOPRT           NO, ERROR                   MOS17930
2FD0  4080 3718  1794          STH   R8,VHILIM         SAVE TESTING HILIM VALUE    MOS17940
2FD4  41E0 2FFE  1795          BAL   R14,SFTSET         DO SHORT HAMMER DISTURB TEST  MOS17950
                 1796  *                                                           MOS17960
2FD8  4860 2A84  1797          LH    R6,LOLIM+6        INITIALIZE MEMORY LIMITS    MOS17970
2FDC  0889       1798          LDAR  R8,R9             GET BG BXLE HILIM VALUE     MOS17980
2FDE  2420       1799          LIS   R2,0                                          MOS17990
2FE0  C360 1FC0  1800  T5S2     THI   R6,X'1FC0'                                    MOS18000
2FE4  2333       1801          BZS   T5S2.5                                        MOS18010
2FE6  4026 0000  1802          STH   R2,0(R6)          STORE BACKGROUND OF ALL 0'S   MOS18020
2FEA  C160 2FE0  1803  T5S2.5  BXLE  R6,T5S2                                       MOS18030
2FEE  4860 2A84  1804          LH    R6,LOLIM+6                                    MOS18040
2FF2  4880 3718  1805          LH    R8,VHILIM         RESTORE TESTING HILIM VALUE  MOS18050
2FF6  41E0 2FFE  1806          BAL   R14,SFTSET        DO SHORT HAMMER DISTURB TEST  MOS18060
                 1807  *                                                           MOS18070
2FFA  4300 23A4  1808          B     TSTEND            END OF TEST (RETURN TO EXEC)  MOS18080
                 1809  *                                                           MOS18090
                 1810  ************************************************************  MOS18100
                 1811  *                                                           MOS18110
2FFE  48C0 2A78  1812  SFTSET   LH    R12,POUND+6       LOAD EXECUTION COUNTER      MOS18120
3002  94F6       1813          EXBR  R15,R6                                        MOS18130
3004  981F       1814          WHR   R1,R15            DISPLAY ADDRESS UNDER TEST  MOS18140
3006  C8F0 23A4  1815          LHI   LINK,TSTEND                                   MOS18150
300A  40F0 299A  1816          STH   LINK,BRKVECT                                  MOS18160
300E  41F0 27BE  1817          BAL   LINK,TSTBRK       IF "BREAK" GO TO TSTEND ELSE RETURN  MOS18170
3012  C360 1FC0  1818          THI   R6,X'1FC0'                                    MOS18180
3016  4330 30A6  1819          BZ    BGTST7                                        MOS18190
301A  D000 3740  1820          STM   R0,MOSSAVE+32     SAVE REGISTERS (0-F)        MOS18200
301E  0816       1821          LDAR  R1,R6                                         MOS18210
3020  D120 30AC  1822          LM    R2,STLOOP         RELOCATE PROGRAM IN MEMORY  MOS18220
3024  D021 0002  1823          STM   R2,2(R1)                                      MOS18230
3028  D120 30C8  1824          LM    R2,STLOOP+28                                  MOS18240
302C  D021 001E  1825          STM   R2,30(R1)                                     MOS18250
3030  D1E0 30E4  1826          LM    R14,STLOOP+56                                 MOS18260
3034  D0E1 003A  1827          STM   R14,58(R1)                                    MOS18270
3038  D100 3740  1828          LM    R0,MOSSAVE+32     RESTORE REGISTERS (0-F)     MOS18280
303C  4060 3716  1829          STH   R6,VLOLIM         SAVE LOCATION UNDER TEST    MOS18290
3040  41D6 0002  1830          BAL   R13,2(R6)         BRANCH TO "STLOOP"          MOS18300
                 1831  *                                                           MOS18310
                 1832  *       TEST BACKGROUND PATTERN                             MOS18320
                 1833  *                                                           MOS18330
3044  D000 3740  1834  BGTST    STM   R0,MOSSAVE+32                                 MOS18340
3048  C840 3045  1835          LHI   R4,C'0E'                                      MOS18350
304C  4040 29E6  1836          STH   R4,ERRNO          ERRNO = C'0E'               MOS18360
3050  0832       1837          LDAR  R3,R2             LOAD BACKGROUND PATTERN     MOS18370
```

TEST 5

```
3052  0886            1838          LDAR  R8,R6                                    MOS18380
3054  08C6            1839          LDAR  R12,R6          SAVE LOC UNDER TEST      MOS18390
3056  0B85            1840          SAR   R8,R5           ESTABLISH START OF SUB-4 MOS18400
3058  0860            1841          LDAR  R6,R0           GET START OF BACKGROUND TEST AREA MOS18410
305A  0568            1842          CLAR  R6,R8           IS LOLIM NOT < START OF SUB-2 ? MOS18420
305C  238E            1843          BNLS  BGTST3          NO, BRANCH TO TEST HIGH MEMORY MOS18430
305E  C360 1FC0       1844  BGTST1  THI   R6,X'1FC0'                              MOS18440
3062  2335            1845          BZS   BGTST2                                   MOS18450
3064  4846 0000       1846          LH    R4,0(R6)        GET DATA FROM BACKGROUND LOC MOS18460
3068  0543            1847          CLAR  R4,R3           DATA EQUAL ?             MOS18470
306A  2134            1848          BNES  BGTST2.5                                 MOS18480
306C  C160 305E       1849  BGTST2  BXLE  R6,BGTST1       CONTINUE LOW BACKGROUND TESTING MOS18490
3070  2304            1850          BS    BGTST3                                   MOS18500
                      1851  *                                                      MOS18510
3072  41F0 3542       1852  BGTST2.5 BAL  LINK,ERROR      PRINT ERROR TTOE         MOS18520
3076  2205            1853          BS    BGTST2                                   MOS18530
                      1854  *                                                      MOS18540
3078  086C            1855  BGTST3  LDAR  R6,R12          RESTORE LOC UNDER TEST   MOS18550
307A  0A65            1856          AHR   R6,R5                                    MOS18560
307C  2662            1857          AIS   R6,2            START AT LOC+2 AFTER SUB MOS18570
307E  0889            1858          LDAR  R8,R9           GET END OF BACKGROUND TEST AREA MOS18580
3080  0568            1859          CLAR  R6,R8           IS BG LOC < TEST LOC ?   MOS18590
3082  238E            1860          BNLS  BGTST6          NO, BRANCH TO TEST NEXT LOC MOS18600
3084  C360 1FC0       1861  BGTST4  THI   R6,X'1FC0'                              MOS18610
3088  2335            1862          BZS   BGTST5                                   MOS18620
308A  4846 0000       1863          LH    R4,0(R6)        GET DATA FROM BG LOC     MOS18630
308E  0543            1864          CLAR  R4,R3           DATA EQUAL ?             MOS18640
3090  2134            1865          BNES  BGTST5.5        NO, ERROR                MOS18650
3092  C160 3084       1866  BGTST5  BXLE  R6,BGTST4       CONTINUE HIGH BACKGROUND TESTING MOS18660
3096  2304            1867          BS    BGTST6                                   MOS18670
                      1868  *                                                      MOS18680
3098  41F0 3542       1869  BGTST5.5 BAL  LINK,ERROR      PRINT ERROR TTOE         MOS18690
309C  2205            1870          BS    BGTST5                                   MOS18700
                      1871  *                                                      MOS18710
309E  D100 3740       1872  BGTST6  LM    R0,MOSSAVE+32   RESTORE REGISTERS        MOS18720
30A2  4026 0000       1873          STH   R2,0(R6)        RESTORE BACKGROUND PATTERN AT LOC MOS18730
30A6  C160 2FFE       1874  BGTST7  BXLE  R6,SFTSET       CONTINUE UNTIL DONE (INCREMENTING) MOS18740
30AA  030E            1875          BR    R14                                      MOS18750
                      1876  *                                                      MOS18760
                      1877  ************************************************************** MOS18770
                      1878  *       (R6)                                           MOS18780
30AC  40A6 0000       1879  STLOOP  STH   R10,0(R6)       STORE FIRST DATA PATTERN MOS18790
30B0  45A6 0000       1880          CLH   R10,0(R6)       DATA EQUAL ?             MOS18800
30B4  4230 30E8       1881          BNE   FITERR1         NO,BRANCH TO ERROR       MOS18810
30B8  40B6 0000       1882  LOPRTN1 STH   R11,0(R6)       YES, STORE SECOND DATA PATTERN MOS18820
30BC  45B6 0000       1883          CLH   R11,0(R6)       DATA EQUAL?              MOS18830
30C0  4230 30EC       1884          BNE   FITERR2         NO, BRANCH TO ERROR      MOS18840
30C4  0A65            1885  LOPRTN2 AHR   R6,R5                                    MOS18850
30C6  40A6 0000       1886          STH   R10,0(R6)                                MOS18860
30CA  45A6 0000       1887          CLH   R10,0(R6)                                MOS18870
30CE  4230 30E8       1888          BNE   FITERR1                                  MOS18880
30D2  40B6 0000       1889  LOPRTN3 STH   R11,0(R6)                                MOS18890
30D6  45B6 0000       1890          CLH   R11,0(R6)                                MOS18900
```

TEST 5

```
30DA   4230 30EC          1891           BNE   FITERR2                                                  MOS18910
30DE   0B65               1892           SHR   R6,R5                                                    MOS18920
30E0   27C1               1893  LOPRTN4  SIS   R12,1              YES,DECREMENT POUND COUNTER           MOS18930
30E2   4236 0002          1894           BNZ   2(R6)              BRANCH IF NOT DONE                    MOS18940
30E6   030D               1895  LOPRTN5  BR    R13                RETURN                                MOS18950
       0000 30E8           1896  ENDMOV5  EQU   *                  (R6)+62                               MOS18960
                          1897  *                                                                        MOS18970
                          1898  ************************************************************************* MOS18980
                          1899  *                                                                        MOS18990
30E8   083A               1900  FITERR1  LDAR  R3,R10             LOAD EXPECTED DATA                    MOS19000
30EA   2302               1901           BS    FITERR3                                                  MOS19010
                          1902  *                                                                        MOS19020
30EC   083B               1903  FITERR2  LDAR  R3,R11                                                   MOS19030
                          1904  *                                                                        MOS19040
30EE   C840 3044          1905  FITERR3  LHI   R4,C'0D'                                                 MOS19050
30F2   4040 29E6          1906           STH   R4,ERRNO            ERRNO = C'0D'                         MOS19060
30F6   4846 0000          1907           LH    R4,0(R6)                                                 MOS19070
30FA   41F0 3542          1908           BAL   LINK,ERROR          PRINT ERROR TT0D                      MOS19080
30FE   4560 3716          1909           CLH   R6,VLOLIM           IS LOC UNDER TEST TRUE ?              MOS19090
3102   033D               1910           BER   R13                 YES, RETURN                           MOS19100
3104   0B65               1911           SAR   R6,R5               NO, CORRECT THE LOC                   MOS19110
3106   030D               1912           BR    R13                 RETURN                                MOS19120
                          1913  *                                                                        MOS19130
                          1914  ************************************************************************* MOS19140
                          1915  *        END   TEST 5                                                    MOS19150
```

TEST 6

```
                        1917  *       TEST 6                  DIAGONAL GALPAT TEST                    MOS19170
                        1918  *                                                                       MOS19180
                        1919  *       PURPOSE:                                                        MOS19190
                        1920  *            THE TEST RUNS A GALLOPING PATTERN ON ALL DIAGONALS OF      MOS19200
                        1921  *            EACH 4K RAM AND CHECKS THAT NO BACKGROUND LOCATIONS        MOS19210
                        1922  *            HAVE CHANGED DURING THE DIAGONAL TEST.                     MOS19220
                        1923  *                                                                       MOS19230
                        1924  *       ASSUMPTIONS:                                                    MOS19240
                        1925  *            MINIMUM 16KB MOS MEMORY                                    MOS19250
                        1926  *                                                                       MOS19260
                        1927  *       DESIGN SPECIFICATIONS:                                          MOS19270
                        1928  *            1. THE TEST IS EXECUTED FOR EACH OF THE SIX BACKGROUND     MOS19280
                        1929  *               PATTERNS.                                               MOS19290
                        1930  *            2. AN ALTERNATE R-W-R-W-R-W-R-W-R(ETC) IS DONE TO A TEST   MOS19300
                        1931  *               CELL AND FOLLOWING CELLS ON THE DIAGONAL SUCESSIVELY.    MOS19310
                        1932  *            3. THE TEST CELL IS MOVED ONE CELL UP THE DIAGONAL AND      MOS19320
                        1933  *               THE PROCEDURE IS REPEATED.                              MOS19330
                        1934  *            4. AFTER THE DIAGONAL IS COMPLETED, THE BACKROUND           MOS19340
                        1935  *               PATTERN IN THE REST OF EACH 4K CHIP AS TESTED.           MOS19350
                        1936  *            5. THE DIAGONAL IS THEN MOVED AND 2-4 IS REPEATED UNTIL     MOS19360
                        1937  *               ALL DIAGONALS HAVE BEEN TRAVERSED.                      MOS19370
                        1938  *                                                                       MOS19380
                        1939  *       OPTIONS:                                                        MOS19390
                        1940  *            LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                MOS19400
                        1941  *            HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST               MOS19410
                        1942  *            SCOPE - ERROR OPTION MODE                                  MOS19420
                        1943  *                0 - PRINT ERROR DATA AND SKIP TO NEXT TEST             MOS19430
                        1944  *                1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST     MOS19440
                        1945  *                2 - PRINT ERROR DATA AND CONTINUE TEST                 MOS19450
                        1946  *                3 - PRINT ERROR DATA AND HALT                          MOS19460
                        1947  *                4 - IGNORE ERROR                                       MOS19470
                        1948  *                5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST         MOS19480
                        1949  *                                                                       MOS19490
                        1950  *       HOW TO RUN THE TEST:                                            MOS19500
                        1951  *            1. ENTER THE "LOLIM", "HILIM", AND "SCOPE" OPTIONS VIA      MOS19510
                        1952  *               THE CONSOLE DEVICE.                                     MOS19520
                        1953  *            2. ENTER "RUN" AND THE TEST WILL EXECUTE.                   MOS19530

3108  2410              1955  TEST6   LIS   R1,0                                                      MOS19550
310A  4010 3716         1956          STH   R1,VLOLIM         VLOLIM = 0                            MOS19560
310E  2404              1957          LIS   R0,4                                                     MOS19570
3110  C820 36C0         1958          LHI   R2,LOMSG                                                 MOS19580
3114  41F0 25F2         1959          BAL   LINK,HEXASC       PUT 0 IN ADDRESS MESSAGE               MOS19590
3118  C810 1FFF         1960          LHI   R1,X'1FFF'                                               MOS19600
311C  4010 3718         1961          STH   R1,VHILIM         VHILIM = 1FFF                         MOS19610
3120  C820 36C5         1962          LHI   R2,HIMSG                                                 MOS19620
3124  41F0 25F2         1963          BAL   LINK,HEXASC       PUT 1FFF IN ADDRESS MESSAGE            MOS19630
3128  C850 36A6         1964          LDAI  R5,T6MSG                                                 MOS19640
312C  41F0 2652         1965          BAL   LINK,PRINT        PRINT LIMITS UNDER DIAG. GALPAT TEST   MOS19650
3130  C850 36C0         1966          LDAI  R5,LOMSG                                                 MOS19660
3134  41F0 2652         1967          BAL   LINK,PRINT                                               MOS19670
```

TEST 6

```
3138  2411           1968           LIS   R1,1              LOAD DISPLAY ADDRESS                        MOS19680
313A  C820 0082      1969           LHI   R2,X'82'           LOAD CELL INCREMENT VALUE                   MOS19690
313E  C890 007E      1970           LHI   R9,X'7E'           LOAD TOP OF COLUMN MASK VALUE               MOS19700
3142  C8C0 1FFE      1971           LHI   R12,X'1FFE'        LOAD CHIP LIMIT MASK                        MOS19710
3146  24A0           1972           LIS   R10,0                                                          MOS19720
3148  25B1           1973           LCS   R11,1                                                          MOS19730
314A  24D0           1974           LIS   R13,0              W/BACKGROUND = 0'S                          MOS19740
314C  41E0 317A      1975           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST                     MOS19750
                     1976  *                                                                             MOS19760
3150  25A1           1977           LCS   R10,1                                                          MOS19770
3152  24B0           1978           LIS   R11,0              W/BACKGROUND = 1'S                          MOS19780
3154  41E0 317A      1979           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST                     MOS19790
                     1980  *                                                                             MOS19800
3158  24D2           1981           LIS   R13,2              W/BACKGROUND = A'S/CHIP                     MOS19810
315A  41E0 317A      1982           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST                     MOS19820
                     1983  *                                                                             MOS19830
315E  24A0           1984           LIS   R10,0                                                          MOS19840
3160  25B1           1985           LCS   R11,1              W/BACKGROUND = 5'S/CHIP                     MOS19850
3162  41E0 317A      1986           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST                     MOS19860
                     1987  *                                                                             MOS19870
3166  C8D0 0080      1988           LHI   R13,X'80'           W/BACKGROUND = 64-0'S, 64-1'S, ETC..        MOS19880
316A  41E0 317A      1989           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST                     MOS19890
                     1990  *                                                                             MOS19900
316E  25A1           1991           LCS   R10,1                                                          MOS19910
3170  24B0           1992           LIS   R11,0              W/BACKGROUND = 64-1'S, 64-0'S, ETC..        MOS19920
3172  41E0 317A      1993           BAL   R14,TEST6ALL       DO DIAGONAL GALPAT TEST                     MOS19930
                     1994  *                                                                             MOS19940
3176  4300 23A4      1995           B     TSTEND             END OF TEST (RETURN TO EXEC)                MOS19950
                     1996  *                                                                             MOS19960
                     1997  ********************************************************************************MOS19970
                     1998  *                                                                             MOS19980
317A  4860 3716      1999  TEST6ALL LH    R6,VLOLIM          LOAD AVAILABLE MEMORY LIMITS                MOS19990
317E  4880 3718      2000           LH    R8,VHILIM                                                      MOS20000
3182  2472           2001           LIS   R7,2                                                           MOS20010
                     2002  *                                                                             MOS20020
3184  C360 1FC0      2003  T6S1     THI   R6,X'1FC0'                                                     MOS20030
3188  2338           2004           BZS   T6S2.5                                                         MOS20040
318A  083A           2005           LDAR  R3,R10             GET APPROPRIATE BACKGROUND PATTERN          MOS20050
318C  C36D 0000      2006           THI   R6,0(R13)                                                      MOS20060
3190  2332           2007           BZS   T6S2                                                           MOS20070
3192  083B           2008           LDAR  R3,R11                                                         MOS20080
3194  4036 0000      2009  T6S2     STH   R3,0(R6)           STORE BACKGROUND PATTERN                    MOS20090
3198  C160 3184      2010  T6S2.5   BXLE  R6,T6S1           TO ALL AVAILABLE MEMORY                     MOS20100
                     2011  *                                                                             MOS20110
319C  2400           2012  T6S3     LIS   R0,0              R0 = X0                                     MOS20120
319E  0880           2013  T6S4     LDAR  R8,R0              R8 = TEST CELL                              MOS20130
31A0  0870           2014  T6S5     LDAR  R7,R0              R7 = RUNNING CELL                           MOS20140
31A2  C380 1FC0      2015  T6S6     THI   R8,X'1FC0'                                                     MOS20150
31A6  4330 3220      2016           BZ    INCRTC2                                                        MOS20160
31AA  C370 1FC0      2017           THI   R7,X'1FC0'                                                     MOS20170
31AE  4330 3200      2018           BZ    INCRRC                                                         MOS20180
31B2  0578           2019           CLAR  R7,R8              RUNNING CELL = TEST CALL ?                  MOS20190
31B4  4330 3200      2020           BE    INCRRC             YES, INCREMENT THE RUNNING CELL             MOS20200
```

TEST 6

```
31B8  0868           2021          LDAR  R6,R8          R6 = TEST CELL                          MOS20210
31BA  94F6           2022          EXBR  R15,R6                                                  MOS20220
31BC  981F           2023          WHR   R1,R15         DISPLAY ADDRESS UNDER TEST              MOS20230
31BE  083B           2024          LDAR  R3,R11         LOAD COMPLEMENT DATA PATTERN(C.D.P.)    MOS20240
31C0  C36D 0000      2025          THI   R6,0(R13)                                               MOS20250
31C4  2332           2026          BZS   T6S7                                                   MOS20260
31C6  083A           2027          LDAR  R3,R10                                                  MOS20270
31C8  4036 0000      2028  T6S7    STH   R3,0(R6)       STORE C.D.P. AT TEST CELL LOC           MOS20280
31CC  C840 3130      2029          LHI   R4,C'10'                                                MOS20290
31D0  4040 29E6      2030          STH   R4,ERRNO       ERRNO = C'10'                           MOS20300
31D4  4846 0000      2031          LH    R4,0(R6)       GET TEST CELL DATA                      MOS20310
31D8  0543           2032          CLAR  R4,R3          DATA EQUAL TO C.D.P. ?                  MOS20320
31DA  4230 3288      2033          BNE   T6ER10                                                  MOS20330
31DE  4036 0000      2034  T6S8    STH   R3,0(R6)       STORE C.D.P. AT TC LOC                  MOS20340
31E2  0867           2035          LDAR  R6,R7          R6 = RUNNING CELL                       MOS20350
31E4  6110 29E6      2036          AHM   R1,ERRNO       ERRNO = C'11'                           MOS20360
31E8  083A           2037          LDAR  R3,R10         LOAD O.D.P. AT RUNNING CELL LOC         MOS20370
31EA  C36D 0000      2038          THI   R6,0(R13)                                               MOS20380
31EE  2332           2039          BZS   T6S9                                                    MOS20390
31F0  083B           2040          LDAR  R3,R11                                                  MOS20400
31F2  4846 0000      2041  T6S9    LH    R4,0(R6)       GET RUNNING CELL DATA                   MOS20410
31F6  0543           2042          CLAR  R4,R3          RC DATA = BACKGROUND DATA ?             MOS20420
31F8  4230 3290      2043          BNE   T6ER11                                                  MOS20430
31FC  4036 0000      2044  T6S10   STH   R3,0(R6)       STORE O.D.P. AT RUNNING CELL LOC        MOS20440
                     2045  *                                                                     MOS20450
3200  0867           2046  INCRRC  LDAR  R6,R7          R6 = RUNNING CELL                       MOS20460
3202  0469           2047          NHR   R6,R9                                                   MOS20470
3204  0569           2048          CLAR  R6,R9          RUNNING CELL = TOP OF COLUMN ?          MOS20480
3206  2335           2049          BES   INCRTC         YES, INCREMENT THE TEST CELL            MOS20490
3208  0A72           2050          AHR   R7,R2          NO, INCREMENT RUNNING CELL (+X'82')     MOS20500
320A  047C           2051          NHR   R7,R12         STAY WITHIN CHIP (8KB)                  MOS20510
320C  4300 31A2      2052          B     T6S6           CONTINUE TESTING                        MOS20520
                     2053  *                                                                     MOS20530
3210  0868           2054  INCRTC  LDAR  R6,R8          R6 = TEST CELL                          MOS20540
3212  083A           2055          LDAR  R3,R10         GET APPROPRIATE BACKGROUND PATTERN      MOS20550
3214  C36D 0000      2056          THI   R6,0(R13)                                               MOS20560
3218  2332           2057          BZS   INCRTC1                                                 MOS20570
321A  083B           2058          LDAR  R3,R11                                                  MOS20580
321C  4036 0000      2059  INCRTC1 STH   R3,0(R6)       RESTORE TEST CELL TO BACKGROUND PATRN   MOS20590
3220  0868           2060  INCRTC2 LDAR  R6,R8                                                   MOS20600
3222  0469           2061          NHR   R6,R9                                                   MOS20610
3224  0569           2062          CLAR  R6,R9          TEST CELL = TOP OF COLUMN ?             MOS20620
3226  2335           2063          BES   INCRX0         YES, INCREMENT X0                       MOS20630
3228  0A82           2064          AHR   R8,R2          NO, INCREMENT TEST CELL (+X'82')        MOS20640
322A  048C           2065          NHR   R8,R12         STAY WITHIN CHIP (8KB)                  MOS20650
322C  4300 31A0      2066          B     T6S5           CONTINUE TEST                           MOS20660
                     2067  *                                                                     MOS20670
3230  C8F0 23A4      2068  INCRX0  LHI   LINK,TSTEND                                            MOS20680
3234  40F0 299A      2069          STH   LINK,BRKVECT                                            MOS20690
3238  41F0 27BE      2070          BAL   LINK,TSTBRK    IF "BREAK" GO TO TSTEND ELSE RETURN     MOS20700
323C  D000 3740      2071  CKBG60  STM   R0,MOSSAVE+32  SAVE REGISTERS                          MOS20710
3240  2460           2072          LIS   R6,0                                                    MOS20720
3242  C880 1FFE      2073          LHI   R8,X'1FFE'     STAY WITHIN CHIP (8KB)                  MOS20730
```

TEST 6

```
3246   2472           2074           LIS   R7,2              LOAD INCREMENT VALUE                MOS20740
3248   C840 3045      2075           LHI   R4,C'0E'                                            MOS20750
324C   4040 29E6      2076           STH   R4,ERRNO          ERRNO = C'0E'                       MOS20760
                      2077   *                                                                  MOS20770
3250   C360 1FC0      2078   CKBG61  THI   R6,X'1FC0'                                          MOS20780
3254   4330 326A      2079           BZ    CKBG63                                              MOS20790
3258   083A           2080           LDAR  R3,R10            GET APPROPRIATE BACKGROUND PATTERN  MOS20800
325A   C36D 0000      2081           THI   R6,0(R13)                                           MOS20810
325E   2332           2082           BZS   CKBG62                                              MOS20820
3260   083B           2083           LDAR  R3,R11                                              MOS20830
3262   4846 0000      2084   CKBG62  LH    R4,0(R6)          LOAD BACKGROUND PATTERN             MOS20840
3266   0543           2085           CLAR  R4,R3             DATA EQUAL ?                        MOS20850
3268   2134           2086           BNES  CKBG64                                              MOS20860
326A   C160 3250      2087   CKBG63  BXLE  R6,CKBG61         CONTINUE UNTIL DONE                 MOS20870
326E   2304           2088           BS    CKBG65                                              MOS20880
                      2089   *                                                                  MOS20890
3270   41F0 3542      2090   CKBG64  BAL   LINK,ERROR                                          MOS20900
3274   2205           2091           BS    CKBG63                                              MOS20910
                      2092   *                                                                  MOS20920
3276   D100 3740      2093   CKBG65  LM    R0,MOSSAVE+32     RESTORE REGISTERS                 MOS20930
327A   CA00 0080      2094           AHI   R0,X'80'           INCREMENT X0                      MOS20940
327E   C500 2000      2095           CLAI  R0,X'2000'        WAS THIS THE LAST DIAGONAL ?        MOS20950
3282   4280 319E      2096           BL    T6S4              NO, BRANCH                        MOS20960
3286   030E           2097           BR    R14               YES, RETURN                       MOS20970
                      2098   *                                                                  MOS20980
3288   41F0 3542      2099   T6ER10  BAL   LINK,ERROR         PRINT ERROR TT10                  MOS20990
328C   4300 31DE      2100           B     T6S8                                                MOS21000
                      2101   *                                                                  MOS21010
3290   41F0 3542      2102   T6ER11  BAL   LINK,ERROR         PRINT ERROR TT11                  MOS21020
3294   4300 31FC      2103           B     T6S10                                               MOS21030
                      2104   *                                                                  MOS21040
                      2105   ********************************************************************** MOS21050
                      2106   *       END   TEST 6                                               MOS21060
```

TEST 7

```
                                2108  *       TEST 7                    MEMORY HOLD TEST                        MOS21080
                                2109  *                                                                         MOS21090
                                2110  *       PURPOSE                                                           MOS21100
                                2111  *            THIS TEST CHECKS THE ABILITY OF THE MOS MEMORY REFRESH      MOS21110
                                2112  *            CIRCUIT TO OPERATE IN THE EVENT OF A POWER FAILURE.         MOS21120
                                2113  *                                                                         MOS21130
                                2114  *       ASSUMPTIONS:                                                      MOS21140
                                2115  *            MINIMUM 16KB MOS MEMORY & BATTERY BACK-UP POWER SUPPLY.     MOS21150
                                2116  *                                                                         MOS21160
                                2117  *       DESIGN SPECIFICATIONS:                                            MOS21170
                                2118  *            1. A BACKGROUND PATTERN IS WRITTEN TO ALL MEMORY.           MOS21180
                                2119  *            2. POWER IS REMOVED FOR 30 SECONDS(MINIMUM).               MOS21190
                                2120  *            3. UPON RESTART, THE PROGRAM READS MEMORY 8 TIMES          MOS21200
                                2121  *               CHECKING FOR ERRORS.                                    MOS21210
                                2122  *                                                                         MOS21220
                                2123  *       OPTIONS                                                           MOS21230
                                2124  *            LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                MOS21240
                                2125  *            HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST               MOS21250
                                2126  *            SCOPE - ERROR OPTION MODE                                  MOS21260
                                2127  *                0 - PRINT ERROR DATA AND SKIP TO NEXT TEST             MOS21270
                                2128  *                1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST     MOS21280
                                2129  *                2 - PRINT ERROR DATA AND CONTINUE TEST                 MOS21290
                                2130  *                3 - PRINT ERROR DATA AND HALT                          MOS21300
                                2131  *                4 - IGNORE ERROR                                       MOS21310
                                2132  *                5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST         MOS21320
                                2133  *                                                                       MOS21330
                                2134  *       HOW TO RUN THE TEST:                                            MOS21340
                                2135  *            1. ENTER THE "LOLIM" AND "HILIM" OPTIONS VIA               MOS21350
                                2136  *               THE CONSOLE DEVICE.                                     MOS21360
                                2137  *            2. ENTER "RUN" AND THE TEST WILL EXECUTE.                  MOS21370

3298  4860 2A84                 2139  TEST7   LH    R6,LOLIM+6          INITIALIZE MEMORY LIMITS            MOS21390
329C  4880 2A90                 2140          LH    R8,HILIM+6                                              MOS21400
32A0  2788                      2141          SIS   R8,8                                                    MOS21410
32A2  2478                      2142          LIS   R7,8                                                    MOS21420
32A4  2411                      2143          LIS   R1,1                LOAD DISPLAY ADDRESS                MOS21430
32A6  24A0                      2144          LIS   R10,0               LOAD 4 DATA PATTERNS                MOS21440
32A8  25B1                      2145          LCS   R11,1                                                   MOS21450
32AA  C8C0 AAAA                 2146          LHI   R12,X'AAAA'                                             MOS21460
32AE  C8D0 5555                 2147          LHI   R13,X'5555'                                             MOS21470
                                2148  *                                                                     MOS21480
32B2  C360 1FC0                 2149  T7S1    THI   R6,X'1FC0'                                             MOS21490
32B6  2339                      2150          BZS   T7S1.5                                                  MOS21500
32B8  40A6 0000                 2151          STH   R10,0(R6)                                               MOS21510
32BC  40B6 0002                 2152          STH   R11,2(R6)                                               MOS21520
32C0  40C6 0004                 2153          STH   R12,4(R6)                                               MOS21530
32C4  40D6 0006                 2154          STH   R13,6(R6)           STORE DATA PATTERNS                 MOS21540
32C8  C160 32B2                 2155  T7S1.5  BXLE  R6,T7S1             FROM LOLIM TO HILIM                 MOS21550
32CC  C850 3304                 2156          LHI   R5,T7MM1                                                MOS21560
32D0  4050 003E                 2157          STH   R5,X'3E'            SET VECTOR FOR MM                   MOS21570
                                2158  *                                 ON POWER DOWN                       MOS21580
```

TEST 7

```
                                2159  *                                                                    MOS21590
32D4   C850 36CC                2160  T7OUTMSG LHI   R5,T7MSG          UNCONDITIONALLY PRINT:            MOS21600
32D8   4050 299C                2161           STH   R5,ISITERR                                         MOS21610
32DC   41F0 2652                2162           BAL   LINK,PRINT         "POWER DOWN PROC. FOR 30 SECONDS" MOS21620
32E0   2450                    2163           LIS   R5,0                                               MOS21630
32E2   4050 299C                2164           STH   R5,ISITERR                                         MOS21640
32E6   25E1                    2165           LCS   R14,1              ESTABLISH WAIT COUNTERS           MOS21650
32E8   C820 0080                2166  T7S2     LHI   R2,128                                             MOS21660
                                2167  *                                                                  MOS21670
32EC   2721                    2168  T7S3     SIS   R2,1                                               MOS21680
32EE   2031                    2169           BNZS  T7S3               WAIT 256* SF INSTRUCTION TIMES    MOS21690
32F0   C8F0 23A4                2170           LHI   LINK,TSTEND                                        MOS21700
32F4   40F0 299A                2171           STH   LINK,BRKVECT                                       MOS21710
32F8   41F0 27BE                2172           BAL   LINK,TSTBRK        IF "BREAK" GO TO TSTEND ELSE RETURN MOS21720
32FC   27E1                    2173           SIS   R14,1                                              MOS21730
32FE   203B                    2174           BNZS  T7S2               WAIT 30 SECONDS FOR MM            MOS21740
3300   4300 32D4                2175           B     T7OUTMSG           ON POWER DOWN                     MOS21750
                                2176  *                                                                  MOS21760
                                2177  ********************************************************************** MOS21770
                                2178  *                                                                  MOS21780
3304   C8E0 3312                2179  T7MM1    LHI   R14,T7MM2          SET VECTOR FOR MM                 MOS21790
3308   40E0 003E                2180           STH   R14,X'3E'          ON POWER UP                       MOS21800
330C   C8E0 80F0                2181           LHI   R14,X'80F0'                                          MOS21810
3310   954E                    2182           EPSR  R4,R14             WAIT FOR MM  (PSW = X'80F0')      MOS21820
                                2183  *                                                                  MOS21830
                                2184  ********************************************************************** MOS21840
                                2185  *                                                                  MOS21850
3312   48E0 2008                2186  T7MM2    LH    R14,PSW2                                             MOS21860
3316   950E                    2187           EPSR  R0,R14             PSW = X'30F0'                     MOS21870
3318   C840 2920                2188           LHI   R4,MM0                                               MOS21880
331C   4040 003E                2189           STH   R4,X'3E'           SET NEW MM POINTER                MOS21890
3320   24E8                    2190           LIS   R14,8              LOAD MEMORY CHECK COUNTER         MOS21900
3322   C840 3230                2191           LHI   R4,C'20'                                             MOS21910
3326   4040 29E6                2192           STH   R4,ERRNO           ERRNO = C'20'                     MOS21920
332A   2472                    2193           LIS   R7,2                                                 MOS21930
                                2194  *                                                                  MOS21940
332C   4860 2A84                2195  T7S4     LH    R6,LOLIM+6                                           MOS21950
3330   6110 29E6                2196           AHM   R1,ERRNO           INCREMENT ERRNO (21-28)           MOS21960
                                2197  *                                                                  MOS21970
3334   94F6                    2198  T7S5     EXBR  LINK,R6                                              MOS21980
3336   981F                    2199           WHR   R1,LINK            DISPLAY ADDRESS UNDER TEST        MOS21990
3338   C360 1FC0                2200           THI   R6,X'1FC0'                                           MOS22000
333C   4330 337E                2201           BZ    T7S9                                                 MOS22010
3340   083A                    2202           LDAR  R3,R10             GET FIRST DATA PATTERN            MOS22020
3342   4846 0000                2203           LH    R4,0(R6)           LOAD DATA FROM LOC                MOS22030
3346   0543                    2204           CLAR  R4,R3              DATA EQUAL ?                      MOS22040
3348   2333                    2205           BES   T7S6               YES, BRANCH                       MOS22050
334A   41F0 3542                2206           BAL   LINK,ERROR         NO, ERROR                         MOS22060
334E   083B                    2207  T7S6     LDAR  R3,R11             GET SECOND DATA PATTERN           MOS22070
3350   2662                    2208           AIS   R6,2               INCREMENT LOC COUNTER             MOS22080
3352   4846 0000                2209           LH    R4,0(R6)           LOAD DATA FROM LOC                MOS22090
3356   0543                    2210           CLAR  R4,R3              DATA EQUAL ?                      MOS22100
3358   2333                    2211           BES   T7S7               YES, BRANCH                       MOS22110
```

TEST 7

```
335A   41F0 3542          2212          BAL   LINK,ERROR          NO, ERROR                                  MOS22120
335E   083C               2213  T7S7    LDAR  R3,R12             GET THIRD DATA PATTERN                     MOS22130
3360   2662               2214          AIS   R6,2               INCREMENT LOC COUNTER                      MOS22140
3362   4846 0000          2215          LH    R4,0(R6)           LOAD DATA FROM LOC                         MOS22150
3366   0543               2216          CLAR  R4,R3              DATA EQUAL ?                               MOS22160
3368   2333               2217          BES   T7S8                YES, BRANCH                                MOS22170
336A   41F0 3542          2218          BAL   LINK,ERROR          NO, ERROR                                  MOS22180
336E   083D               2219  T7S8    LDAR  R3,R13             GET FOURTH DATA PATTERN                    MOS22190
3370   2662               2220          AIS   R6,2               INCREMENT LOC COUNTER                      MOS22200
3372   4846 0000          2221          LH    R4,0(R6)           LOAD DATA FROM LOC                         MOS22210
3376   0543               2222          CLAR  R4,R3              DATA EQUAL ?                               MOS22220
3378   2333               2223          BES   T7S9                YES, BRANCH                                MOS22230
337A   41F0 3542          2224          BAL   LINK,ERROR          NO, ERROR                                  MOS22240
337E   C160 3334          2225  T7S9    BXLE  R6,T7S5            CHECK LOLIM TO HILIM                       MOS22250
3382   C8F0 23A4          2226          LHI   LINK,TSTEND                                                    MOS22260
3386   40F0 299A          2227          STH   LINK,BRKVECT                                                   MOS22270
338A   41F0 27BE          2228          BAL   LINK,TSTBRK          IF "BREAK" GO TO TSTEND ELSE RETURN        MOS22280
338E   27E1               2229          SIS   R14,1              CHECKED MEMORY 8 TIMES ?                   MOS22290
3390   4230 332C          2230          BNZ   T7S4               NO, REPEATE                                MOS22300
3394   4300 23A4          2231          B     TSTEND             YES, END OF TEST(RETURN TO EXEC)           MOS22310
                          2232  *                                                                           MOS22320
                          2233  ************************************************************************     MOS22330
                          2234  *       END   TEST 7                                                        MOS22340
```

TEST 8

```
                                2236  *       TEST 8 (OPTIONAL TEST)    LONG COUNT RELOCATABLE                MOS22360
                                2237  *                                 HAMMER DISTURB TEST                   MOS22370
                                2238  *                                                                       MOS22380
                                2239  *       PURPOSE:                                                        MOS22390
                                2240  *            THE TEST EXERCISES THE MOS MEMORY IN AN ENVIRONMENT        MOS22400
                                2241  *            SIMILAR TO THAT OF AN OPERATING SYSTEM.                    MOS22410
                                2242  *                                                                       MOS22420
                                2243  *       ASSUMPTIONS:                                                    MOS22430
                                2244  *            MINIMUM 16KB MOS MEMORY                                    MOS22440
                                2245  *                                                                       MOS22450
                                2246  *       DESIGN SPECIFICATIONS:                                          MOS22460
                                2247  *            THIS IS AN OVERNIGHT TEST DESIGNED TO POINT OUT            MOS22470
                                2248  *            POSSIBLE "SOFT" FAILURE LOCATIONS IN MOS MEMORY.           MOS22480
                                2249  *            (SIMILAR TO TEST 5)                                        MOS22490
                                2250  *                                                                       MOS22500
                                2251  *       OPTIONS:                                                        MOS22510
                                2252  *            LOLIM - 16-BIT LOW LIMIT ADDRESS UNDER TEST                MOS22520
                                2253  *            HILIM - 16-BIT HIGH LIMIT ADDRESS UNDER TEST               MOS22530
                                2254  *            DATA  - 16-BIT BACKGROUND DATA PATTERN                     MOS22540
                                2255  *            SCOPE - ERROR OPTION MODE                                  MOS22550
                                2256  *                0 - PRINT ERROR DATA AND SKIP TO NEXT TEST             MOS22560
                                2257  *                1 - PRINT BAD CHIP NUMBER(S) AND SKIP TO NEXT TEST     MOS22570
                                2258  *                2 - PRINT ERROR DATA AND CONTINUE TEST                 MOS22580
                                2259  *                3 - PRINT ERROR DATA AND HALT                          MOS22590
                                2260  *                4 - IGNORE ERROR                                       MOS22600
                                2261  *                5 - PRINT BAD CHIP NUMBER(S) AND CONTINUE TEST         MOS22610
                                2262  *                                                                       MOS22620
                                2263  *       HOW TO RUN THE TEST:                                            MOS22630
                                2264  *            1. ENTER THE"LOLIM", "HILIM", AND "DATA" OPTIONS VIA       MOS22640
                                2265  *               THE CONSOLE DEVICE.                                     MOS22650
                                2266  *            2. ENTER "RUN" AND THE TEST WILL EXECUTE.                  MOS22660

3398  4860 2A84                 2268  TEST8   LH    R6,LOLIM+6          INITIALIZE MEMORY LIMITS            MOS22680
339C  4880 2A90                 2269          LH    R8,HILIM+6                                              MOS22690
33A0  08A6                      2270          LDAR  R10,R6              R10 = LOLIM                         MOS22700
33A2  08B8                      2271          LDAR  R11,R8              R11 = HILIM                         MOS22710
33A4  0878                      2272          LDAR  R7,R8                                                   MOS22720
33A6  0B76                      2273          SAR   R7,R6                                                   MOS22730
33A8  C570 009E                 2274          CLAI  R7,ENDMOV8-MOVPRG+6 IS HILIM - LOLIM LARGE ENOUGH ?     MOS22740
33AC  4280 3522                 2275          BL    T8LOPRT             IF NOT, BRANCH AND PRINT ERROR      MOS22750
33B0  2411                      2276          LIS   R1,1                LOAD DISPLAY ADDRESS                MOS22760
33B2  4850 2A6C                 2277          LH    R5,DATA+6           LOAD BACKGROUND DATA PATTERN        MOS22770
33B6  2472                      2278          LIS   R7,2                                                    MOS22780
33B8  C820 009A                 2279          LHI   R2,ENDMOV8-MOVPRG+2                                     MOS22790
33BC  C360 1FC0                 2280          THI   R6,X'1FC0'                                              MOS22800
33C0  2133                      2281          BNZS  T8SW                                                    MOS22810
33C2  C860 0040                 2282          LHI   R6,X'40'                                                MOS22820
33C6  4056 0000                 2283  T8SW    STH   R5,0(R6)           STORE BACKGROUND DATA PATTERN       MOS22830
33CA  C160 33C6                 2284  T8SW1   BXLE  R6,T8SW             FROM LOLIM TO HILIM                 MOS22840
33CE  4860 2A84                 2285          LH    R6,LOLIM+6                                              MOS22850
33D2  C360 1FC0                 2286  T8SW2   THI   R6,X'1FC0'                                              MOS22860
```

TEST 8

```
33D6  4230 33DE          2287          BNZ   T8SW3                                                  MOS22870
33DA  2662               2288          AIS   R6,2                                                   MOS22880
33DC  2205               2289          BS    T8SW2                                                  MOS22890
                         2290  *                                                                      MOS22900
33DE  D000 3740          2291  T8SW3   STM   R0,MOSSAVE+32       SAVE REGISTERS (0-F)               MOS22910
33E2  0816               2292          LDAR  R1,R6                                                  MOS22920
33E4  D120 348A          2293          LM    R2,MOVPRG          MOVE SUB INTO TEST AREA            MOS22930
33E8  D021 0002          2294          STM   R2,2(R1)                                               MOS22940
33EC  D120 34A6          2295          LM    R2,MOVPRG+28                                           MOS22950
33F0  D021 001E          2296          STM   R2,30(R1)                                              MOS22960
33F4  D120 34C2          2297          LM    R2,MOVPRG+56                                           MOS22970
33F8  D021 003A          2298          STM   R2,58(R1)                                              MOS22980
33FC  D120 34DE          2299          LM    R2,MOVPRG+84                                           MOS22990
3400  D021 0056          2300          STM   R2,86(R1)                                              MOS23000
3404  D120 34FA          2301          LM    R2,MOVPRG+112                                          MOS23010
3408  D021 0072          2302          STM   R2,114(R1)                                             MOS23020
340C  D1A0 3516          2303          LM    R10,MOVPRG+140                                         MOS23030
3410  D0A1 008E          2304          STM   R10,142(R1)                                            MOS23040
3414  D100 3740          2305          LM    R0,MOSSAVE+32      RESTORE REGISTERS                  MOS23050
3418  C840 2920          2306          LHI   R4,MM0                                                 MOS23060
341C  4040 003E          2307          STH   R4,X'3E'           SET NEW MM POINTER                 MOS23070
3420  0B82               2308          SAR   R8,R2                                                  MOS23080
                         2309  *                                                                      MOS23090
3422  94F6               2310  T8SX    EXBR  R15,R6                                                 MOS23100
3424  981F               2311          WHR   R1,R15             DISPLAY ADDRESS UNDER TEST         MOS23110
3426  C8F0 23A4          2312          LHI   LINK,TSTEND                                            MOS23120
342A  40F0 299A          2313          STH   LINK,BRKVECT                                           MOS23130
342E  41F0 27BE          2314          BAL   LINK,TSTBRK        IF "BREAK" GO TO "OPTIN" ELSE RETURN MOS23140
3432  C840 3044          2315          LHI   R4,C'0D'                                               MOS23150
3436  4040 29E6          2316          STH   R4,ERRNO           ERRNO = C'0D'                      MOS23160
343A  41E6 0002          2317          BAL   R14,2(R6)          BRANCH TO "MOVPRG"                 MOS23170
                         2318  *                                                                      MOS23180
343E  D000 3740          2319          STM   R0,MOSSAVE+32      SAVE REGISTERS (0-F)               MOS23190
3442  0816               2320          LDAR  R1,R6                                                  MOS23200
3444  D121 007C          2321          LM    R2,ENDMOV8-MOVPRG-28(R1) RELOCATE SUB IN MEMORY(+2)    MOS23210
3448  D021 007E          2322          STM   R2,ENDMOV8-MOVPRG-26(R1)                               MOS23220
344C  D121 0060          2323          LM    R2,ENDMOV8-MOVPRG-56(R1)                               MOS23230
3450  D021 0062          2324          STM   R2,ENDMOV8-MOVPRG-54(R1)                               MOS23240
3454  D121 0044          2325          LM    R2,ENDMOV8-MOVPRG-84(R1)                               MOS23250
3458  D021 0046          2326          STM   R2,ENDMOV8-MOVPRG-82(R1)                               MOS23260
345C  D121 0028          2327          LM    R2,ENDMOV8-MOVPRG-112(R1)                              MOS23270
3460  D021 002A          2328          STM   R2,ENDMOV8-MOVPRG-110(R1)                              MOS23280
3464  D121 000C          2329          LM    R2,ENDMOV8-MOVPRG-140(R1)                              MOS23290
3468  D021 000E          2330          STM   R2,ENDMOV8-MOVPRG-138(R1)                              MOS23300
346C  D1A1 0000          2331          LM    R10,0(R1)                                              MOS23310
3470  D0A1 0002          2332          STM   R10,2(R1)                                              MOS23320
3474  D100 3740          2333          LM    R0,MOSSAVE+32      RESTORE REGISTERS (0-F)            MOS23330
                         2334  *                                                                      MOS23340
3478  4056 FFFE          2335          STH   R5,-2(R6)          RESTORE BACKGROUND AT OLD TEST LOC MOS23350
347C  088B               2336          LDAR  R8,R11                                                 MOS23360
347E  0B82               2337          SAR   R8,R2                                                  MOS23370
3480  0568               2338          CLAR  R6,R8              DONE ?                             MOS23380
3482  4280 3422          2339          BL    T8SX               NO, BRANCH (CONTINUE)              MOS23390
```

TEST 8

```
3486  4300 23A4          2340          B     TSTEND            YES, END OF TEST(RETURN TO EXEC)     MOS23400
                         2341  *                                                                    MOS23410
                         2342  ************************************************************************MOS23420
                         2343  *       (R6)                                                         MOS23430
348A  2430               2344  MOVPRG    LIS   R3,0            INITIALIZE DATA PATTERN              MOS23440
348C  9D14               2345          SSR   R1,R4           EXERCISE BIT #3 IN INSTR. STREAM     MOS23450
                         2346  *                                                                    MOS23460
348E  4036 0000          2347  MOVPRG1   STH   R3,0(R6)        STORE PATRN AT LOW TEST LOC          MOS23470
3492  4846 0000          2348          LH    R4,0(R6)        LOAD FROM LOW LOC                    MOS23480
3496  0543               2349          CLAR  R4,R3           EQUAL ?                              MOS23490
3498  2134               2350          BNES  MOVPRG21        NO, ERROR                            MOS23500
349A  2731               2351  MOVPRG2   SIS   R3,1            YES, DECREMENT DATA PATTERN          MOS23510
349C  2037               2352          BNZS  MOVPRG1         REPEATE TILL DONE                    MOS23520
349E  2304               2353          BS    MOVPRG22                                             MOS23530
                         2354  *                                                                    MOS23540
34A0  41F0 3542          2355  MOVPRG21  BAL   LINK,ERROR      PRINT ERROR TTOD                     MOS23550
34A4  2205               2356          BS    MOVPRG2                                              MOS23560
                         2357  *                                                                    MOS23570
34A6  084B               2358  MOVPRG22  LDAR  R4,R11                                             MOS23580
34A8  0B46               2359          SAR   R4,R6                                                MOS23590
34AA  0542               2360          CLAR  R4,R2           IS TEST AREA LARGE ENOUGH ?          MOS23600
34AC  2188               2361          BLS   MOVPRG26        NO, BRANCH                           MOS23610
34AE  0A62               2362          AHR   R6,R2           YES, INCREMENT TEST CELL             MOS23620
34B0  4036 0000          2363  MOVPRG15  STH   R3,0(R6)        STORE PATRN AT HIGH TEST LOC         MOS23630
34B4  4846 0000          2364          LH    R4,0(R6)        LOAD FROM HIGH LOC                   MOS23640
34B8  0543               2365          CLAR  R4,R3           EQUAL ?                              MOS23650
34BA  2135               2366          BNES  MOVPRG27        NO, ERROR                            MOS23660
34BC  2731               2367  MOVPRG25  SIS   R3,1            YES, DECREMENT DATA PATTERN          MOS23670
34BE  2037               2368          BNZS  MOVPRG15        REPEAT TILL DONE                     MOS23680
34C0  0B62               2369          SAR   R6,R2           DECREMENT TEST CELL                  MOS23690
34C2  2304               2370  MOVPRG26  BS    MOVPRG28                                             MOS23700
                         2371  *                                                                    MOS23710
34C4  41F0 3542          2372  MOVPRG27  BAL   LINK,ERROR      PRINT ERROR TTOD                     MOS23720
34C8  2206               2373          BS    MOVPRG25                                             MOS23730
                         2374  *                                                                    MOS23740
34CA  0886               2375  MOVPRG28  LDAR  R8,R6                                              MOS23750
34CC  08C6               2376          LDAR  R12,R6          SAVE TEST LOCATION COUNTER           MOS23760
34CE  0835               2377          LDAR  R3,R5           GET BACKGROUND DATA PATTERN          MOS23770
34D0  C840 3045          2378          LHI   R4,C'0E'                                             MOS23780
34D4  4040 29E6          2379          STH   R4,ERRNO        ERRNO = C'0E'                        MOS23790
34D8  086A               2380          LDAR  R6,R10                                               MOS23800
34DA  C360 1FC0          2381          THI   R6,X'1FC0'      IS LOC < X'40' ?                     MOS23810
34DE  2133               2382          BNZS  MOVPRG29        NO, BRANCH                           MOS23820
34E0  C860 0040          2383          LHI   R6,X'40'        YES, FORCE LOC TO X'40'              MOS23830
34E4  0568               2384  MOVPRG29  CLAR  R6,R8           IS LOW BACKGROUND AREA PRESENT ?     MOS23840
34E6  233C               2385          BES   MOVPRG5         NO, BRANCH                           MOS23850
34E8  4846 0000          2386  MOVPRG3   LH    R4,0(R6)                                           MOS23860
34EC  0543               2387          CLAR  R4,R3           IS LOW BACKGROUND PATTERN OK ?       MOS23870
34EE  2135               2388          BNES  MOVPRG45                                             MOS23880
34F0  2662               2389  MOVPRG4   AIS   R6,2            INCREMENT LOW LOCATION COUNTER       MOS23890
34F2  0568               2390          CLAR  R6,R8           FINISHED LOW BACKGROUND TESTING ?    MOS23900
34F4  2086               2391          BLS   MOVPRG3                                              MOS23910
34F6  2304               2392          BS    MOVPRG5                                              MOS23920
```

TEST 8

```
                        2393  *                                                                    MOS23930
34F8  41F0 3542         2394  MOVPRG45 BAL   LINK,ERROR          PRINT ERROR TTOE                 MOS23940
34FC  2206              2395           BS    MOVPRG4                                              MOS23950
                        2396  *                                                                    MOS23960
34FE  0868              2397  MOVPRG5  LDAR  R6,R8               RESTORE LOC COUNTER              MOS23970
3500  0A62              2398           AHR   R6,R2                                                MOS23980
3502  2662              2399           AIS   R6,2                                                 MOS23990
3504  056B              2400  MOVPRG6  CLAR  R6,R11              LOC > HILIM ?                    MOS24000
3506  238B              2401           BNLS  MOVPRG8              YES, DONE                        MOS24010
3508  4846 0000         2402           LH    R4,0(R6)                                             MOS24020
350C  0543              2403           CLAR  R4,R3                NO, IS HI BACKGROUND PATTERN OK ? MOS24030
350E  2134              2404           BNES  MOVPRG75                                             MOS24040
3510  2662              2405  MOVPRG7  AIS   R6,2                 INCREMENT HI LOC                 MOS24050
3512  2037              2406           BNZS  MOVPRG6              CONTINUE (BRANCH)                MOS24060
3514  2304              2407           BS    MOVPRG8                                              MOS24070
                        2408  *                                                                    MOS24080
3516  41F0 3542         2409  MOVPRG75 BAL   LINK,ERROR          PRINT ERROR TTOE                 MOS24090
351A  2205              2410           BS    MOVPRG7                                              MOS24100
                        2411  *                                                                    MOS24110
351C  C86C 0002         2412  MOVPRG8  LHI   R6,2(R12)           INCREMENT LOCATION COUNTER       MOS24120
3520  030E              2413           BR    R14                RETURN                           MOS24130
      0000 3522         2414  ENDMOV8  EQU   *                  (R6)+164                         MOS24140
                        2415  *                                                                    MOS24150
                        2416  ************************************************************************MOS24160
                        2417  *                                                                    MOS24170
3522  C850 36F2         2418  T8LOPRT  LHI   R5,T8LOMSG          UNCONDITIONALLY PRINT ERROR MESSAGE MOS24180
3526  4050 299C         2419           STH   R5,ISITERR                                            MOS24190
352A  41F0 2652         2420           BAL   LINK,PRINT           "HILIM - LOLIM IS < REQUIRED"    MOS24200
352E  4300 20BE         2421           B     OPTIN                ABORT TESTING SEQUENCE           MOS24210
                        2422  *                                                                    MOS24220
                        2423  ************************************************************************MOS24230
                        2424  *        END   TEST 8                                                MOS24240
```

COMMON ERROR ROUTINE

```
3532  4040 200C          2426  PARERR   STH   R4,TEMP          SET UP TO PRINT PARITY ERROR     ***  MOS24260
3536  C840 3132          2427           LHI   R4,C'12'         *                                ***  MOS24270
353A  4040 29E6          2428           STH   R4,ERRNO         ERRNO = C'12'                    ***  MOS24280
353E  4840 200C          2429           LH    R4,TEMP          *                                ***  MOS24290
                         2430  *                                                                    MOS24300
                         2431  *  COMMON ERROR ROUTINE         CALL:  BAL   LINK,ERROR               MOS24310
                         2432  *                                                                    MOS24320
                         2433  *   R6= LOCATION OF ERROR    R3= DATA EXPECTED     R4= DATA READ    MOS24330
                         2434  *                                                                    MOS24340
3542  D000 3720          2435  ERROR    STM   R0,MOSSAVE        SAVE CALLING REGISTERS           MOS24350
3546  41F0 24FE          2436           BAL   LINK,ERR         PRINT THE ERROR NUMBER           MOS24360
354A  25F1               2437           LCS   LINK,1                                            MOS24370
354C  40F0 299E          2438           STH   LINK,NOERR       SET ERROR FLAG FOR EXEC.         MOS24380
3550  48F0 2A60          2439           LH    LINK,SCOPE+6                                      MOS24390
3554  27F1               2440           SIS   LINK,1           IS SCOPE = 1 ?                   MOS24400
3556  4330 35C6          2441           BZ    PARTNO           YES, PRINT PART NUMBER.          MOS24410
355A  27F3               2442           SIS   LINK,3           IS SCOPE = 4 ?                   MOS24420
355C  4330 35B2          2443           BZ    ERORTN2          YES, RETURN                      MOS24430
3560  27F1               2444           SIS   LINK,1           IS SCOPE = 5 ?                   MOS24440
3562  4330 35C6          2445           BZ    PARTNO           YES, PRINT PART NO. & CONTINUE   MOS24450
3566  2404               2446  ERROR1   LIS   R0,4                                             MOS24460
3568  0816               2447           LDAR  R1,R6                                             MOS24470
356A  C820 3682          2448           LDAI  R2,ADRMSG                                         MOS24480
356E  41F0 25F2          2449           BAL   LINK,HEXASC      STORE LOCATION UNDER TEST        MOS24490
3572  0813               2450           LDAR  R1,R3                                             MOS24500
3574  C820 3690          2451           LDAI  R2,DTAEXP                                         MOS24510
3578  41F0 25F2          2452           BAL   LINK,HEXASC      STORE DATA EXPECTED              MOS24520
357C  0814               2453           LDAR  R1,R4                                             MOS24530
357E  C820 36A0          2454           LDAI  R2,DTARED                                         MOS24540
3582  41F0 25F2          2455           BAL   LINK,HEXASC      STORE DATA READ                  MOS24550
3586  C850 367E          2456  ERROR2   LDAI  R5,ERRORMSG                                       MOS24560
358A  4050 299C          2457           STH   R5,ISITERR       SET ISITERR                      MOS24570
358E  41F0 2652          2458           BAL   LINK,PRINT       PRINT THE ERROR DATA             MOS24580
3592  2450               2459           LIS   R5,0                                              MOS24590
3594  4050 299C          2460           STH   R5,ISITERR       RESET ISITERR                    MOS24600
                         2461  *                                                                 MOS24610
3598  48F0 2A60          2462  ERORTN   LH    LINK,SCOPE+6                                      MOS24620
359C  4330 23A4          2463           BZ    TSTEND           IF SCOPE = 0                     MOS24630
35A0  27F1               2464           SIS   LINK,1           OR SCOPE = 1,                    MOS24640
35A2  4330 23A4          2465           BZ    TSTEND           GO TO NEXT TEST                  MOS24650
35A6  27F2               2466           SIS   LINK,2           IS SCOPE = 3 ?                   MOS24660
35A8  4330 2426          2467           BZ    ABORT1           YES, ABORT TESTING SEQUENCE      MOS24670
35AC  D100 3720          2468  ERORTN1  LM    R0,MOSSAVE       NO, RESTORE CALLING REGISTERS AND MOS24680
35B0  030F               2469           BR    LINK             RETURN                           MOS24690
                         2470  *                                                                 MOS24700
35B2  48F0 29A8          2471  ERORTN2  LH    LINK,TOTERR      IF SCOPE = 4                     MOS24710
35B6  26F1               2472           AIS   LINK,1           INDEX THE ERROR COUNTER          MOS24720
35B8  40F0 29A8          2473           STH   LINK,TOTERR                                       MOS24730
35BC  C5F0 7FFF          2474           CLAI  LINK,X'7FFF'     TOTERR = MAXIMUM ?               MOS24740
35C0  203A               2475           BNES  ERORTN1          NO, RETURN                       MOS24750
35C2  4300 2490          2476           B     HALT9            YES, WAIT FOR PRINTOUT           MOS24760
```

COMMON ERROR ROUTINE

```
35C6  C850 4130          2478  PARTNO  LDAI  R5,C'A0'          LOAD AND                                MOS24780
35CA  4050 3678          2479          STH   R5,CHIPNO         STORE DRIVE & CHIP ROW NUMBER           MOS24790
35CE  0734               2480          XAR   R3,R4             DETERMINE BIT(S) THAT FAILED            MOS24800
35D0  2410               2481          LIS   R1,0              INITIALIZE CHIP NUMBER                  MOS24810
35D2  C530 FFFF          2482          CLAI  R3,-1             DID ALL BITS FAIL ?                     MOS24820
35D6  2137               2483          BNES  CO3               NO, BRANCH                              MOS24830
35D8  C840 4646          2484          LDAI  R4,C'FF'                                                  MOS24840
35DC  4040 367A          2485          STH   R4,CHIPNO+2       YES, STORE 8KB ROW IDENTIFIER           MOS24850
35E0  2430               2486          LIS   R3,0                                                      MOS24860
35E2  230C               2487          BS    CO5               CONTINUE                                MOS24870
35E4  9131               2488  CO3     SLHLS R3,1              DECIPHER FAILING BIT NUMBER(S)          MOS24880
35E6  2185               2489          BCS   CO4               (00-09,10-16)                           MOS24890
35E8  2611               2490          AIS   R1,1                                                      MOS24900
35EA  C510 0010          2491          CLHI  R1,16             CHIP NUMBER = 16 ?                      MOS24910
35EE  2085               2492          BLS   CO3               NO, BRANCH                              MOS24920
35F0  2402               2493  CO4     LIS   R0,2                                                      MOS24930
35F2  C820 367A          2494          LDAI  R2,CHIPNO+2       CONVERT TO DECIMAL AND                  MOS24940
35F6  41F0 261A          2495          BAL   LINK,DECASC       STORE IN ERROR MESSAGE                  MOS24950
35FA  C850 365E          2496  CO5     LDAI  R5,CHIPMSG                                                MOS24960
35FE  4050 299C          2497          STH   R5,ISITERR        SET ISITERR                             MOS24970
3602  41F0 2652          2498          BAL   LINK,PRINT        PRINT SUSPECTED CHIP NUMBER             MOS24980
3606  2450               2499          LIS   R5,0                                                      MOS24990
3608  4050 299C          2500          STH   R5,ISITERR        RESET ISITERR                           MOS25000
360C  0833               2501          LDAR  R3,R3             HAVE ALL SUSPECT CHIPS BEEN PRINTED?    MOS25010
360E  4230 35E4          2502          BNZ   CO3               NO, BRANCH                              MOS25020
3612  D100 3720          2503          LM    R0,MOSSAVE        YES, RESTORE REGISTERS AND              MOS25030
3616  4300 3566          2504          B     ERROR1            GO PRINT ERROR DATA                     MOS25040
                         2505  *                                                                       MOS25050
                         2506  ************************************************************************ MOS25060
                         2507  *       END   COMMON ERROR ROUTINE                                      MOS25070
```

```
                                2509  *                                                                    MOS25090
                                2510  *        TEST MESSAGES                                               MOS25100
                                2511  *                                                                    MOS25110
361A  4153 5349 474E 4544       2512  ASMEMMSG DC    C'ASSIGNED MEMORY ',X'0D0A'                          MOS25120
3622  204D 454D 4F52 5920
362A  0D0A
362C  4C4F 4C49 4D20 3E20       2513  HILOMSG  DC    C'LOLIM > HILIM IS ILLEGAL',X'0D0A'                  MOS25130
3634  4849 4C49 4D20 4953
363C  2049 4C4C 4547 414C
3644  0D0A
3646  4D45 4D4F 5259 2046       2514  AVMEMMSG DC    C'MEMORY FOUND BY SEARCH',X'0D0A'                    MOS25140
364E  4F55 4E44 2042 5920
3656  5345 4152 4348
365C  0D0A
365E  5355 5350 4543 5445       2515  CHIPMSG  DC    C'SUSPECTED BAD CHIP NUMBER '                        MOS25150
3666  4420 4241 4420 4348
366E  4950 204E 554D 4245
3676  5220
3678  4130 2A2A                 2516  CHIPNO   DC    C'A0**',X'0D0A'                                      MOS25160
367C  0D0A
367E  4C4F 4320                 2517  ERRORMSG DC    C'LOC '                                              MOS25170
                                2518  *                                                                    MOS25180
3682  2A2A 2A2A 2044 4154       2519  ADRMSG   DC    C'**** DATA EXP '                                    MOS25190
368A  4120 4558 5020
3690  2A2A 2A2A 2020 4441       2520  DTAEXP   DC    C'****  DATA READ '                                  MOS25200
3698  5441 2052 4541 4420
36A0  2A2A 2A2A                 2521  DTARED   DC    C'****',X'0D0A'                                      MOS25210
36A4  0D0A
36A6  4D45 4D4F 5259 2055       2522  T6MSG    DC    C'MEMORY UNDER GALPAT TEST',X'0D0A'                  MOS25220
36AE  4E44 4552 2047 414C
36B6  5041 5420 5445 5354
36BE  0D0A
36C0  3030 3030 2D31 4646       2523  LOMSG    DC    C'0000-1FFF ',X'0D0A'                                MOS25230
36C8  4620
36CA  0D0A
      0000 36C5                 2524  HIMSG    EQU   LOMSG+5                                              MOS25240
                                2525  *                                                                    MOS25250
36CC  504F 5745 5220 444F       2526  T7MSG    DC    C'POWER DOWN PROCESSOR FOR 30 SECONDS ',X'0D0A'      MOS25260
36D4  574E 2050 524F 4345
36DC  5353 4F52 2046 4F52
36E4  2033 3020 5345 434F
36EC  4E44 5320
36F0  0D0A
36F2  4849 4C49 4D20 2D20       2527  T8LOMSG  DC    C'HILIM - LOLIM IS < REQUIRED ',X'0D0A'              MOS25270
36FA  4C4F 4C49 4D20 4953
3702  203C 2052 4551 5549
370A  5245 4420
370E  0D0A
                                2528  *                                                                    MOS25280
                                2529  ********************************************************************  MOS25290
                                2530  *        END   TEST MESSAGE FILE                                     MOS25300
      0000 370F                 2531  LNZB     EQU   *-1                                                   MOS25310
```

CHKSUM FILE

```
                    2533  *                                                                    MOS25330
                    2534  *        TEST PROGRAM STORAGE AREA                                   MOS25340
                    2535  *                                                                    MOS25350
                    2536  ************************************************************************MOS25360
                    2537  *                                                                    MOS25370
3710                2538  OPTBUF   DS    6                  OPTION INPUT BUFFER               MOS25380
3716                2539  VLOLIM   DS    2                  VIRTUAL LOW LIMIT                 MOS25390
3718                2540  VHILIM   DS    2                  VIRTUAL HIGH LIMIT                MOS25400
                    2541  *                                                                    MOS25410
                    2542  ************************************************************************MOS25420
                    2543  *                                                                    MOS25430
3720                2544           ALIGN 8                                                     MOS25440
                    2545  *                                                                    MOS25450
3720                2546  MOSSAVE  DS    64                 S16MMT REGISTER SAVE AREA         MOS25460
3760                2547  PSWSAVE  DS    4                  PPF PSW SAVE AREA                 MOS25470
3764                2548  RSAVE    DS    64                 REGISTER SAVE AREA                MOS25480
37A4                2549  ERRSAVE  DS    32                 REG STORAGE FOR ERROR ROUTINES    MOS25490
                    2550  *                                                                    MOS25500
                    2551  ************************************************************************MOS25510
                    2552  *                                                                    MOS25520
                    2553  *        END   TEST PROGRAM 06-204F02R01 PART 2 SECTION 2        ***  MOS25530
```

CHKSUM/M17 PUNCHER

```
37C4  2400            2555  $CHKSUM  LIS   R0,0          PUNCH M17 TAPE WITH CHECKSUM          MOS25550
37C6  9510            2556           EPSR  R1,R0         SELECT REG. SET 0 & CLEAR PSW         MOS25560
                      2557  *                                                                   MOS25570
37C8  C810 2000       2558           LDAI  R1,ORIGIN1     LOAD START ADDRESS                    MOS25580
37CC  2421            2559           LIS   R2,1           LOAD INCREMENT VALUE                  MOS25590
37CE  C830 370F       2560           LDAI  R3,LNZB        LOAD FINAL ADDRESS                    MOS25600
37D2  2440            2561           LIS   R4,0           INITIALIZE CHKSUM BYTE                MOS25610
                      2562  *                                                                   MOS25620
37D4  D351 0000       2563  $GEN     LB    R5,0(R1)                                            MOS25630
37D8  0745            2564           XAR   R4,R5          CALCULATE CHKSUM BYTE                 MOS25640
37DA  C110 37D4       2565           BXLE  R1,$GEN                                             MOS25650
37DE  D240 0099       2566           STB   R4,MN+3        CHECKSUM BYTE TO BOOT LOADER          MOS25660
                      2567  *                                                                   MOS25670
37E2  C810 0080       2568  $TAPE    LHI   R1,X'0080'                                          MOS25680
37E6  9E21            2569           OCR   R2,R1          DISPLAY IN NORMAL MODE                MOS25690
37E8  9444            2570           EXBR  R4,R4                                               MOS25700
37EA  9824            2571           WHR   R2,R4          DISPLAY CHKSUM BYTE (TO D1)           MOS25710
37EC  9411            2572           EXBR  R1,R1                                               MOS25720
37EE  9501            2573           EPSR  R0,R1          HALT PROCESSOR                        MOS25730
                      2574  *                                                                   MOS25740
                      2575  ************************************************************************MOS25750
                      2576  *                                                                   MOS25760
37F0  D360 007A       2577  $PUNCH   LB    R6,X'7A'       GET BOUTDV (PUNCH) ADDRESS.           MOS25770
37F4  DE60 007B       2578           OC    R6,X'7B'       START TAPE PUNCH                      MOS25780
37F8  9D60            2579           SSR   R6,R0                                               MOS25790
37FA  2081            2580           BTBS  8,1                                                 MOS25800
37FC  41F0 383E       2581           BAL   R15,$TAPL      PUNCH LEADER                          MOS25810
3800  9411            2582           EXBR  R1,R1          (R1) = X'0080'                        MOS25820
3802  C830 00CF       2583           LHI   R3,X'CF'                                            MOS25830
                      2584  *                                                                   MOS25840
3806  DA61 0000       2585  $PNCH1   WD    R6,0(R1)       PUNCH BOOT LOADER                     MOS25850
380A  9D60            2586           SSR   R6,R0                                               MOS25860
380C  2081            2587           BTBS  8,1                                                 MOS25870
380E  C110 3806       2588           BXLE  R1,$PNCH1                                           MOS25880
3812  41F0 3844       2589           BAL   R15,$TAPL1     PUNCH ONE-FOLD GAP.                   MOS25890
                      2590  *                                                                   MOS25900
3816  D340 0099       2591           LB    R4,MN+3        GET CHECKSUM BYTE                     MOS25910
381A  C810 2000       2592           LDAI  R1,ORIGIN1     (NORMALLY X'A00')                     MOS25920
381E  C830 370F       2593           LDAI  R3,LNZB                                             MOS25930
                      2594  *                                                                   MOS25940
3822  D351 0000       2595  $PNCH2   LB    R5,0(R1)       PUNCH PROGRAM                         MOS25950
3826  0745            2596           XAR   R4,R5                                               MOS25960
3828  9A65            2597           WDR   R6,R5                                               MOS25970
382A  9401            2598           EXBR  R0,R1                                               MOS25980
382C  9820            2599           WHR   R2,R0          DATA ADDRESS TO DISPLAY.              MOS25990
382E  9D60            2600           SSR   R6,R0                                               MOS26000
3830  2081            2601           BTBS  8,1                                                 MOS26010
3832  C110 3822       2602           BXLE  R1,$PNCH2                                           MOS26020
3836  41F0 383E       2603           BAL   R15,$TAPL      PUNCH TRAILER.                        MOS26030
383A  4300 37E2       2604           B     $TAPE          DISPLAY CHECKSUM, HALT PROCESSOR.     MOS26040
```

```
                        2606  * $CHKSUM/M17 PUNCHER (CONTINUED)                                    MOS26060
                        2607  *                                                                    MOS26070
                        2608  *                                                                    MOS26080
 383E   C800 0100       2609  $TAPL     LHI   R0,256            TO PUNCH BLANK LEADER             MOS26090
 3842   2303            2610            BS    $TAPLP                                             MOS26100
                        2611  *                                                                    MOS26110
 3844   C800 0080       2612  $TAPL1    LHI   R0,128            TO PUNCH 1-FOLD GAP               MOS26120
                        2613  *                                                                    MOS26130
 3848   2701            2614  $TAPLP    SIS   R0,1                                                MOS26140
 384A   032F            2615            BNPR  R15               RETURN                            MOS26150
 384C   2430            2616            LIS   R3,0                                                MOS26160
 384E   9A63            2617            WDR   R6,R3             PUNCH BLANK FRAME                 MOS26170
 3850   9D68            2618            SSR   R6,R8                                               MOS26180
 3852   2081            2619            BTBS  8,1                                                 MOS26190
 3854   2206            2620            BS    $TAPLP            CONTINUE.                         MOS26200
                        2621  *                                                                    MOS26210
                        2622  ************************************************************************MOS26220
 3856                   2623            END                                                       MOS26230
```

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

START OPTIONS: T=16,CROSS,ERLST,

NO CAL ERRORS
NO CAL WARNINGS
2 PASSES

$CHKSUM	0000	37C4	2555*												
$DEC1	0000	2624	709*	723											
$DEC2	0000	262A	711*	716	718										
$DEC3	0000	263C	712	719*											
$GEN	0000	37D4	2563*	2565											
$PNCH1	0000	3806	2585*	2588											
$PNCH2	0000	3822	2595*	2602											
$PUNCH	0000	37F0	2577*												
$TAPE	0000	37E2	2568*	2604											
$TAPL	0000	383E	2581	2603	2609*										
$TAPL1	0000	3844	2589	2612*											
$TAPLP	0000	3848	2610	2614*	2620										
$TSTDU0	0000	284E	911	913*											
$TSTDU1	0000	286C	923*												
$TSTDU2	0000	286E	920	922	924*										
ABORT	0000	23E4	485*												
ABORT1	0000	2426	504*	897	2467										
ABORT2	0000	2464	527*												
ABORT3	0000	242E	497	507*											
ABSTOP	0000	3856													
ADC	0000	0002	708	722											
ADRMSG	0000	3682	2448	2519*											
AMSG	0000	2A28	202	1105*											
ASCILOC	0000	2A12	627	1102*											
ASCIPSW	0000	2A08	624	1100*											
ASMEMMSG	0000	361A	1231	2512*											
AVMEMMSG	0000	3646	1234	2514*											
BGTST	0000	3044	1834*												
BGTST1	0000	305E	1844*	1849											
BGTST2	0000	306C	1845	1849*	1853										
BGTST2.5	0000	3072	1848	1852*											
BGTST3	0000	3078	1843	1850	1855*										
BGTST4	0000	3084	1861*	1866											
BGTST5	0000	3092	1862	1866*	1870										
BGTST5.5	0000	3098	1865	1869*											
BGTST6	0000	309E	1860	1867	1872*										
BGTST7	0000	30A6	1819	1874*											
BOOT	0000	0088	77	80*											
BRK.SAV	0000	29B6	867	900	904	1083*									
BRKVECT	0000	299A	898	902	1068*	1306	1328	1421	1455	1530	1560	1647	1697	1816	2069
			2171	2227	2313										
BTESTNO	0000	29AA	426	439	456	479	535	1076*							
C300ADR	0000	2018	127*												
CAR2ND	0000	2990	1057*												
CARRD	0000	2984	1049*												
CARRQ2S	0000	2998	1064*												
CHIPMSG	0000	365E	2496	2515*											

```
CHIPNO    0000 3678    2479   2485   2494   2516*
CHKCOL    0000 2E4C    1616   1619   1622   1628*
CHKCOL1   0000 2E56    1632*  1639
CHKCOL2   0000 2E66    1636   1638*
CHKCOL25  0000 2E6A    1633   1639*
CHKCOL3   0000 2E72    1642*  1682
CHKCOL4   0000 2E9C    1653   1655*
CHKCOL5   0000 2EA8    1657   1659*
CHKCOL6   0000 2EC0    1664   1666*
CHKCOL7   0000 2EDC    1672   1674*
CHKCOL8   0000 2EF8    1650   1680   1682*
CHKCOL9   0000 2F0A    1688*  1727
CHKCOLA   0000 2F14    1690   1692*
CHKCOLB   0000 2F40    1703   1705*
CHKCOLC   0000 2F58    1710   1712*
CHKCOLD   0000 2F74    1718   1720*
CHKCOLE   0000 2F8C    1700   1725   1727*
CHKLOC    0000 2C8C    1378   1382   1385   1389   1392   1396   1402*
CHKLOC1   0000 2C96    1406*  1413
CHKLOC10  0000 2D60    1458   1468   1470*
CHKLOC2   0000 2CA6    1410   1412*
CHKLOC25  0000 2CAA    1407   1413*
CHKLOC3   0000 2CB2    1416*  1440
CHKLOC4   0000 2CDC    1427   1429*
CHKLOC5   0000 2CE8    1431   1433*
CHKLOC6   0000 2D00    1424   1438   1440*
CHKLOC7   0000 2D12    1446*  1470
CHKLOC8   0000 2D1C    1448   1450*
CHKLOC9   0000 2D48    1461   1463*
CKBG60    0000 323C    2071*
CKBG61    0000 3250    2078*  2087
CKBG62    0000 3262    2082   2084*
CKBG63    0000 326A    2079   2087*  2091
CKBG64    0000 3270    2086   2090*
CKBG65    0000 3276    2088   2093*
CLIF2ND   0000 298C    1055*
CLIFADR   0000 2014     125*
CLIFRD    0000 2980    1047*
CO3       0000 35E4    2483   2488*  2492   2502
CO4       0000 35F0    2489   2493*
CO5       0000 35FA    2487   2496*
COMM      0000 28E6     978*   995
COMM1     0000 28EE     980*  1026
COMRET    0000 29B2     594    601   1081*
CON2ND    0000 2988     163    172    173   1052*  1053
CONADR    0000 297A     169    846    868    938   1042*
CONENRD   0000 2989    1053*
CONRD     0000 297C     170    171    183    843    939   1044*  1045
CONRQ2S   0000 2994     157    175    176    944   1060*
CONTIN    0000 2A42     496    896   1116*
CONWRT    0000 297D     953   1045*
COUNT     0000 29AC     453    468    470   1077*
CRLF      0000 26DA     190    198    272    314    340    392    409    549    781*   855
CRT2ND    0000 298A    1054*
CRTRD     0000 297E    1046*
```

```
NOERMSG   0000 29FA    477   1098*
NOERR     0000 299E    452    475    600   1070*  2438
NOMSG     0000 2A4E    516    753   1117*
NORM      0000 200E    119*   577   1142
OLOC      0000 2972    626    979   1017   1033*
OPSW      0000 2970    623    978   1016   1032*
OPT       0000 2A2A    239    274    316   1113*
OPTBUF    0000 3710    208    209    210    225    233    244   2538*
OPTCMD    0000 21A6    273*
OPTCMD1   0000 21A8    274*   278
OPTCMD10  0000 2230    318*   322
OPTCMD11  0000 2262    335*   339
OPTCMD12  0000 2270    330    333    340*
OPTCMD2   0000 21CA    284*   310
OPTCMD3   0000 21D0    286*   305
OPTCMD4   0000 21D6    288*
OPTCMD5   0000 21E8    290    293*
OPTCMD6   0000 21F8    295    298*
OPTCMD7   0000 2204    287    301*
OPTCMD71  0000 2216    306*
OPTCMD8   0000 2224    271    314*
OPTCMD9   0000 222E    317*   344
OPTEND    0000 2A96   1130*
OPTEND2   0000 2A96    343   1129*  1130
OPTEXX    0000 2194    260    263    267*
OPTIN     0000 20BE    196*   217    337    361    376    389    521    564    899   1176   2421
OPTIN1    0000 20CA    199*   345    861    985
OPTION    0000 2A96    255    267   1132*
OPTRTN    0000 219A    270*
OPTVAL    0000 257E    261    353    381    635*
OPTVAL0   0000 2584    637*   655
OPTVAL1   0000 2586    638*   641
OPTVAL2   0000 2592    639    643*
OPTVAL3   0000 2596    645*   651
OPTVAL4   0000 25AA    649    652*
OPTVAL5   0000 25A6    647    650*
ORIGIN1   0000 2000     80    109*  2558   2592
OTC.0     0000 26FA    792*   797    806    808
OTC.1     0000 2710    795    799*
OTC.3     0000 2722    802    805*
OTC.4     0000 2740    814*   819
OTC.5     0000 2756    821*   827
OUT.SAV   0000 29B4    787    830   1082*
OUT0      0000 276C    793    812    815    817    822    829*
OUT1      0000 2770    828    830*
OUTCHR    0000 26E8    203    205    265    275    280    292    297    300    319    324    558    679    749
                       759    768    772    783    787*
OUTCHR2   0000 2730    790    798    804    810*
P1        0000 2668    731    735*
P2        0000 268E    749*   751
P3        0000 269A    736    753*
P4        0000 2674    738*   742
P5        0000 2678    739*   740
PARERR    0000 3532   1005   2426*
PARTNO    0000 35C6   2441   2445   2478*
```

		2380												
R11	0000 000B	65*	1376	1381	1388	1395	1411	1428	1446	1614	1637	1654	1688	1781
		1882	1883	1889	1890	1903	1973	1978	1985	1992	2008	2024	2040	2058
		2083	2145	2152	2207	2271	2336	2358	2400					
R12	0000 000C	66*	206	223	232	243	352	355	366	383	402	642	1418	1419
		1452	1453	1534	1536	1542	1644	1645	1694	1695	1812	1839	1855	1893
		1971	2051	2065	2146	2153	2213	2376	2412					
R13	0000 000D	67*	1144	1146	1148	1150	1169	1377	1384	1391	1409	1426	1447	1526
		1543	1556	1572	1615	1618	1621	1635	1652	1689	1830	1895	1910	1912
		1974	1981	1988	2006	2025	2038	2056	2081	2147	2154	2219		
R14	0000 000E	68*	261	271	307	353	356	358	381	384	653	656	662	978
		993	1012	1014	1015	1016	1137	1138	1139	1140	1152	1378	1382	1385
		1389	1392	1396	1472	1616	1619	1622	1729	1795	1806	1826	1827	1875
		1975	1979	1982	1986	1989	1993	2097	2165	2173	2179	2180	2181	2182
		2186	2187	2190	2229	2317	2413							
R15	0000 000F	70*	184	192	212	358	367	393	394	395	513	514	636	637
		638	640	644	645	679	787	898	900	979	994	1013	1017	1813
		1814	2022	2023	2310	2311	2581	2589	2603	2615				
R2	0000 0002	56*	76	96	102	140	142	147	152	154	156	157	161	162
		163	170	171	172	173	181	181	182	199	200	267	268	273
		274	276	277	283	286	308	316	318	320	325	342	343	431
		434	437	439	440	441	442	444	446	447	456	457	458	541
		583	587	588	594	599	600	601	602	624	627	671	672	674
		676	680	695	696	720	721	735	875	876	878	883	887	890
		890	960	981	989	990	991	992	1000	1001	1010	1011	1022	1162
		1163	1246	1249	1783	1787	1799	1802	1822	1823	1824	1825	1837	1873
		1958	1962	1969	2050	2064	2166	2168	2279	2293	2294	2295	2296	2297
		2298	2299	2300	2301	2302	2308	2321	2322	2323	2324	2325	2326	2327
		2328	2329	2330	2337	2360	2362	2369	2398	2448	2451	2454	2494	2559
		2569	2571	2599										
R3	0000 0003	57*	81	82	83	148	149	152	168	169	178	178	182	183
		184	240	244	248	250	270	283	308	317	321	385	556	559
		660	663	663	688	689	690	692	697	706	707	708	710	722
		748	750	961	965	966	1143	1145	1147	1149	1159	1165	1293	1297
		1311	1316	1320	1408	1411	1412	1425	1428	1430	1433	1434	1437	1446
		1449	1460	1463	1464	1467	1516	1520	1535	1536	1537	1539	1547	1551
		1564	1566	1568	1571	1634	1637	1638	1651	1654	1656	1659	1660	1663
		1666	1667	1671	1674	1675	1679	1688	1691	1702	1705	1706	1709	1712
		1713	1717	1720	1721	1724	1837	1847	1864	1900	1903	2005	2008	2009
		2024	2027	2028	2032	2034	2037	2040	2042	2044	2055	2058	2059	2080
		2083	2085	2202	2204	2207	2210	2213	2216	2219	2222	2344	2347	2349
		2351	2363	2365	2367	2377	2387	2403	2450	2480	2482	2486	2488	2501
		2501	2560	2583	2593	2616	2617							
R4	0000 0004	58*	85	86	87	89	97	99	175	176	177	179	179	202
		204	213	215	216	218	220	227	229	233	259	264	274	279
		284	285	288	291	296	298	299	299	301	302	303	304	318
		323	336	338	351	354	372	386	557	638	646	648	652	654
		675	676	677	678	678	691	692	693	694	694	695	709	714
		715	717	719	719	720	744	745	746	747	758	760	764	769
		771	782	820	835	837	839	849	850	945	967	968	969	973
		1164	1165	1299	1300	1310	1311	1332	1373	1374	1416	1417	1429	1430
		1436	1437	1450	1451	1459	1460	1466	1467	1514	1515	1523	1524	1538
		1539	1567	1568	1642	1643	1655	1656	1662	1663	1668	1669	1670	1671
		1676	1677	1678	1679	1692	1693	1701	1702	1708	1709	1714	1715	1716
		1717	1723	1724	1835	1836	1846	1847	1863	1864	1905	1906	1907	2029

			2030	2031	2032	2041	2042	2075	2076	2084	2085	2182	2188	2189	2191
			2192	2203	2204	2209	2210	2215	2216	2221	2222	2306	2307	2315	2316
			2345	2348	2349	2358	2359	2360	2364	2365	2378	2379	2386	2387	2402
			2403	2426	2427	2428	2429	2453	2480	2484	2485	2561	2564	2566	2570
			2570	2571	2591	2596									
R5	0000	0005	59*	87	89	90	90	92	93	94	97	99	105	191	242
			244	281	282	294	294	306	306	309	325	378	382	449	477
			510	511	550	551	554	562	615	629	675	710	711	713	758
			762	857	1173	1174	1231	1234	1252	1782	1790	1792	1840	1856	1885
			1892	1911	1964	1966	2156	2157	2160	2161	2163	2164	2277	2283	2335
			2377	2418	2419	2456	2457	2459	2460	2478	2479	2496	2497	2499	2500
			2563	2564	2595	2596	2597								
R5HEX	0000	25C8	327	555	563	670*									
R5X	0000	25D6	675*	681											
R5XA	0000	25E4	679*												
R5XB	0000	25EC	673	682*											
R6	0000	0006	60*	84	94	101	157	158	159	159	241	242	249	262	266
			315	331	332	334	360	365	382	635	643	644	650	661	664
			1156	1159	1160	1161	1162	1164	1168	1235	1236	1241	1242	1245	1289
			1295	1297	1298	1301	1303	1308	1310	1314	1315	1318	1320	1321	1323
			1325	1330	1332	1335	1402	1406	1409	1412	1413	1414	1418	1423	1426
			1429	1434	1436	1440	1441	1442	1447	1452	1457	1459	1464	1466	1470
			1511	1518	1520	1521	1522	1527	1532	1537	1538	1545	1546	1549	1551
			1552	1553	1557	1562	1566	1567	1574	1628	1632	1635	1638	1639	1640
			1644	1649	1652	1655	1660	1662	1667	1670	1675	1678	1682	1683	1684
			1689	1694	1699	1701	1706	1708	1713	1716	1721	1723	1727	1774	1776
			1785	1787	1788	1789	1797	1800	1802	1803	1804	1813	1818	1821	1829
			1830	1838	1839	1841	1842	1844	1846	1849	1855	1856	1857	1859	1861
			1863	1866	1873	1874	1879	1880	1882	1883	1885	1886	1887	1889	1890
			1892	1894	1907	1909	1911	1999	2003	2006	2009	2010	2021	2022	2025
			2028	2031	2034	2035	2038	2041	2044	2046	2047	2048	2054	2056	2059
			2060	2061	2062	2072	2078	2081	2084	2087	2139	2149	2151	2152	2153
			2154	2155	2195	2198	2200	2203	2208	2209	2214	2215	2220	2221	2225
			2268	2270	2273	2280	2282	2283	2284	2285	2286	2288	2292	2310	2317
			2320	2335	2338	2347	2348	2359	2362	2363	2364	2369	2375	2376	2380
			2381	2383	2384	2386	2389	2390	2397	2398	2399	2400	2402	2405	2412
			2447	2577	2578	2579	2585	2586	2597	2600	2617	2618			
R7	0000	0007	61*	103	104	105	379	385	388	1157	1291	1404	1444	1513	1630
			1686	1778	2001	2014	2017	2019	2035	2046	2050	2051	2074	2142	2193
			2272	2273	2274	2278									
R8	0000	0008	62*	95	96	101	102	380	1158	1232	1237	1238	1239	1242	1248
			1290	1403	1443	1512	1629	1685	1775	1777	1790	1792	1794	1798	1805
			1838	1840	1842	1858	1859	2000	2013	2015	2019	2021	2054	2060	2064
			2065	2073	2140	2141	2269	2271	2272	2308	2336	2337	2338	2375	2384
			2390	2397	2618										
R9	0000	0009	63*	836	843	844	846	847	849	941	1777	1798	1858	1970	2047
			2048	2061	2062										
RDCHAR0	0000	2106	214	216*											
RDCHAR1	0000	211A	219	222*											
RDCHR	0000	20F8	212*	226	235										
RDCHR1	0000	212A	221	227*											
READ10	0000	2C26	1325*	1335											
READ11	0000	2BE4	1303*	1314											
RET	0000	000E	69*	584	618	631	984								
RSAVE	0000	3764	79	670	682	687	699	705	724	729	774	781	866	903	969

```
                        2548*
RTN10       0000 2C46   1331   1333   1335*
RTN11       0000 2C06   1309   1312   1314*
RUN         0000 2AA2    253   1133*
RUNIT       0000 22E6    254    392*
SCOPE       0000 2A5A    518   1118*  2439   2462
SELTST      0000 29A0    403    480    536   1071*
SET.RTN     0000 29B8    949    954   1084*
SETKB       0000 2878    165    201    509    930*
SETUP       0000 28A2    813    949*
SFTSET      0000 2FFE   1795   1806   1812*  1874
SINK        0000 2974    847    916    924    940   1035*
ST          0000 2022    140*
START       0000 2032    140    146*
START2      0000 201E    109    139*
STLOOP      0000 30AC   1782   1822   1824   1826   1879*
STORE10     0000 2C10   1318*  1321
STORE11     0000 2BCA   1295*  1298
STORE30     0000 2DDA   1549*  1552
STORE31     0000 2D7C   1518*  1521
T1.1        0000 2BD4   1296   1298*
T1.2        0000 2C1A   1319   1321*
T3S0        0000 2D86   1519   1521*
T3S1        0000 2D96   1526*  1545
T3S2        0000 2DB6   1535*  1544
T3S3        0000 2DCA   1540   1542*
T3S3.4      0000 2DD0   1533   1545*
T3S3.6      0000 2DE4   1550   1552*
T3S4        0000 2DF0   1556*  1574
T3S5        0000 2E10   1566*  1573
T3S6        0000 2E20   1569   1571*
T3S7        0000 2E26   1563   1574*
T5S1        0000 2FB0   1785*  1788
T5S1.5      0000 2FBA   1786   1788*
T5S2        0000 2FE0   1800*  1803
T5S2.5      0000 2FEA   1801   1803*
T6ER10      0000 3288   2033   2099*
T6ER11      0000 3290   2043   2102*
T6MSG       0000 36A6   1964   2522*
T6S1        0000 3184   2003*  2010
T6S10       0000 31FC   2044*  2103
T6S2        0000 3194   2007   2009*
T6S2.5      0000 3198   2004   2010*
T6S3        0000 319C   2012*
T6S4        0000 319E   2013*  2096
T6S5        0000 31A0   2014*  2066
T6S6        0000 31A2   2015*  2052
T6S7        0000 31C8   2026   2028*
T6S8        0000 31DE   2034*  2100
T6S9        0000 31F2   2039   2041*
T7MM1       0000 3304   2156   2179*
T7MM2       0000 3312   2179   2186*
T7MSG       0000 36CC   2160   2526*
T7OUTMSG    0000 32D4   2160*  2175
T7S1        0000 32B2   2149*  2155
```

```
T7S1.5    0000 32C8   2150  2155*
T7S2      0000 32E8   2166* 2174
T7S3      0000 32EC   2168* 2169
T7S4      0000 332C   2195* 2230
T7S5      0000 3334   2198* 2225
T7S6      0000 334E   2205  2207*
T7S7      0000 335E   2211  2213*
T7S8      0000 336E   2217  2219*
T7S9      0000 337E   2201  2223  2225*
T8LOMSG   0000 36F2   2418  2527*
T8LOPRT   0000 3522   1791  1793  2275  2418*
T8SW      0000 33C6   2281  2283* 2284
T8SW1     0000 33CA   2284*
T8SW2     0000 33D2   2286* 2289
T8SW3     0000 33DE   2287  2291*
T8SX      0000 3422   2310* 2339
TEMP      0000 200C    118*  285   288   298   301   303  2426  2429
TEST      0000 2A2A    270   347   375   388   397   435 1112* 1113  1137  1139
TEST0     0000 2B66   1193  1231*
TEST1     0000 2BBC   1194  1289*
TEST2     0000 2C4E   1195  1372*
TEST3     0000 2D66   1196  1510*
TEST4     0000 2E2E   1197  1612*
TEST5     0000 2F92   1198  1774*
TEST6     0000 3108   1199  1955*
TEST6ALL  0000 317A   1975  1979  1982  1986  1989  1993  1999*
TEST7     0000 3298   1200  2139*
TEST8     0000 3398   1201  2268*
TESTOP    0000 22B2    348   372*
TESTS     0000 2B54    458  1193*
TITLE     0000 2B1E    191  1180*
TOCS      0000 2B76   1235* 1240
TOTAL     0000 29A6    414   490   498   501   527   529   531   532   554 1074*
TOTERR    0000 29A8    415   490   531   562   604   606 1075* 2471  2473
TOTMSG    0000 29EA    550  1097*
TSTBRK    0000 27BE    341   448   471   495   773   866* 1307  1329  1422  1456  1531  1561  1648
                      1698  1817  2070  2172  2228  2314
TSTBRK1   0000 2816    884   893*  895
TSTBRK2   0000 281E    882   892   896*
TSTBRK3   0000 2832    870   872   874   886   891   901*
TSTBRK4   0000 27FA    877   883*
TSTBRK5   0000 27EA    878*  881
TSTDU     0000 2842    491   545   597   730   792   811   821   909*
TSTEND    0000 23A4    464* 1305  1327  1337  1398  1420  1454  1529  1559  1576  1624  1646  1696
                      1808  1815  1995  2068  2170  2226  2231  2312  2340  2463  2465
TSTMSG    0000 29D4    449  1092* 1093
TSTOP1    0000 22C2    373   378*
TSTOP2    0000 22CA    381*  387
TSTOP4    0000 22D8    386*
TTYGET    0000 289A    943*
UNARY     0000 25BA    384   660*
UNARY1    0000 25BC    661*  665
VHILIM    0000 3718   1794  1805  1961  2000  2540*
VLOLIM    0000 3716   1829  1909  1956  1999  2539*
WASDU     0000 29A2    188   394   416   525   548   732   735   745   829  1072*
```

WASD?1	0000	29A4	189	395	493	733	747	1073*
ZERO1	0000	28C4	963*	964				