PERKIN-ELMER

MULTI-MEDIA DIAGNOSTIC (MMD) LOADER

(32-Bit)

Consists of:

Program Description	06-176M95R05A15
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06-176F02M99R05

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MULTI-MEDIA DIAGNOSTIC (MMD) LOADER

1. PROGRAM TITLE

Multi-Media Diagnostic (MMD) Loader

06-176F01	16-bit processors
06-176F02	32-bit processors

2. PURPOSE OF THE PROGRAM

The MMD Loader facilitates program retrieval from bulk storage media created using the Multi-Media (MMD) Generator (06-177) or the Multi-Media (MMD) Cross Generator (06-252). It is an integral part of all Perkin-Elmer MMD Packages.

3. MINIMUM HARDWARE REQUIREMENTS

- Processor - any 16-bit processor with 24kb of memory or any 32-bit processor with 32kb of memory
- Display Panel
- Input Device - Magnetic tape 9-Track (800 or 1600 bpi) or High Performance Tape Drive (HPTD) in 800 or 1600 bpi mode.

  or

  13.5Mb or 10Mb disk with Selector Channel (SELCH) or 67Mb or 256Mb disk with SELCH.

NOTE

The HPTD and the 13.5Mb disk are supported on 32-bit systems only.

3.1 Optional Output Devices

- Teletype (TTY) or Carousel 30 on current loop interface (CLI)
- VDU on PASLA (FDPX)
- Line printer
- Carousel 300 on PASLA (FDPX)
- VDU, TTY, or Carousel on system terminal controller

3.2 Optional Boot Loading Devices

- TTY
- High speed paper tape reader (HSPTR)
- Carousel 35 with paper tape reader

NOTE

The boot loading device option is only applicable with disk input.

4. REQUIREMENTS OF THE MMD LOADER SYSTEM

The Device Definition Table, memory locations X'78' through X'7F', must be set up as indicated in the following table.

TABLE 1 DEVICE DEFINITION TABLE

	MEMORY LOCATIONS			
INPUT DEVICE	X'78'	X'7A'	X'7C'	X'7E'
Magnetic tape	XXA1	0000	00SS	0000
HPTD	XX40	0000	00SS	0000
Disk	*1399 **0294	DDTT	CCSS	0000

* If the disk will be boot loaded from HSPTR
** If the disk will be boot loaded from the TTY. Refer to Section 5.2

NOTE

XX = the magnetic tape or HPTD device address. Location X'7A' must be set to X'0000'.

CC = the disk controller address

TT = 3B for a 13.5Mb disk
33 for a 10Mb disk
35 for a 67Mb disk
36 for a 256Mb disk

DD = the disk device address

SS = the SELCH address (must be 0 if the magnetic tape is not on a SELCH)

5. LOADING

The two MMD Loaders are the first programs on all MMD Packages. Follow the directions below for the type of media being used.

5.1 Magnetic Tape/Cassette Loading

To load the required MMD Loader from the Magnetic Tape/Cassette MMD Package, perform the following steps:

1. Have the device online, at load point, and write protected.

2. Enter the X'50' sequence shown in Section 5.3.

3. Set up the Device Definition Table as described in Section 4. @78 C5A1 7A=0 7C=50 7E=0

4. Execute at address X'30'. The MMD Loader will be loaded into memory.

5. When the processor halts, observe the display panel. If X'EE' is displayed, the load resulted in parity error. Return to Step 2. If X'FFFF' is displayed, MMD Loader is awaiting data input. See Section 6 for operating procedures.

5.2 Disk Boot Loading

The 06-250M67 Multi-Media disk pack is boot loadable using the automatic load option (ALO) or the loader storage unit (LSU). This capability can be used on 16-or 32-bit systems. The following paragraphs describe the procedures. In all cases, the Multi-Media disk pack must be mounted and hardware write protected.

On Processors With Displays:

- Set up low memory as though you would load an operating system:

LOCATION	CONTENTS	
0030	0000	
0032	0000	
0034	0000	
0036	0050	
0050	D500	Autoload instruction
0052	00CF	
0054	4300	
0056	0080	
0078	1399	Paper tape device number/command
007A	C633	Disk address and OS device code
007C	B6F0	Controller address and SELCH address
007E	0111	OS extension (.111 means MMD)

- If the system does not have an LSU or ALO, mount the OS boot load paper tape in the paper tape reader (03-074M17 for 32-bit systems or 03-098M17 for 16-bit systems). Select address X'30' and execute. If the system has an LSU or ALO, only locations X'7A', X'7C', and X'7E' need be set up. Enable the LSU or ALO and depress INITIALIZE.

- As soon as the initial program load (IPL) is complete, X'FFFF' will appear on the display panel. Disable the LSU or ALO and proceed as with normal MMD.

On Processors Without Display (1620, etc.):

- Enable the IPL and depress INITIALIZE. Observe that the following is output to the system console:

Non-Extended Memory	or	Extended Memory
BASIC TEST COMPLETE MEMORY OK		BASIC TEST COMPLETE MEMORY 00000-07FFF OK MEMORY 08000-0FFFF OK . . .
SERIES SIXTEEN CPUnnKB LOAD DSC1.002?		where nnKB is the memory size.

- Type the letter N on the system console. N means no.
- The system then responds with available devices:

```
LOAD DEVICES
DSC2 OK
DSC1 OK
    .
    .
    .
ENTER DEVN.OSID
```

- Enter the following:

```
DSC1.111
```

- The following should be output:

```
MMDL-INPUT SEQUENCE NUMBER
```

- Memory locations X'7A' through X'7E' have been set up by the IPL sequence with default values for the 10Mb removable platter. If necessary, modify these locations and re-execute from address X'4000'.
- Proceed as with normal MMD.

On Processors Without Display (3200, etc.):

- Enable the IPL and depress INITIALIZE. Observe that the following is output to the system console:

```
3200 LSU LOADER R00-00
DEVS
MG85
MGC5
DS5R
DS5F
DS67
D256
FLPY
OTHR
DEVICE=
```

- If the system has default addresses, enter DS5R, otherwise, enter OTHR and the applicable addresses.

  Example:

```
DEVICE = OTHR
DEV# = C6
CODE = 33
CTLR = B6
SLCH = F0
```

- The following should be output:

```
VOL = MMD,FILE =
```

- Enter:

```
OS32MDL2.111
```

- The following should be output:

```
MMDL-INPUT SEQUENCE NUMBER
```

- Memory locations X'7A' through X'7E' have been set up by the IPL sequence with default values for the 10Mb removable platter. If necessary, modify these locations and re-execute from address X'6000'.
- Proceed as with normal MMD.

5.3 X'50' Sequence

Manually enter the X'50' sequence into memory.

LOCATION	CONTENTS
X'30'	Y'0000'
X'32'	X'0000'
X'34'	X'0000'
X'36'	Y'0050'
X'50'	X'D500'
X'52'	X'00CF'
X'54'	X'4300'
X'56'	X'0080'

@78 'C5A1'
@7A '0
@7C '00'
@7E '0

enter Seq #
@
@A00

6. OPERATING PROCEDURES

MMD Loader is in the input mode (waiting for data) when X'FFFF' is displayed, and the processor is in the wait state. At this time, two functions can be performed. The entire media can be listed to a print device, or a program can be loaded from the MMD Loader media.

6.1 Listing the Media

The program will select the I/O device that will produce hard copy. The priority used is line printer, CLI, PASLA/system terminal controller. Enter X'0000' on the switches or hexadecimal display panel. Depress EXE or RUN, depending on the panel type. The program information will be listed on the specified device. See Appendix A for sample listing. If the listing is being output to any device except the line printer, the listing pauses after 20 lines are displayed. To continue printing, depress EXE or RUN, depending on the panel type. See Section 7 for error and completion displays.

6.2 Loading a Program

Enter the sequence number of the desired program on the switches or hexadecimal display panel. The sequence numbers are included with the initial package and can be recreated with the list option. See Section 6.1. Depress EXE or RUN depending on the panel type. The program specified is located and loaded if it exists on the media. See following NOTES and Section 7 for error and completion displays.

NOTES

1. For Series 16 and Series 3200 Processors, the console mode may be entered at any time by depressing the at (@) key.

2. If magnetic tape is the input media, the program to be loaded must be forward of the present position of the tape.

7. ERROR AND COMPLETION DISPLAYS

If an error occurs while the MMD Loader is processing or when processing is complete, a code is output to the display panel. Refer to Table 2 for the meaning of each code.

TABLE 2 ERROR CODES

CODE	MEANING
*XXE0	Disk does not contain recognizable information
*XXE3	Unrecoverable read error
*XXE7	Magnetic Tape/Cassette Error
*XXE8	Disk error
BB	Program not on the media
CC	Load error
DD	Attempt to load over MMDL
EE	CHKSUM error on the program loaded
FF	Normal termination; job complete without error
F0	(16-bit) FLPT Arithmetic Fault
	(32-bit) Arithmetic Fault
F1	Illegal instruction
F2	Machine malfunction
F3	Arithmetic Fault (16-bit)
F5	System Queue Service (32-bit only)
F6	MAC interrupt (32-bit only)
F7	SVC interrupt (32-bit only)
*XX	When nonzero is the device address

If an error is detected, the only possible recovery is to retry the operation. If the media is a magnetic tape or cassette, rewind it to load point. If it is a disk, no action is needed. See Section 6 for desired operation.

If it is desired to perform another MMD Loader operation after the X'FF' termination display, (provided that no other operation has destroyed MMDL) restart the MMD Loader at its bias X'4000' for 16-bit processors and X'6000' for 32-bit processors. See Section 6 for the desired operation.

APPENDIX A
SAMPLE LISTING

SEQ #	06- #	REV.	NAME	LOW	HIGH
001	176	00	F01 MULTI-MEDIA DI.LDR. 16BIT	04000	04A1F
002	176	00	F02 MULTI-MEDIA DI.LDR. 32BIT	06000	06BIF
003	177	00	F01 MULTI-MEDIA DI.GEN. 16BIT	05000	06F37
004	177	00	F02 MULTI-MEDIA DI.GEN. 32BIT	07000	09059
010	003	08	MEMORY TEST PART 1	01000	0152F
011	003	08	MEMORY TEST PART 2	00080	010AB
012	003	08	MEMORY TEST PART 3	00080	004CD
013	106	06	PROCESSOR TEST PART 1	002D0	01FFF
014	106	06	PROCESSOR TEST PART 2	002D0	01D62
016	135	01	MEMORY PROTECT TEST	00080	00BFA
017	143	00	MOS MEMORY HOLD TEST	00080	00305
018	144	00	MOS PARITY INITIALIZE TEST	00080	000A3
019	158	00	SERIES 32 BASIC TEST	00080	0029F
01A	153	00	MODEL 7/32 HW PROCESSOR TEST	00A00	02001
01B	154	01	SERIES 32 PROCESSOR TEST PART1	00A00	03F3F
01C	155	00	SERIES 32 PROCESSOR TEST PART2	00A00	02001
01D	156	01	F01 SER. 32 MEMORY TEST PART 1	02000	0266R
01E	156	01	F02 SER. 32 MEMORY TEST PART 2	00A00	0186R
01F	156	01	F03 SER. 32 MEMORY TEST PART 3	00A00	01453
020	148	00	SERIES 6A MEMORY TEST PART1	00080	004AB
021	148	00	SERIES 6A MEMORY TEST PART2	01000	012EB
022	159	02	SERIES 32 SYSTEM EXERCISER	00A00	059D7
023	160	00	MEMORY ACCESS CONTROLLER TEST	00A00	01AB9
100	004	04	TELETYPE BASIC CONFIDENCE TEST	00080	00A51
102	071	00	801 AUTO CALL UNIT TEST	00080	002FD
103	101	00	DIGITAL MULTIPLEXOR TEST	00A00	00F8F
105	122	03	DISC TEST/FORMATTER	00A00	029D3
106	127	01	PALS OFF-LINE TEST	00A00	02B78
107	129	04	UNIVERSAL LOGIC INTERFACE TEST	00A00	00B99
108	131	01	MAGNETIC TAPE & CASSETTE TEST	00A00	0315D
109	132	02	201/301 DATA SET ADAPTER TEST	00400	01C27
10A	133	01	UNIVERSAL CLOCK MODULE TEST	00A00	01647
10B	134	00	8 LINE INTERRUPT MODULE TEST	00A00	01465
10C	137	00	HIGH SPEED PAPER TAPE R/P	00A00	01E4D
10D	139	01	16 BIT LSU SUPPORT PROGRAM	00A00	01A1F
10E	140	00	DYNAMIC CONTROL STORAGE TEST	00A00	018B5
110	147	00	CONVERSION EQUIPMENT TEST	00A00	0233R
112	149	00	F02 MUX BUS SWITCH TEST PART2	00A00	00E61
113	150	00	SENSE CONTACT MODULE TEST	00A00	00F5F
114	151	00	RELAY DRIVER TEST	00A00	00E53
115	163	01	GRAP. DISPLAY TERMINAL TEST	00A00	017C8
116	164	00	20 SURFACE DISC TEST	00A00	02D97
118	167	00	F01 MA 360/370 IF. TEST INTER.	00A00	03955
200	161	01	EXTENDED SELECTOR CHANNEL TEST	00A00	01811
201	165	01	SERIES 32 LSU SUPPORT PROGRAM	00A00	02789

```
PROG= MMD          ASSEMBLED BY CAL 03-066R08-00    (32-BIT)
                                          SCRAT                                            MDL00010
                                          CROSS                                            MDL00020
                                          SQUEZ                                            MDL00030
                           *              SQCHK                                            MDL00040
                                          WIDTH 120                                        MDL00050
  000000I                                 IFZ   ADC-2                                      MDL00060
                           MMD            PROG  MMD LOADER 06-176F01R05M96A13              MDL00070
                                          ELSE                                             MDL00080
                           MMD            PROG  MMD LOADER 06-176F02R05M91A13              MDL00090
                                          ENDC                                             MDL00100
                           *     COPYRIGHT  C  PERKIN-ELMER CORPORATION  APRIL 1979        MDL00110
                           *     MULTI - MEDIA DIAGNOSTIC LOADER R02                       MDL00120
          0000 0000        TETOS          EQU   0                                          MDL00130
          0000 0000        R0             EQU   0                                          MDL00140
          0000 0001        R1             EQU   1                                          MDL00150
          0000 0002        R2             EQU   2                                          MDL00160
          0000 0003        R3             EQU   3                                          MDL00170
          0000 0004        R4             EQU   4                                          MDL00180
          0000 0005        R5             EQU   5                                          MDL00190
          0000 0006        R6             EQU   6                                          MDL00200
          0000 0007        R7             EQU   7                                          MDL00210
          0000 0008        R8             EQU   8                                          MDL00220
          0000 0009        R9             EQU   9                                          MDL00230
          0000 000A        RA             EQU   10                                         MDL00240
          0000 000B        RB             EQU   11                                         MDL00250
          0000 000C        RC             EQU   12                                         MDL00260
          0000 000D        RD             EQU   13                                         MDL00270
          0000 000E        RE             EQU   14                                         MDL00280
          0000 000F        RF             EQU   15                                         MDL00290
                           *    FOR PROPER EXECUTION OF THIS PROGRAM THE DEVICE DEFINITION MDL00300
                           *    TABLE MUST BE SET UP PRIOR TO LOADING THIS PROGRAM.  THE   MDL00310
                           *    REQUIRED FORMAT IS:                                        MDL00320
                           *                                                               MDL00330
                           *                                 LOCATIONS                     MDL00340
                           *     DEVICE              X'78'     X'7A'     X'7C'     X'7E'  MDL00350
                           *                                                               MDL00360
                           *    MAG TAPE &           DDA1      0000      00SS      00LL   MDL00370
                           *    CASSETTE                                                   MDL00380
                           *                                                               MDL00390
                           *                                                               MDL00400
                           *    DISC                 YYZZ      DDTT      CCSS      00LL   MDL00410
                           *                                                               MDL00420
                           *                                                               MDL00430
                           *        WHERE:      DD = THE DEVICE WITH THE MAGNETIC MEDIA    MDL00440
                           *                    CC = THE CONTROLLER ADDRESS IF DD IS A DISC MDL00450
                           *                    TT = DISC TYPE INDICATOR                   MDL00460
                           *                         31 = 2.5 MB DISC                      MDL00470
                           *                         33 = 10 MB DISC                       MDL00480
                           *                         35 = 67 MB DISC                       MDL00490
                           *                         36 = 256 MB DISC                      MDL00500
                           *                    SS = THE SELCH ADDRESS                     MDL00510
                           *                    YY = THE DEVICE ADDRESS OF THE DISC BOOT LOADING MDL00520
                           *                         DEVICE.                               MDL00530
```

```
                                54 *                     ZZ = THE READ COMMAND FOR THE BOOT LOAD DEVICE     MDL00540
                                55 *                     LL = THE LOADER INDICATOR                          MDL00550
                                56 *                          00 = 16 BIT LOADER                            MDL00560
                                57 *                          01 = 32 BIT LOADER                            MDL00570
000000I                         58 *                                                                        MDL00580
                                59          IFZ   TETOS-1                                                   MDL00590
                                60          IFZ   ADC-2                                                     MDL00600
                                61          DS    X'60'           FILLER                                    MDL00610
                                62          BS    BOOTSTRT        SKIP SPT POINTER                          MDL00620
                                63          DC    Z(DIRECT)       DUMMY SPT POINTER                         MDL00630
                                64 BOOTSTRT B     START           DO IT                                     MDL00640
                                65          DS    X'10'           FILLER                                    MDL00650
                                66          DCX   0                                                         MDL00660
                                67          DCX   C633                                                      MDL00670
                                68          DCX   B6F0                                                      MDL00680
                                69          DCX   0                                                         MDL00690
                                70          DS    16256           FILLER                                    MDL00700
                                71          ELSE                                                            MDL00710
                                72          ORG   X'60'                                                     MDL00720
                                73          BS    BOOTSTRT        SKIP SPT POINTER                          MDL00730
                                74          DC    Z(DIRECT)       DUMMY SPT POINTER                         MDL00740
                                75 BOOTSTRT B     START           DO IT                                     MDL00750
                                76          ORG   X'78'                                                     MDL00760
                                77          DCX   0                                                         MDL00770
                                78          DCX   C633                                                      MDL00780
                                79          DCX   B6F0                                                      MDL00790
                                80          DCX   1                                                         MDL00800
                                81          ORG   X'6000'                                                   MDL00810
                                82          ENDC                                                            MDL00820
        0000 0000I              83          ENDC                                                            MDL00830
000000I 4300 8B3E =000B42I      84 START    EQU   *                                                         MDL00840
000004I 0000                    85          B     LCORE                                                     MDL00850
        0000 0011               86 DISFLG   DCX   0                                                         MDL00860
        0000 0010               87 PASWAD   EQU   X'11'                                                     MDL00870
000006I 62                      88 PASRAD   EQU   X'10'                                                     MDL00880
000007I 02                      89 LPAD     DB    X'62'                                                     MDL00890
000008I EE                      90 TTYAD    DB    X'02'                                                     MDL00900
000009I 00                      91 PASC2    DB    X'EE'                                                     MDL00910
00000AI 08                      92          DB    0               FILLER                                    MDL00920
00000BI 09                      93 SOD      DB    8               START OF DIRECTORY                        MDL00930
        0000 00C0               94 SOP      DB    9               START OF PROGRAM SPACE                    MDL00940
        0000 0094               95 STCADR   EQU   X'C0'                                                     MDL00950
        0000 0098               96 TTYRD    EQU   X'94'                                                     MDL00960
        0000 00A1               97 TTYWR    EQU   X'98'                                                     MDL00970
        0000 00A3               98 PASRD    EQU   X'A1'                                                     MDL00980
        0000 0002               99 PASWR    EQU   X'A3'                                                     MDL00990
        0000 0082              100 MBWR     EQU   X'02'                                                     MDL01000
        0000 000CI             101 MBRD     EQU   X'82'                                                     MDL01010
00000CI C800 3030              102 BEGIN    EQU   *                                                         MDL01020
000010I 4000 8D1C =000D30I     103          LHI   R0,X'3030'      LOAD ZEROS                                MDL01030
000014I 4000 8D1A =000D32I     104          STH   R0,PGMNUM       CLEAR                                     MDL01040
000018I 240F                   105          STH   R0,PGMNUM+2     CLEAR                                     MDL01050
00001AI 4000 FFE6 =000004I     106          LIS   R0,15           SET                                       MDL01060
00001EI 2411                   107          STH   R0,DISFLG       SET                                       MDL01070
                               108          LIS   R1,1                                                      MDL01080
```

```
000020I  DE10 8CEA =000D0EI   109          OC     R1,ABORT1                                  MDL01090
000024I  2420                 110          LIS    R2,0                                       MDL01100
000026I  C830 00FF            111          LHI    R3,X'FF'                                   MDL01110
00002AI  9A13                 112          WDR    R1,R3                                      MDL01120
00002CI  9A13                 113          WDR    R1,R3                                      MDL01130
00002EI  9A12                 114          WDR    R1,R2                                      MDL01140
000030I  9A12                 115          WDR    R1,R2                                      MDL01150
000032I  DE10 8CD9 =000D0FI   116          OC     R1,ABORT1+1                                MDL01160
000036I  2143                 117          BTFS   4,NODIS          FALSE SYNC                MDL01170
000038I  C200 8074 =0000B0I   118          LPSW   GETNUM                                     MDL01180
         0000 003CI           119  NODIS   EQU    *                                          MDL01190
00003CI  2400                 120          LIS    R0,0             CLEAR                     MDL01200
00003EI  4000 FFC2 =000004I   121          STH    R0,DISFLG        CLEAR                     MDL01210
000042I  E640 81E6 =00022CI   122          LDAI   R4,MESOK         GET ADDRESS               MDL01220
000046I  E680 8203 =00024DI   123          LDAI   R8,MESOKEND+1    GET END ADDRESS           MDL01230
         0000 004AI           124  OUT04   EQU    *                                          MDL01240
00004AI                       125          IFNZ   ADC-2                                      MDL01250
00004AI  C810 0011            126          LHI    R1,PASWAD        LOAD PASLA WRITE ADDRESS  MDL01260
00004EI  D320 FFB6 =000008I   127          LB     R2,PASC2         LOAD CMD2                 MDL01270
000052I  9E12                 128          OCR    R1,R2            ISSUE CMD2                MDL01280
000054I  C820 00A3            129          LHI    R2,PASWR         LOAD WRITE COMMAND        MDL01290
                              130          ELSE                                              MDL01300
                              131          LHI    R1,X'C0'         LOAD STC ADDRESS          MDL01310
                              132          LHI    R2,MBWR          LOAD WRITE COMMAND        MDL01320
                              133          ENDC                                              MDL01330
000058I  9E12                 134          OCR    R1,R2            ISSUE WRITE COMMAND       MDL01340
00005AI  D354 0000            135  OUT03   LB     R5,0(R4)         LOAD DATA BYTE            MDL01350
00005EI  9D12                 136          SSR    R1,R2            SENSE STATUS              MDL01360
000060I  2081                 137          BTBS   8,1              WAIT FOR BUSY NOT         MDL01370
000062I  9A15                 138          WDR    R1,R5            WRITE DATA                MDL01380
000064I  2641                 139          AIS    R4,1             INCRIMENT                 MDL01390
000066I  0548                 140          CLAR   R4,R8            DONE??                    MDL01400
*000068I 2037                 141          BNE    OUT03            NO, LOOP                  MDL01410
00006AI  2460                 142          LIS    R6,0             CLEAR                     MDL01420
00006CI                       143          IFNZ   ADC-2                                      MDL01430
00006CI  C810 0010            144          LHI    R1,PASRAD        LOAD PASLA READ ADDRESS   MDL01440
000070I  C820 00A1            145          LHI    R2,PASRD         LOAD READ COMMAND         MDL01450
                              146          ELSE                                              MDL01460
                              147          LHI    R2,MBRD          LOAD READ COMMAND         MDL01470
                              148          ENDC                                              MDL01480
000074I  9E12                 149          OCR    R1,R2            ISSUE READ COMMAND        MDL01490
000076I  9B12                 150          RDR    R1,R2            DUMMY READ                MDL01500
000078I  9D12                 151  OUT02   SSR    R1,R2            SENSE STATUS              MDL01510
00007AI  2081                 152          BTBS   8,1              WAIT FOR BUSY NOT         MDL01520
00007CI  9B12                 153          RDR    R1,R2            READ DATA                 MDL01530
00007EI  9A12                 154          WDR    R1,R2            ECHO DATA                 MDL01540
000080I  C420 007F            155          NHI    R2,X'7F'         STRIP PARITY              MDL01550
000084I  C520 005F            156          CLHI   R2,X'5F'         POUND??                   MDL01560
000088I  4330 FFBE =00004AI   157          BE     OUT04            LOOP                      MDL01570
00008CI  C520 000D            158          CLHI   R2,X'0D'         CR??                      MDL01580
000090I  4330 8054 =0000E8I   159          BE     FINUM2           LOAD IT                   MDL01590
000094I  C520 0040            160          CLHI   R2,C'a'          ADDRESS REQUEST??         MDL01600
000098I  2133                 161          BNES   OUT05                                      MDL01610
00009AI  8800                 162          DC     X'8800'          BREAKPOINT                MDL01620
00009CI  2201                 163          DC     X'2201'          LOOP                      MDL01630
```

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 00009EI  D226 8C8E =000D30I    164  OUT05    STB   R2,PGMNUM(R6)       STORE                                  MDL01640
 0000A2I  2661                  165            AIS   R6,1               INCREMENT                              MDL01650
*0000A4I  C560 0004             166            CLAI  R6,4               DONE??                                 MDL01660
 0000A8I  4280 FFCC =000078I    167            BL    OUT02              NO, LOOP                               MDL01670
 0000ACI  4300 FF8C =00003CI    168            B     NODIS              RESTART                                MDL01680
 0000B0I                        169            ALIGN 8                                                         MDL01690
          0000 00B0I            170  GFTNUM    EQU   *                                                       MDL01700
 0000B0I                        171            IFZ   ADC=2                                                     MDL01710
                                172            DC    X'F000',Z(FINUM)                                        MDL01720
                                173            ELSE                                                          MDL01730
 0000B0I  0000                  174            DC    X'0000',X'F0F0'                                         MDL01740
 0000B2I  F0F0
 0000B4I  0000                  175            DC    X'0000',Z(FINUM)                                        MDL01750
 0000B6I  00B8I
                                176            ENDC                                                          MDL01760
 0000B8I  2411                  177  FINUM     LIS   R1,1                                                    MDL01770
 0000BAI  DE10 8C50 =000D0EI    178            OC    R1,ABORT1                                               MDL01780
 0000BEI  9B12                  179            RDR   R1,R2              READ THE NUMBER ENTERED                MDL01790
 0000C0I  9B13                  180            RDR   R1,R3              IN HEX                                 MDL01800
 0000C2I  1138                  181            SLLS  R3,8                                                      MDL01810
 0000C4I  0623                  182            OAR   R2,R3              GET THE THREE DIGITS                   MDL01820
*0000C6I  C420 0FFF             183            NAI   R2,X'FFF'                                                 MDL01830
 0000CAI  4020 8C7E =000D4CI    184            STH   R2,HEXNUM                                                 MDL01840
 0000CEI  2452                  185            LIS   R5,2                                                      MDL01850
 0000D0I  C830 0FFF             186            LHI   R3,X'0FFF'         MASK OFF 3 DIGITS                      MDL01860
 0000D4I  0432                  187            NAR   R3,R2                                                     MDL01870
 0000D6I  242F                  188  FINUM1    LIS   R2,X'F'            CONVERT TO ASCII                       MDL01880
 0000D8I  0423                  189            NAR   R2,R3                                                     MDL01890
 0000DAI  D342 8C00 =000CDEI    190            LB    R4,ASCI(R2)                                               MDL01900
 0000DEI  D245 8C4E =000D30I    191            STB   R4,PGMNUM(R5)                                             MDL01910
 0000E2I  1034                  192            SRLS  R3,4                                                      MDL01920
 0000E4I  2751                  193            SIS   R5,1                                                      MDL01930
 0000E6I  2218                  194            BNMS  FINUM1             NUMBER IS NOW IN ASCII IN PGMNUM       MDL01940
          0000 00E8I            195  FINUM2    EQU   *                                                       MDL01950
 0000E8I  24A0                  196            LIS   RA,0               SETUP                                  MDL01960
 0000EAI  24B1                  197            LIS   RB,1               BXLE                                   MDL01970
 0000ECI  24C2                  198            LIS   RC,2               COUNT                                  MDL01980
 0000EEI  24D0                  199            LIS   RD,0               CLEAR                                  MDL01990
 0000F0I  D3UA 8C3C =000D3UI    200  ATH       LB    R0,PGMNUM(RA)      GET ASCII                              MDL02000
 0000F4I  C500 003A             201            CLHI  R0,X'3A'           LEGAL 0-9??                            MDL02010
*0000F8I  238E                  202            BNC   ATF                MAY BE A-F                             MDL02020
 0000FAI  C500 0030             203            CLHI  R0,X'30'           LEGAL 0-9??                            MDL02030
 0000FEI  4280 8024 =000126I    204            BL    NOTHEX             INVALID NUMBER                         MDL02040
 000102I  C400 000F             205  HSAV      NHI   R0,X'F'            MASK                                   MDL02050
 000106I  11D4                  206            SLLS  RD,4               SHIFT                                  MDL02060
 000108I  06D0                  207            OAR   RD,R0              MERGE                                  MDL02070
 00010AI  C1A0 FFE2 =0000F0I    208            BXLE  RA,ATH             LOOP                                   MDL02080
 00010EI  40D0 8C3A =000D4CI    209            STH   RD,HEXNUM          STORE                                  MDL02090
*000112I  230D                  210            B     FINUM3             GO                                     MDL02100
 000114I  C500 0041             211  ATF       CLHI  R0,X'41'           LEGAL A-F??                            MDL02110
*000118I  2187                  212            BL    NOTHEX             INVALID NUMBER                         MDL02120
 00011AI  C500 0046             213            CLHI  R0,X'46'           LEGAL A-F??                            MDL02130
*00011EI  2384                  214            BNC   NOTHEX             INVALID NUMBER                         MDL02140
 000120I  2609                  215            AIS   R0,9               MAKE LSD HEX                           MDL02150
 000122I  4300 FFDC =000102I    216            B     HSAV               CONTINUE                               MDL02160
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000126I  2400                  217  NOTHEX   LIS   R0,0         CLEAR                                        MDL02170
000128I  4300 FFD6 =000102I    218           B     HSAV         CONTINUE                                     MDL02180
00012CI  4840 007A             219  FINUM3   LH    R4,X'7A'     LOAD INPUT DEVICE ADDRESSES                  MDL02190
000130I  4330 805A =00018EI    220           BZ    MTDEV        0=MAG TAPE                                   MDL02200
000134I  D3A0 007A             221           LB    RA,X'7A'     GET DEVICE ADDRESS                           MDL02210
000138I  D3B0 007D             222           LB    RB,X'7D'     GET SELCH ADDRESS                            MDL02220
00013CI  DEB0 8BC4 =000D04I    223           OC    RB,STOP      STOP A SELCH                                 MDL02230
000140I  DEB0 8BC0 =000D04I    224           OC    RB,STOP      STOP A SELCH                                 MDL02240
000144I  D3C0 007C             225           LB    RC,X'7C'     GET CONTROLLER ADDRESS                       MDL02250
000148I  D370 007B             226           LB    R7,X'7B'                                                  MDL02260
00014CI  2420                  227           LIS   R2,0         LOAD DEVICE COUNT                            MDL02270
00014EI  C570 003B             228           CLHI  R7,X'3B'     13.5 MB DISK?                      R05
000152I  4330 802E =000184I    229           BE    FINUM4       YES                                R05       MDL02300
000156I  2621                  230           AIS   R2,1         BUMP                                         MDL02310
000158I  C570 0032             231           CLHI  R7,X'32'     10 MB DISC (FIXED)??                         MDL02320
00015CI  4280 FEAC =00000CI    232           BL    BEGIN        ILLEGAL DEVICE IF LESS             R05
000160I  4330 8020 =000184I    233           BE    FINUM4       YES, TREAT AS REMOVABLE                      MDL02330
000164I  C570 0033             234           CLHI  R7,X'33'     10 MB DISC (REMOVABLE)??                     MDL02340
*000168I 233E                  235           BE    FINUM4       YES                                          MDL02350
00016AI  C570 0034             236           CLHI  R7,X'34'     40 MB DISC??                                 MDL02360
00016EI  4330 FE9A =00000CI    237           BE    BEGIN        NOT SUPPORTED                                MDL02370
000172I  2621                  238           AIS   R2,1         BUMP                                         MDL02380
000174I  C570 0035             239           CLHI  R7,X'35'     80 MB DISC??                                 MDL02390
*000178I 2336                  240           BE    FINUM4       YES                                          MDL02400
00017AI  2621                  241           AIS   R2,1         BUMP                                         MDL02410
00017CI  C570 0036             242           CLHI  R7,X'36'     300 MB DISC??                                MDL02420
000180I  4230 FE88 =00000CI    243           BNE   BEGIN        ILLEGAL DEVICE                               MDL02430
000184I  0872                  244  FINUM4   LDAR  R7,R2        SETUP DEVICE TYPE                            MDL02440
000186I  0A77                  245           AAR   R7,R7        DOUBLE DEVICE POINTER                        MDL02450
000188I  4070 8BC2 =000D4EI    246           STH   R7,TRKDEN                                                 MDL02460
00018CI  2306                  247           BS    CONTUE                                                    MDL02470
         0000 02EAI            248  MTEOV    EQU   DEOV                                                      MDL02480
00018EI  D3A0 0078             249  MTDEV    LB    RA,X'78'     GET MAG TAPE ADDRESS                         MDL02490
000192I  D3B0 007D             250           LB    RB,X'7D'     SET SELCH                                    MDL02500
000196I  24C0                  251           LIS   RC,0         SET CONTROLLER = 0                           MDL02510
         0000 0198I            252  CONTUE   EQU   *            ADDRESSES ARE LOADED                         MDL02520
000198I  4820 8BB0 =000D4CI    253           LH    R2,HEXNUM    GET THE NUMBER ENTERED(IN HGX)               MDL02530
00019CI  4330 84C0 =000660I    254           BZ    LIST         IF ZERO - GO LIST                            MDL02540
0001A0I  08CC                  255           LDAR  RC,RC        MAG TAPE ?                                   MDL02550
0001A2I  4230 80A8 =00024EI    256           BNZ   LODDIS       NO, LOAD DISC                                MDL02560
                               257  *   THIS ROUTINE WILL FORWARD FILE MARKS AND READ PDB'S UNTIL            MDL02570
                               258  *   THE NUMBER IN THE PDB MATCHES THE NUMBER ENTERED ON THE              MDL02580
                               259  *   DISPLAY, OR EOV IS REACHED.  IF THE NUMBER IS FOUND THE              MDL02590
                               260  *   PROGRAM ASSOCIATED WITH THAT NUMBER IS LOADED.                       MDL02600
0001A6I  D300 0079             261           LB    R0,X'79'     READ COMMAND                       R05
0001AAI  C500 00A1             262           CLHI  R0,X'A1'     NORMAL I/F?                        R05
0001AEI  2336                  263           BES   MT6250       YES, SKIP                          R05
0001B0I  DEA0 8B5C =000D10I    264           OC    RA,DISAB625  DISABLE 6250 I/F                   R05
0001B4I  DEA0 8B59 =000D11I    265           OC    RA,CLEAR625  CLEAR 6250 I/F                     R05
0001B8I  2305                  266           BS    MAGFF1       CONTINUE                           R05
         0000 01BAI            267  MT6250   EQU   *            *                                  R05
0001BAI  DEA0 8B3E =000CFCI    268           OC    RA,DISABL    DISABLE INTERRUPTS                           MDL02610
0001BEI  DEA0 8B3B =000CFDI    269           OC    RA,CLEAR     CLEAR CONTROLLER                             MDL02620
0001C2I  D300 0079             270  MAGFF1   LB    R0,X'79'     READ COMMAND                       R05
0001C6I  C500 00A1             271           CLHI  R0,X'A1'     NORMAL I/F?                        R05
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0001CAI  2334                272           BES    MT6251              YES, SKIP                         R05
0001CCI  DEA0 8B42 =000D12I  273           OC     RA,FWFM625          FORWARD FILE 6250 I/F             R05
0001D0I  2303                274           BS     MT6252              CONTINUE                          R05
0001D2I  DEA0 8B2A =000D00I  275  MT6251   OC     RA,FWFM             FORWARD FILE MARK                 R05
         0000 01D6I          276  MT6252   EQU    *                   *                                 R05
0001D6I  4100 88B6 =000A90I  277           BAL    R0,NOMOTN           WAIT                                       MDL02640
0001DAI  E650 8B86 =000D64I  278           LDAI   R5,PDB                                                         MDL02650
0001DEI  E660 8BB5 =000D97I  279           LDAI   R6,PDB+51                                                      MDL02660
0001E2I  E610 8104 =0002EAI  280           LDAI   R1,MTEOV                                                       MDL02670
0001E6I  4130 82B2 =00049CI  281           BAL    R3,READPB           READ THE PDB                               MDL02680
0001EAI  4830 8B42 =000D30I  282           LH     R3,PGMNUM           GET THE NUMBER ENTERED                     MDL02690
0001EEI  4530 8B72 =000D64I  283           CLH    R3,PDB              FIRST TWO DIGITS = ?                       MDL02700
0001F2I  4230 FFCC =0001C2I  284           BNE    MAGFF1              NO                                         MDL02710
0001F6I  D330 8338 =000D32I  285           LB     R3,PGMNUM+2         YES - COMPARE THIRD                        MDL02720
0001FAI  D340 8B68 =000D66I  286           LB     R4,PDB+2                                                       MDL02730
0001FEI  0534                287           CLAR   R3,R4               = ?                                        MDL02740
000200I  4230 FFBE =0001C2I  288           BNE    MAGFF1              NO, SKIP MORE'                             MDL02750
000204I  4130 8154 =00035CI  289           BAL    R3,MISTRT           SET THE NUMBER OF BLOCK TO BE COPIED       MDL02760
000208I  58D0 8808 =000D14I  290           LDA    RD,LOW              LOAD START ADDRESS                         MDL02770
00020CI  58E0 8B08 =000D18I  291           LDA    RE,HIGH             LOAD STOP ADDRESS                          MDL02780
000210I  4130 8848 =000A5CI  292  MOREMT   BAL    R3,STBKAD           ADJUST ADDRESS                             MDL02790
000214I  E610 800C =000224I  293           LDAI   R1,MTENDX           WRITE TO MEMORY                            MDL02800
000218I  4130 8280 =00049CI  294           BAL    R3,READPB                                                      MDL02810
00021CI  0844                295           LDAR   R4,R4               GET END INDICATOR                          MDL02820
00021EI  2237                296           BZS    MOREMT              FINISHED - NO                              MDL02830
000220I  4300 8232 =000456I  297           B      CHKSUM              YES                                        MDL02840
000224I  C810 00CC           298  MTENDX   LHI    R1,X'CC'            SHORT FILE                                 MDL02850
000228I  4300 8A28 =000C54I  299           B      ERROR               FILE MARK BEFORE END OF COUNT              MDL02860
00022CI  4D4D 444C 5230 3520 300  MESOK    DC     C'MMDLR05-INPUT SEQUENCE NUMBER',X'0D0A'                       MDL02870
000234I  494E 5055 5420 5345
00023CI  5155 454E 4345 204E
000244I  554D 4245 5220
00024AI  0D0A
00024CI  2A20                301  MESOKEND DC     C'*'                                                           MDL02880
                             302  *   THIS ROUTINE WILL SEARCH THE DISC DIRECTORY FOR A NUMBER                   MDL02890
                             303  *   THAT MATCHES THE NUMBER ENTERED ON THE DISPLAY, OR EOV.                    MDL02900
                             304  *   IF THE NUMBER IS FOUND THE PROGRAM ASSOCIATED WITH THAT                    MDL02910
                             305  *   NUMBER IS LOADED.                                                          MDL02920
         0000 024EI          306  LODDIS   EQU    *                                                              MDL02930
00024EI  D330 FDB8 =00000AI  307           LB     R3,SOD              GET START                                  MDL02940
000252I  4030 8AEA =000D40I  308           STH    R3,CYL              SET CYL TO ONE                             MDL02950
000256I  0788                309           XAR    R8,R8               SET SECTOR TO ZERO                         MDL02960
000258I  4080 8AE6 =000D42I  310           STH    R8,HEAD             SET HEAD TO ZERO                           MDL02970
00025CI  4130 8844 =000AA4I  311           BAL    R3,WDFT                                                        MDL02980
000260I  DEA0 8AA2 =000D06I  312           OC     RA,SEEK             SEEK                                       MDL02990
000264I  4130 8868 =000AD0I  313           BAL    R3,FRSRW            WAIT                                       MDL03000
000268I  E650 8B2C =000D98I  314           LDAI   R5,DIRECT                                                      MDL03010
00026CI  E660 8C27 =000E97I  315           LDAI   R6,DIRECT+255                                                  MDL03020
000270I  4130 8830 =000AA4I  316           BAL    R3,WDFT                                                        MDL03030
000274I  4130 8210 =000488I  317           BAL    R3,RDISC            READ THE DISC                              MDL03040
000278I  C830 EEEE           318           LHI    R3,X'EEEE'          IS KNOW INFO ON THE PACK ?                 MDL03050
00027CI  4530 8B18 =000D98I  319           CLH    R3,DIRECT                                                      MDL03060
000280I  2335                320           BES    DISCON              YES                                        MDL03070
000282I  C810 00E0           321           LHI    R1,X'E0'            NO - DISC DOES NOT CONTAIN KNOWN INFO      MDL03080
000286I  4300 89E6 =000C70I  322           B      ERRA                                                           MDL03090
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                                  DISCON  XAR   R2,R2                                          MDL03100
00028AI  0722
00028CI  4832 8508 =000D98I       UPDTX3  LH    R3,DIRECT(R2)       GET THE # FROM YHE DIRECTORY   MDL03110
000290I  4330 8056 =0002EAI               BZ    DEOV                END OF VOLUME - YES            MDL03120
000294I  4530 8A98 =000D30I               CLH   R3,PGMNUM           NO                             MDL03130
000298I  2138                             BNES  UPDTX2              IS THIS THE CURRENT            MDL03140
00029AI  D332 8AFC =000D9AI               LB    R3,DIRECT+2(R2)     NUMBER                         MDL03150
00029EI  D310 8A90 =000D32I               LB    R1,PGMNUM+2                                        MDL03160
0002A2I  0531                             CLAR  R3,R1                                              MDL03170
0002A4I  4330 8062 =00030AI               BE    FIND                YES                            MDL03180
0002A8I  2628                     UPDTX2  AIS   R2,8                NO - BUMP DIRECTORY POINTER    MDL03190
0002AAI  C520 0100                        CLHI  R2,X'100'           MAX  ?                         MDL03200
0002AEI  4230 FFDA =00028CI               BNE   UPDTX3              NO                             MDL03210
0002B2I  2681                             AIS   R8,1                MAX # OF SECTORS ?             MDL03220
0002B4I  4830 8A96 =000D4EI               LH    R3,TRKDEN                                          MDL03230
0002B8I  4583 803E =0002FAI               CLH   R8,SECTAB(R3)                                      MDL03240
*0002BCI 233C                             BE    UPDTX4              YES                            MDL03250
0002BEI  E650 8AD6 =000D98I       UPDTX5  LDAI  R5,DIRECT           NO                             MDL03260
0002C2I  E660 8BD1 =000E97I               LDAI  R6,DIRECT+255                                      MDL03270
0002C6I  4130 87DA =000AA4I               BAL   R3,WDFT                                            MDL03280
0002CAI  4130 81BA =00048BI               BAL   R3,RDISC            READ NEW DIRECTORY             MDL03290
0002CEI  2420                             LIS   R2,0                ZERO POINTER                   MDL03300
0002D0I  4300 FFB8 =00028CI               B     UPDTX3                                             MDL03310
0002D4I  4820 8A6A =000D42I       UPDTX4  LH    R2,HEAD                                            MDL03320
0002D8I  4523 8016 =0002F2I               CLH   R2,HDTAB(R3)                                       MDL03330
*0002DCI 2337                             BE    DEOV                                               MDL03340
0002DEI  2621                             AIS   R2,1                                               MDL03350
0002E0I  4020 8A5E =000D42I               STH   R2,HEAD             SAVE                           MDL03360
0002E4I  0788                             XAR   R8,R8               ZERO SECTOR                    MDL03370
0002E6I  4300 FFD4 =0002BEI               B     UPDTX5                                             MDL03380
0002EAI  C810 00BB                DEOV    LHI   R1,X'BB'                                           MDL03390
0002EEI  4300 8962 =000C54I               B     ERROR                                              MDL03400
0002F2I  0000                     HDTAB   DC    H'0'                13.5 MB              R05       MDL03410
0002F4I  0001                             DC    H'1'                10 MB                          MDL03420
0002F6I  0004                             DC    H'4'                80 MB                          MDL03430
0002F8I  0012                             DC    H'18'               300 MB                         MDL03440
0002FAI  0040                     SECTAB  DC    H'64'               13.5 MB              R05       MDL03450
0002FCI  0018                             DC    H'24'               10 MB                          MDL03460
0002FEI  0040                             DC    H'64'               80 MB                          MDL03470
000300I  0040                             DC    H'64'               300 MB                         MDL03480
000302I  0336                     CYLTAB  DC    H'822'              13.5 MB              R05       MDL03490
000304I  0197                             DC    H'407'              10 MB                          MDL03500
000306I  0336                             DC    H'822'              80 MB                          MDL03510
000308I  0336                             DC    H'822'              300 MB                         MDL03520
         0000 030AI               FIND    EQU   *                                                  MDL03530
00030AI  4882 8A8E =000D9CI               LH    R8,DIRECT+4(R2)     THE STARTING HEAD              MDL03540
00030EI  4080 8A2E =000D40I               STH   R8,CYL                                             MDL03550
000312I  D382 8A88 =000D9EI               LB    R8,DIRECT+6(R2)     SET THE SECTOR                 MDL03560
000316I  D332 8A85 =000D9FI               LB    R3,DIRECT+7(R2)     SET THE HEAD                   MDL03570
00031AI  4030 8A24 =000D42I               STH   R3,HEAD                                            MDL03580
00031EI  4130 87AE =000AD0I               BAL   R3,FRSRW            FILE READY                     MDL03590
000322I  4130 877E =000AA4I               BAL   R3,WDFT             SET UP FILE                    MDL03600
000326I  DEA0 89DC =000D06I               OC    RA,SEEK             SEEK                           MDL03610
00032AI  4130 87A2 =000AD0I               BAL   R3,FRSRW            WAIT                           MDL03620
00032EI  E650 8A32 =000D64I               LDAI  R5,PDB              SET UP ADDRESSES               MDL03630
000332I  E660 8A61 =000D97I               LDAI  R6,PDB+51                                          MDL03640
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000336I  4130 807A =0003B4I    378          BAL   R3,AVAILR                                  MDL03650
00033AI  4130 801E =00035CI    379          BAL   R3,MISTRT          SET UPP LOW AND HIGH      MDL03660
00033EI  58D0 89D2 =000D14I    380          LDA   RD,LOW                                       MDL03670
000342I  58E0 89D2 =000D18I    381          LDA   RE,HIGH                                      MDL03680
000346I  4130 8712 =000A5CI    382 DTRIP    BAL   R3,STBKAD          SET BLOCK LENGTH          MDL03690
00034AI  4040 89F6 =000D44I    383          STH   R4,AVAFLG          SAVE                      MDL03700
00034EI  4130 8062 =0003B4I    384          BAL   R3,AVAILR                                    MDL03710
000352I  4840 89EE =000D44I    385          LH    R4,AVAFLG          RESTORE                   MDL03720
000356I  2238                  386          BZS   DTRIP                                        MDL03730
000358I  4300 80FA =000456I    387          B     CHKSUM                                       MDL03740
                               388 *   THIS ROUTINE WILL READ THE LOW AND HIGH LIMITS FROM THE PDB   MDL03750
                               389 *   AND STORE THEM IN MEMORY AT THE LABELS LOW AND HIGH RESPECTIVELY.  MDL03760
                               390 *                                                              MDL03770
                               391 *        INPUT:                                                MDL03780
                               392 *                                                              MDL03790
                               393 *        REG 3 = RETURN ADDRESS                                MDL03800
                               394 *                                                              MDL03810
                               395 *        OUTPUT:                                               MDL03820
                               396 *                                                              MDL03830
                               397 *        LOCATION LOW  -  LOW ADDRESS TO BE COPIED             MDL03840
                               398 *                 HIGH -  HIGH ADDRESS TO BE COPIED            MDL03850
                               399 *                                                              MDL03860
                               400 *        REGISTERS USED:                                       MDL03870
                               401 *                                                              MDL03880
                               402 *             R1                                               MDL03890
                               403 *             R2                                               MDL03900
                               404 *                                                              MDL03910
00035CI  2410                  405 MISTRT   LIS   R1,0               SET THE LOW FLAG          MDL03920
00035EI  5030 89CA =000D2CI    406 MISTR1   STA   R3,MISTRN          SAVE RETURN               MDL03930
000362I  0733                  407 MISTR2   XAR   R3,R3              ZERO THE RESULT REG.      MDL03940
000364I  D331 8A0E =000D76I    408          LB    R3,PDB+18(R1)      GET HO BYTE OF ADDRESS    MDL03950
000368I  1138                  409          SLLS  R3,8               SHIFT                     MDL03960
00036AI  D321 8A09 =000D77I    410          LB    R2,PDB+19(R1)      GET MO BYTE OF ADDRESS    MDL03970
00036EI  0632                  411          OAR   R3,R2              OR IT IN                  MDL03980
000370I  1138                  412          SLLS  R3,8               SHIFT                     MDL03990
000372I  D321 8A02 =000D78I    413          LB    R2,PDB+20(R1)      GET LO BYTE OF ADDRESS    MDL04000
000376I  0632                  414          OAR   R3,R2              OR IT IN                  MDL04010
000378I  0811                  415          LDAR  R1,R1              R1 = 0                    MDL04020
00037AI  2136                  416          BNZS  MISHI              NO                        MDL04030
00037CI  5030 8994 =000D14I    417          STA   R3,LOW             YES THEN LOW WAS READ     MDL04040
000380I  2413                  418          LIS   R1,3                                         MDL04050
000382I  4300 FFDC =000362I    419          B     MISTR2                                       MDL04060
000386I  5030 898E =000D18I    420 MISHI    STA   R3,HIGH                                      MDL04070
00038AI  5830 8986 =000D14I    421          LDA   R3,LOW             GET LOW                   MDL04080
00038EI  E620 FC6E =000000I    422          LDAI  R2,START           IS IT < TPL ?             MDL04090
000392I  0532                  423          CLAR  R3,R2                                        MDL04100
000394I  2188                  424          BLS   PRGLOW             LOW < MDL HIGH MUST BE < MDL  MDL04110
000396I  E620 8A02 =000D9CI    425          LDAI  R2,END+4           LOW IS > TPL START, THEREFORE IT  MDL04120
00039AI  0532                  426          CLAR  R3,R2              CANNOT BE < END           MDL04130
00039CI  2188                  427          BLS   MISERR             ATTEMPT TO LOAD OVER LOADER  MDL04140
00039EI  5830 898A =000D2CI    428 MISEND   LDA   R3,MISTRN          LOW IS > END OK           MDL04150
0003A2I  0303                  429          BR    R3                 RETURN                    MDL04160
0003A4I  5830 8970 =000D18I    430 PRGLOW   LDA   R3,HIGH            GET HIGH                  MDL04170
0003A8I  0532                  431          CLAR  R3,R2              IS IT < START ALSO        MDL04180
0003AAI  2086                  432          BLS   MISEND             YES, OK                   MDL04190
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0003ACI  C810 00DD              433  MISERR   LHI   R1,X'DD'          ATTEMPT TO LOAD OVER LOADER          MDL04200
0003B0I  4300 88A0 =000C54I     434           B     ERROR                                                  MDL04210
                                435  *   THIS ROUTINE WILL READ A SECTOR OF THE PROGRAM FROM THE DISC      MDL04220
                                436  *   INTO THE SPECIFIED BUFFER AREA, AND RETURN WITH THE SECTOR, HEAD, MDL04230
                                437  *   AND CYLINDER UPDATED TO THE NEXT AVAILABLE SECTOR                 MDL04240
                                438  *                                                                    MDL04250
                                439  *       INPUT :  R3 = RETURN ADDRESS                                 MDL04260
                                440  *                R8 = SECTOR TO BE READ                              MDL04270
                                441  *                RA = DEVICE ADDRESS                                 MDL04280
                                442  *                RB = SELCH ADDRESS                                  MDL04290
                                443  *                RC = CONTROLLER ADDRESS                             MDL04300
                                444  *              HEAD = CURRENT HEAD                                   MDL04310
                                445  *               CYL = CURRENT CYLINDER                               MDL04320
                                446  *                R5 = START OF BUFFER TO BE READ                     MDL04330
                                447  *                R6 = END OF BUFFER TO BE READ                       MDL04340
                                448  *                                                                    MDL04350
                                449  *       OUTPUT: R8 = NEW SECTOR NUMBER                               MDL04360
                                450  *                R5 = SAME                                           MDL04370
                                451  *         R6 = SAME                                                  MDL04380
                                452  *             HEAD = HEAD ASSOCIATED WITH THE NEXT SECTOR            MDL04390
                                453  *               CYL = CYL ASSOCIATED WITH THE NEXT SECTOR            MDL04400
                                454  *                                                                    MDL04410
      0000 03B4I                455  AVAILR   EQU   *                                                      MDL04420
0003B4I 5030 8980 =000D38I      456           STA   R3,AVARTN                                            MDL04430
0003B8I 4130 86E8 =000AA4I      457  AVAIL5   BAL   R3,WDFT                                              MDL04440
0003BCI DEA0 8946 =000D06I      458           OC    RA,SEEK                                              MDL04450
0003C0I 4130 870C =000AD0I      459           BAL   R3,FRSRW                                             MDL04460
0003C4I 4840 8986 =000D4EI      460           LH    R4,TRKDEN         LOAD TRKDEN                        MDL04470
0003C8I 4584 FF2E =0002FAI      461           CLH   R8,SECTAB(R4)     MAXIMUM ?                          MDL04480
*0003CCI 233C                   462           BE    AVAIL4A           YES                                MDL04490
0003CEI 4130 86D2 =000AA4I      463  AVAIL4   BAL   R3,WDFT                                              MDL04500
0003D2I 4130 871A =000AF0I      464           BAL   R3,RCHK           READ CHECK THE SECTOR              MDL04510
0003D6I 4830 897A =000D54I      465           LH    R3,CONSTA         IS THIS SECTOR                     MDL04520
0003DAI C330 0020               466           THI   R3,X'20'          DEFECTIVE                          MDL04530
0003DEI 4330 8032 =000414I      467           BZ    AVAIL1            NO                                 MDL04540
0003E2I 2681                    468           AIS   R8,1              NO - GET ANOTHER SECTOR            MDL04550
0003E4I 4584 FF12 =0002FAI      469  AVAIL4A  CLH   R8,SECTAB(R4)     MAXIMUM ?                          MDL04560
*0003E8I 203D                   470           BNE   AVAIL4                                               MDL04570
0003EAI 4830 8954 =000D42I      471           LH    R3,HEAD           NO - ANY ON THIS CYL ?             MDL04580
0003EEI 4534 FF00 =0002F2I      472           CLH   R3,HDTAB(R4)                                         MDL04590
*0003F2I 2337                   473           BE    AVAI00                                               MDL04600
0003F4I 2631                    474           AIS   R3,1              YES                                MDL04610
0003F6I 4030 8948 =000D42I      475           STH   R3,HEAD           INCREMENT HEAD                     MDL04620
0003FAI 0788                    476           XAR   R8,R8             ZERO SECTOR                        MDL04630
0003FCI 4300 FFCE =0003CEI      477           B     AVAIL4                                               MDL04640
000400I 4830 893C =000D40I      478  AVAI00   LH    R3,CYL            GET NEXT CYL #                     MDL04650
000404I 2631                    479           AIS   R3,1                                                 MDL04660
000406I 4030 8936 =000D40I      480  AVACON   STH   R3,CYL            SAVE NEW CYL VALUE                 MDL04670
00040AI 0788                    481           XAR   R8,R8             ZERO SECTOR                        MDL04680
00040CI 4080 8932 =000D42I      482           STH   R8,HEAD           ZERO OUT HEAD                      MDL04690
000410I 4300 FFA4 =0003B8I      483           B     AVAIL5            GO SEEK                            MDL04700
      0000 0414I                484  AVAIL1   EQU   *                                                    MDL04710
000414I 4130 868C =000AA4I      485           BAL   R3,WDFT                                              MDL04720
000418I 4130 806C =000488I      486           BAL   R3,RDISC          READ                               MDL04730
00041CI 2681                    487  AVACTN   AIS   R8,1                                                MDL04740
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00041EI  4840 892C =000D4EI     488           LH    R4,TRKDEN                                    MDL04750
000422I  4584 FED4 =0002FAI     489           CLH   R8,SECTAB(R4)                                MDL04760
000426I  2333                   490           BES   AVAIL6              YES                       MDL04770
000428I  4300 8024 =000450I     491           B     AVAEND              NO - RETURN               MDL04780
00042CI  4830 8912 =000D42I     492 AVAIL6    LH    R3,HEAD             INC. THE HEAD IF POSSIBLE MDL04790
000430I  4534 FEBE =0002F2I     493           CLH   R3,HDTAB(R4)                                 MDL04800
*000434I 2336                   494           BE    AVANCY              NOT POSSIBLE              MDL04810
000436I  2631                   495           AIS   R3,1                SET THE HEAD              MDL04820
000438I  4030 8906 =000D42I     496           STH   R3,HEAD             TO 1                      MDL04830
00043CI  0788                   497           XAR   R8,R8               SET SECTOR TO ZERO        MDL04840
00043EI  2309                   498           BS    AVAEND                                       MDL04850
000440I  4830 88FC =000D40I     499 AVANCY    LH    R3,CYL              GET THE CYLINDER VALUE    MDL04860
000444I  2631                   500           AIS   R3,1                                         MDL04870
000446I  4030 88F6 =000D40I     501 AVACY1    STH   R3,CYL              SAVE THE NEW CYLINDER     MDL04880
00044AI  0788                   502           XAR   R8,R8               ZERO OUT THE SECTOR       MDL04890
00044CI  4080 88F2 =000D42I     503           STH   R8,HEAD             ZERO OUT THE HEAD         MDL04900
000450I  5830 88E4 =000D38I     504 AVAEND    LDA   R3,AVARTN           GET THE RETURN ADDRESS    MDL04910
000454I  0303                   505           BR    R3                                           MDL04920
                                506 *   THIS ROUTINE WILL CALCULATE CHKSUM ON THE PROGRAM LOADED   MDL04930
                                507 *   INTO MEMORY, AND COMPARE IT TO THE CHKSUM BYTE IN THE PDB OF MDL04940
                                508 *   THE LOADED PROGRAM.                                        MDL04950
                                509 *                                                              MDL04960
                                510 *             IF CHKSUMS = X'FF' WILL BE DISPLAYED             MDL04970
                                511 *             IF CHKSUMS NOT = X'EE' WILL BE DISPLAYED         MDL04980
         0000 0456I             512 CHKSUM    EQU   *                   CALCULATE THE CHKSUM BYTE  MDL04990
000456I  2450                   513           LIS   R5,0                                           MDL05000
000458I  5840 8888 =000D14I     514           LDA   R4,LOW                                         MDL05010
00045CI  D324 0000              515 CHK1      LB    R2,0(R4)            GET A BYTE                 MDL05020
000460I  0752                   516           XAR   R5,R2               X OR INTO CHKSUM BYTE      MDL05030
000462I  2641                   517           AIS   R4,1                BUMP POINTER               MDL05040
000464I  5540 8880 =000D18I     518           CLA   R4,HIGH             = MAX ?                    MDL05050
000468I  2086                   519           BLS   CHK1                NO                         MDL05060
00046AI  D324 0000              520           LB    R2,0(R4)            YES - X OR LAST BYTE       MDL05070
00046EI  0752                   521           XAR   R5,R2               R5 = CHKSUM                MDL05080
000470I  D320 8908 =000D7CI     522           LB    R2,PDB+24           GET THE BYTE FROM THE PDB  MDL05090
000474I  0552                   523           CLAR  R5,R2               CHKSUM OK ?                MDL05100
000476I  2135                   524           BNES  CHKERR              NO                         MDL05110
000478I  C810 00FF              525 NORTRM    LHI   R1,X'FF'            YES - DISPLAY FF           MDL05120
00047CI  4300 87D4 =000C54I     526           B     ERROR               NORMAL TERMINATION         MDL05130
000480I  C810 00EE              527 CHKERR    LHI   R1,X'EE'            CHKSUM ERROR               MDL05140
000484I  4300 87CC =000C54I     528           B     ERROR               TERMINATION                MDL05150
                                529 *  R E A D                                                     MDL05160
                                530 *   ENTRY POINT          OPERATION                             MDL05170
                                531 *                                                              MDL05180
                                532 *       RDISC . . . . . .THIS ROUTINE PERFORM A READ OF ONE    MDL05190
                                533 *                        SECTOR FROM THE DISC.                 MDL05200
                                534 *                                                              MDL05210
                                535 *       READPB . . . . . THIS ENTRY WILL READ ONE RECORD FROM  MDL05220
                                536 *                        MAG TAPE.                             MDL05230
                                537 *                                                              MDL05240
                                538 *       INPUT : R3 = RETURN ADDRESS                            MDL05250
                                539 *               R5 = LOW ADDRESS OF THE BUFFER TO BE READ      MDL05260
                                540 *               R6 = HIGH ADDRESS OF THE BUFFER TO BE READ     MDL05270
                                541 *               RA = DEVICE ADDRESS                            MDL05280
                                542 *               RB = SELCH ADDRESS (IF ANY)                    MDL05290
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                             543  *              RC = CONTROLLER ADDRESS (IF ANY)                       MDL05300
                             544  *              R1 = EOV RETURN (IF A MAG TAPE READ)                   MDL05310
                             545  *                                                                     MDL05320
                             546  *         OUTPUT: R5 = SAME                                           MDL05330
                             547  *                 RA = SAME                                           MDL05340
                             548  *                 RB = SAME                                           MDL05350
                             549  *                 RC = SAME                                           MDL05360
                             550  *                                                                     MDL05370
                             551  *         REGISTERS USED:                                             MDL05380
                             552  *                                                                     MDL05390
                             553  *              R1                                                     MDL05400
                             554  *              R2                                                     MDL05410
                             555  *              DESIGNATED BUFFER AREA CONTAINS THE DATA               MDL05420
                             556  *              READ FROM THE MEDIA.                                   MDL05430
                             557  *                                                                     MDL05440
                             558  *                                                                     MDL05450
          0000 0488I         559  RDISC    EQU   *                                                      MDL05460
000488I   5030 8890 =000D1CI 560           STA   R3,WRTEND                                              MDL05470
00048CI   2435               561           LIS   R3,5          SET THE RETRY COUNT                      MDL05480
00048EI   4030 88CA =000D5CI 562           STH   R3,RETRY                                               MDL05490
000492I   243F               563           LIS   R3,15         SET THE DISC INDICATOR                   MDL05500
000494I   4030 88BA =000D52I 564           STH   R3,RWDEV                                               MDL05510
000498I   4300 8054 =0004F0I 565           B     DISC                                                   MDL05520
          0000 049CI         566  READPB   EQU   *                                                      MDL05530
00049CI   5030 887C =000D1CI 567           STA   R3,WRTEND                                              MDL05540
0004A0I   5010 887C =000D20I 568           STA   R1,EOVRTN     SAVE THE EOV BRANCH ADD.                 MDL05550
0004A4I   2415               569           LIS   R1,5          SET THE WRITE RETRY COUNTER              MDL05560
0004A6I   4010 88B2 =000D5CI 570           STH   R1,RETRY      TO FIVE                                  MDL05570
0004AAI   2430               571           LIS   R3,0          SET THE MAG TAPE INDICATOR               MDL05580
0004ACI   4030 88A2 =000D52I 572           STH   R3,RWDEV                                               MDL05590
0004B0I   D330 0079          573           LB    R3,X'79'      READ COMMAND                  R05
0004B4I   C530 00A1          574           CLHI  R3,X'A1'      NORMAL I/F?                   R05
0004B8I   2334               575           BES   MT6253        YES, SKIP                     R05
0004BAI   DEA0 8852 =000D10I 576           OC    RA,DISAB625   DISABLE 6250 I/F              R05
0004BEI   2303               577           BS    MT6254        CONTINUE                      R05
0004C0I   DEA0 8838 =000CFCI 578  MT6253   OC    RA,DISABL     DISABLE I/F                   R05
          0000 04C4I         579  MT6254   EQU   *             R05
0004C4I   08BB               580  MTRY     LDAR  RB,RB         SELCH ?                                  MDL05610
0004C6I   4230 8026 =0004F0I 581           BNZ   SELWRT                                                 MDL05620
0004CAI   2430               582           LIS   R3,0          NO                                       MDL05630
0004CCI   4030 8886 =000D56I 583           STH   R3,SELERR     ZERO OUT THE SELCH ERROR FLAG            MDL05640
0004D0I   D320 0079          584           LB    R2,X'79'      READ COMMAND FOR EITHER I/F   R05
0004D4I   9EA2               585           OCR   RA,R2         OUTPUT THE READ COMMAND                  MDL05660
0004D6I   9DA7               586  SRB      SSR   RA,R7         SENSE STATUS                             MDL05670
0004D8I   2081               587           BTBS  8,1           WAIT FOR BUSY NOT                        MDL05680
0004DAI   DBA5 0000          588           RD    RA,0(R5)      READ DATA                                MDL05690
0004DEI   2651               589           AIS   R5,1          BUMP                                     MDL05700
0004E0I   0556               590           CLAR  R5,R6         DONE??                                   MDL05710
*0004E2I  2086               591           BC    SRB           NO, LOOP                                 MDL05720
*0004E4I  2237               592           BE    SRB           NO, LOOP                                 MDL05730
0004E6I   9DA7               593           SSR   RA,R7         SENSE STATUS                             MDL05740
0004E8I   4270 8084 =000570I 594           BTC   7,MTERR       ERROR                                    MDL05750
0004ECI   4300 805A =00054AI 595           B     CONMT1                                                 MDL05760
          0000 04F0I         596  DISC     EQU   *                                                      MDL05770
0004F0I   DEB0 8810 =000D04I 597  SELWRT   OC    RB,STOP       STOP THE SELCH                           MDL05780
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0004F4I                                  IFZ   ADC-4          *                             R05
0004F4I  3425                            EXHR  R2,R5          MS START ADDRESS DOWN         R05
0004F6I  3436                            EXHR  R3,R6          MS END ADDRESS DOWN           R05
0004F8I  9AB2                            WDR   RB,R2          WRITE THE FIRST BYTE                MDL05910
                                         ENDC                 *                             R05
0004FAI  98B5                   CONT4B   WHR   RB,R5          WRITE THE 2ND + 3RD BYTES           MDL05920
0004FCI                                  IFZ   ADC-4          *                             R05
0004FCI  9AB3                            WDR   RB,R3          WRITE THE 4TH BYTE                  MDL05950
                                         ENDC                 *                             R05
0004FEI  98B6                   CONT4C   WHR   RB,R6          WRITE THE 5TH & 6TH BYTES           MDL05960
000500I  5050 8820 =000D24I              STA   R5,STADD       SAVE THE START ADDRESS.             MDL05970
000504I  5060 8820 =000D28I              STA   R6,FADD        SAVE THE END ADDRESS                MDL05980
000508I  4820 8846 =000D52I              LH    R2,RWDEV                                           MDL06000
00050CI  4230 80B4 =0005C4I              BNZ   SELDIS                                             MDL06010
000510I  D310 0079                       LB    R1,X'79'       READ COMMAND FOR EITHER I/F     R05
000514I  9EA1                            OCR   RA,R1          OUTPUT THE MAG TAPE READ COMMAND    MDL06050
000516I                                  IFZ   ADC-4          *                             R05
000516I  DEB0 87F0 =000D0AI              OC    RB,ESREAD      GIVE THE ESELCH READ COMMAND        MDL06060
                                         ELSE                 *                             R05
                                         OC    RB,SREAD       GIVE SELCH READ COMMAND             MDL06100
                                         ENDC                 *                             R05
00051AI  2400                            LIS   R0,0                                               MDL06120
00051CI  4000 8836 =000D56I              STH   R0,SELERR                                          MDL06130
         0000 0520I             CONT5B   EQU   *                                                  MDL06140
000520I  9DB0                            SSR   RB,R0          SENSE STATUS                        MDL06150
000522I  2081                            BTBS  8,1            WAIT FOR BUSY NOT                   MDL06160
000524I  2460                            LIS   R6,0           *                             R05
000526I                                  IFNZ  ADC-2                                              MDL06170
000526I  DEB0 87DB =000D05I              OC    RB,ESTOP       GIVE THE ESELCH STOP COMMAND        MDL06210
00052AI  9BB6                            RDR   RB,R6          3 - READ THE MOST SIG. BYTE         MDL06280
00052CI  3466                            EXHR  R6,R6          LEFT 16                       R05
                                         ELSE                 *                             R05
                                         OC    RB,STOP        STOP THE SELCH                R05
                                         ENDC                 *                             R05
00052EI  2470                   SELIN2   LIS   R7,0                                               MDL06310
000530I  99B7                            RHR   RB,R7          READ A HALFWORD                     MDL06320
000532I  0667                            OAR   R6,R7          R6 = FINAL ADDRESS                  MDL06330
000534I  5870 87F0 =000D28I              LDA   R7,FADD        GET THE FINAL ADDRESS               MDL06340
000538I  0576                            CLAR  R7,R6          COMPARE THE ADDRESSES               MDL06350
*00053AI 2135                            BNE   SELIN9                                             MDL06360
00053CI  2400                            LIS   R0,0                                               MDL06370
00053EI  4000 8814 =000D56I              STH   R0,SELERR      SET NO SELCH ERROR                  MDL06380
*000542I 2304                            B     CONMT1         CONTINUE                            MDL06390
000544I  240F                   SELIN9   LIS   R0,15          SET SELCH                           MDL06400
000546I  4000 880C =000D56I              STH   R0,SELERR      ERROR                               MDL06410
00054AI  9DA1                   CONMT1   SSR   RA,R1          NO - THE MAGTAPE                    MDL06530
00054CI  C310 0010                       THI   R1,X'10'       WAIT FOR NO MOTION                  MDL06540
000550I  2203                            BZS   CONMT1                                             MDL06550
         0000 0552I             CONMT9   EQU   *                                                  MDL06560
000552I  D330 0079                       LB    R3,X'79'       READ COMMAND USED             R05
000556I  C530 00A1                       CLHI  R3,X'A1'       NORMAL I/F?                   R05
00055AI  2334                            BES   MT6255         YES, BRANCH                   R05
00055CI  C310 00C2                       THI   R1,X'C2'       ANY ERRORS?                   R05
*000560I 2303                            B     MT6256         SKIP TO TEST                  R05
000562I  C310 00C0              MT6255   THI   R1,X'C0'       ANY ERRORS?                   R05
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          0000 0566I          MT6256   EQU   *              *                                  R05
000566I   2135                         BNZS  MTERR          YES - TRY TO RECOVER                     MDL06580
000568I   4830 87EA =000D56I           LH    R3,SELERR      NO - SELCH ERROR ?                       MDL06590
00056CI   4330 804A =0005BAI           BZ    MTEND                                                   MDL06600
          0000 0570I          MTERR    EQU   *                                                       MDL06610
000570I   9DA1                         SSR   RA,R1                                                   MDL06620
000572I   C310 0010                    THI   R1,X'10'                                                MDL06630
000576I   2233                         BZS   MTERR                                                   MDL06640
000578I   9DA1                         SSR   RA,R1          YES - CHECK FOR EOF.                     MDL06650
00057AI   C310 0040                    THI   R1,X'40'       EOF ?                                    MDL06660
00057EI   2334                         BZS   MTERRW         NO                                       MDL06670
000580I   5830 879C =000D20I           LDA   R3,EOVRTN      YES - TAKE THE EOF RETURN                MDL06680
000584I   0303                         BR    R3                                                      MDL06690
000586I   4830 87D2 =000D5CI  MTERRW   LH    R3,RETRY       TRY TO RECOVER                           MDL06700
00058AI   2135                         BNZS  MTERR1                                                  MDL06710
00058CI   C810 00E3                    LHI   R1,X'E3'       RECOVERY UNSUCCESSFUL                    MDL06720
000590I   4300 860C =000C70I           B     ERRA                                                    MDL06730
000594I   2731                MTERR1   SIS   R3,1                                                    MDL06740
000596I   4030 87C2 =000D5CI           STH   R3,RETRY                                                MDL06750
00059AI   4100 84F2 =000A90I           BAL   R0,NOMOTN      WAIT FOR NO MOTION                       MDL06760
00059EI   D300 0079                    LB    R0,X'79'       READ COMMAND                       R05
0005A2I   C500 00A1                    CLHI  R0,X'A1'       NORMAL I/F?                        R05
0005A6I   2334                         BES   MT6259         YES, SKIP                          R05
0005A8I   DEA0 8767 =000D13I           OC    RA,BKSP625     BACKSPACE RECORD                   R05
0005ACI   2303                         BS    MT625A         CONTINUE                           R05
0005AEI   DEA0 8755 =000D07I  MT6259   OC    RA,BKSP        BACKSPACE RECORD                   R05
          0000 05B2I          MT625A   EQU   *              R05
0005B2I   4100 84DA =000A90I           BAL   R0,NOMOTN      WAIT FOR NO MOTION                       MDL06780
0005B6I   4300 FF0A =0004C4I           B     MTRY                                                    MDL06790
          0000 05BAI          MTEND    EQU   *                                                       MDL06800
0005BAI   DEB0 8746 =000D04I           OC    RB,STOP        STOP SELCH                               MDL06810
0005BEI   5830 875A =000D1CI           LDA   R3,WRTEND                                               MDL06820
0005C2I   0303                         BR    R3                                                      MDL06830
0005C4I   9DC1                SELDIS   SSR   RC,R1          WAIT                                     MDL06840
0005C6I   2221                         BFBS  2,SELDIS       CONTROLLER IDLE                          MDL06850
0005C8I   4130 84D8 =000AA4I           BAL   R3,WDFT                                                 MDL06860
0005CCI   4870 877E =000D4EI           LH    R7,TRKDFN                                               MDL06870
0005D0I   2772                         SIS   R7,2           TEST IF 10 MB                      R05
*0005D2I  233B                         BZ    SELD3          *                                  R05   MDL06890
0005D4I   9AC8                         WDR   RC,R8          WRITE SECTOR                             MDL06900
0005D6I   4870 8768 =000D42I           LH    R7,HEAD                                                 MDL06910
0005DAI   117A                         SLLS  R7,10          SCALE                                    MDL06920
0005DCI   4670 8760 =000D40I           OH    R7,CYL         MERGE HEAD AND CYLINDER INFO       R05   MDL06930
0005E0I   98C7                         WHR   RC,R7          SEND TO CONTROLLER                       MDL06950
0005E2I   9DC7                         SSR   RC,R7                                                   MDL06960
0005E4I   2221                         BFBS  2,1            WAIT FOR CONTROLLER IDLE                 MDL06970
*0005E6I  2306                         B     SELD2                                                   MDL06980
0005E8I   4810 8756 =000D42I  SELD3    LH    R1,HEAD                                                 MDL06990
0005ECI   1115                         SLLS  R1,5           POSITION THE HEAD BIT                    MDL07000
0005EEI   0618                         OAR   R1,R8          COMBINE WITH SECTOR NUMBER               MDL07010
0005F0I   9AC1                         WDR   RC,R1          SET UP THE HEADER                        MDL07020
          0000 05F2I          SELD2    EQU   *              *                                  R05
0005F2I   D310 870D =000D03I           LB    R1,DREAD       EXTENDED SELCH COMMANDS                  MDL07060
0005F6I   9EC1                         OCR   RC,R1          START DISK READ                          MDL07070
0005F8I                                IFZ   ADC=4          *                                  R05
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 0005F8I  DEB0 870E =000D0AI   708           OC    RB,ESREAD        START THE ESELCH READ               MDL07080
                               709           ELSE                   *                              R05
                               710           OC    RB,SREAD         START THE SELCH                R05
                               711           ENDC                   *                              R05
 0005FCI  2400                 712           LIS   R0,0                                                  MDL07150
 0005FEI  4000 8754 =000D56I   713           STH   R0,SELERR                                             MDL07160
 000602I  9DB0                 714           SSR   RB,R0            SENSE STATUS                         MDL07170
 000604I  2081                 715           BTBS  8,1              WAIT FOR BUSY NOT                    MDL07180
 000606I  2460                 716           LIS   R6,0             *                              R05
 000608I                       717           IFNZ  ADC-2                                                 MDL07190
 000608I  DEB0 86F9 =000D05I   718           OC    RB,ESTOP         GIVE THE ESELCH STOP COMMAND         MDL07230
 00060CI  9BB6                 719           RDR   RB,R6            3 - READ THE MOST SIG. BYTE          MDL07300
 00060EI  3466                 720           EXHR  R6,R6            LEFT 16                        R05
                               721           ELSE                   *                              R05
                               722           OC    RB,STOP          STOP THE SELCH                 R05
                               723           ENDC                   *                              R05
 000610I  2470                 724  SELIN2D  LIS   R7,0                                                  MDL07330
 000612I  99B7                 725           RHR   RB,R7            READ A HALFWORD                      MDL07340
 000614I  0667                 726           OAR   R6,R7            R6 = FINAL ADDRESS                   MDL07350
 000616I  5870 870E =000D28I   727           LDA   R7,FADD          GET THE FINAL ADDRESS                MDL07360
 00061AI  0576                 728           CLAR  R7,R6            COMPARE THE ADDRESSES                MDL07370
*00061CI  2132                 729           BNE   SELIN9D                                               MDL07380
*00061EI  2304                 730           B     CONDS1           CONTINUE                             MDL07390
 000620I  240F                 731  SELIN9D  LIS   R0,15            SET SELCH                            MDL07400
 000622I  4000 8730 =000D56I   732           STH   R0,SELERR        ERROR                                MDL07410
 000626I  4130 850A =000B34I   733  CONDS1   BAL   R3,SETCON                                             MDL07530
 00062AI  4810 8726 =000D54I   734  CONDS3   LH    R1,CONSTA                                             MDL07540
 00062EI  C310 0001            735           THI   R1,X'01'         CONTROLLER ERROR                     MDL07550
 000632I  2134                 736           BNZS  DSCERR                                                MDL07560
 000634I  4810 871E =000D56I   737           LH    R1,SELERR                                             MDL07570
*000638I  233D                 738           BZ    DSCEND                                                MDL07580
 00063AI  4830 871E =000D5CI   739  DSCERR   LH    R3,RETRY         TRY TO RECOVER                       MDL07590
 00063EI  2135                 740           BNZS  DSERR1                                                MDL07600
 000640I  C810 00E3            741           LHI   R1,X'E3'         RECOVERY UNSUCCESSFUL                MDL07610
 000644I  4300 8628 =000C70I   742           B     ERRA                                                  MDL07620
 000648I  2731                 743  DSERR1   SIS   R3,1                                                  MDL07630
 00064AI  4030 870E =000D5CI   744           STH   R3,RETRY                                              MDL07640
 00064EI  4300 FE9E =0004F0I   745           B     SELWRT                                                MDL07650
 000652I  4130 847A =000AD0I   746  DSCEND   BAL   R3,FRSRW         WAIT FOR DISC ADD. INTERLOCK         MDL07660
 000656I  DEB0 86AA =000D04I   747           OC    RB,STOP          STOP  SELCH                          MDL07670
 00065AI  5830 86BE =000D1CI   748           LDA   R3,WRTEND                                             MDL07680
 00065EI  0303                 749           BR    R3                                                    MDL07690
          0000 0660I           750  LIST     EQU   *                                                     MDL07700
 000660I  0722                 751           XAR   R2,R2            ZERO LINE COUNT                      MDL07710
 000662I  4020 86F2 =000D58I   752           STH   R2,LINCNT                                             MDL07720
 000666I  E630 8008 =000672I   753           LDAI  R3,STPRIN        SAVE RETURN                          MDL07730
 00066AI  5030 83DE =000A4CI   754           STA   R3,FMTRTN        DO A CR - LF                         MDL07740
 00066EI  4300 81CE =000840I   755           B     LINEND                                                MDL07750
          0000 0672I           756  STPRIN   EQU   *                                                     MDL07760
 000672I  C800 0047            757           LHI   R0,71            PRINT THE HEADER                     MDL07770
 000676I  E670 837E =0009F8I   758           LDAI  R7,HEADER                                             MDL07780
 00067AI  4130 82E0 =00095EI   759           BAL   R3,PRINT                                              MDL07790
 00067EI  E630 8008 =00068AI   760           LDAI  R3,PRNTTL                                             MDL07800
 000682I  5030 83C6 =000A4CI   761           STA   R3,FMTRTN                                             MDL07810
 000686I  4300 81B6 =000840I   762           B     LINEND                                                MDL07820
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         0000 068AI             763  PRNTTL   EQU   *                                                          MDL07830
00068AI  4840 007A              764           LH    R4,X'7A'           LIST OF MAG TAPE ?                      MDL07840
00068EI  4230 8044 =0006D6I     765           BNZ   LSTDIS             NO - DISC                               MDL07850
000692I  D300 0079              766           LB    R0,X'79'           READ COMMAND                    R05
000696I  C500 00A1              767           CLHI  R0,X'A1'           NORMAL I/F?                     R05
00069AI  2334                   768           BES   MT625B             YES, SKIP                       R05
00069CI  DEA0 8671 =000D11I     769           OC    RA,CLEAR625        CLEAR 6250 I/F                  R05
0006A0I  2303                   770           BS    LISMT1             CONTINUE                        R05
0006A2I  DEA0 8657 =000CFDI     771  MT625B   OC    RA,CLEAR           CLEAR CONTROLLER                R05
0006A6I  D300 0079              772  LISMT1   LB    R0,X'79'           READ COMMAND                    R05
0006AAI  C500 00A1              773           CLHI  R0,X'A1'           NORMAL I/F?                     R05
0006AEI  2334                   774           BES   MT625C             YES, SKIP                       R05
0006B0I  DEA0 865E =000D12I     775           OC    RA,FWFM625         FORWARD FILE MARK               R05
0006B4I  2303                   776           BS    MT625D             CONTINUE                        R05
0006B6I  DEA0 8646 =000D00I     777  MT625C   OC    RA,FWFM            FORWARD FILE MARK               R05
         0000 06BAI             778  MT625D   EQU   *                  *                               R05     MDL07880
0006BAI  4100 83D2 =000A90I     779           BAL   R0,NOMOTN                                                  MDL07890
0006BEI  E650 86A2 =000D64I     780           LDAI  R5,PDB                                                     MDL07900
0006C2I  E660 86D1 =000D97I     781           LDAI  R6,PDB+51                                                  MDL07910
0006C6I  E610 FDAE =000478I     782           LDAI  R1,NORTRM          END IF EOV                              MDL07920
0006CAI  4130 FDCE =00049CI     783           BAL   R3,READPB          GO READ                                 MDL07930
0006CEI  4130 80BE =000790I     784           BAL   R3,FORMAT                                                  MDL07940
0006D2I  4300 FFD0 =0006A6I     785           B     LISMT1                                                     MDL07950
         0000 06D6I             786  LSTDIS   EQU   *                  LIST THE DISC                           MDL07960
0006D6I  4130 83F6 =000AD0I     787           BAL   R3,FRSRW                                                   MDL07970
0006DAI  D330 F92C =00000AI     788           LB    R3,SOD             GET START                               MDL07980
0006DEI  4030 865E =000D40I     789           STH   R3,CYL             SET CYL TO ONE                          MDL07990
0006E2I  0788                   790           XAR   R8,R8              SET SECTOR TO ZERO                      MDL08000
0006E4I  4080 865A =000D42I     791           STH   R8,HEAD            SET HEAD TO ZERO                        MDL08010
0006E8I  4130 83B8 =000AA4I     792  LSTDS0   BAL   R3,WDFT                                                    MDL08020
0006ECI  DEA0 8619 =000D09I     793           OC    RA,RESTOR          RESTORE THE FILE                        MDL08030
0006F0I  4130 83DC =000AD0I     794           BAL   R3,FRSRW                                                   MDL08040
0006F4I  E650 86A0 =000D98I     795           LDAI  R5,DIRECT                                                  MDL08050
0006F8I  E660 879B =000E97I     796           LDAI  R6,DIRECT+255                                              MDL08060
0006FCI  4130 FCB4 =0003B4I     797           BAL   R3,AVAILR          READ THE DIRECTORY                      MDL08070
000700I  4080 8350 =000A54I     798           STH   R8,DIRPRM          SAVE THE PARAMETERS FOR                 MDL08080
000704I  4880 8638 =000D40I     799           LH    R8,CYL             THE NEXT SECTOR                         MDL08090
000708I  4080 834A =000A56I     800           STH   R8,DIRPRM+2        OF DIRECTORY.                           MDL08100
00070CI  4880 8632 =000D42I     801           LH    R8,HEAD                                                    MDL08110
000710I  4080 8344 =000A58I     802           STH   R8,DIRPRM+4                                                MDL08120
000714I  0722                   803           XAR   R2,R2              ZERO POINTER                            MDL08130
000716I  4832 8680 =000D9AI     804  LSTDS1   LH    R3,DIRECT+2(R2)    GET THE THIRD DIGIT OF THE NUMBER       MDL08140
00071AI  4330 FD5A =000478I     805           BZ    NORTRM             = ZERO ? - YES END                      MDL08150
00071EI  C530 EEEE              806           CLHI  R3,X'EEEE'         IS IT THE KNOWN INFO. INDICATOR ?       MDL08160
000722I  4330 8040 =000766I     807           BE    LSTXYZ             YES                                     MDL08170
000726I  4882 8672 =000D9CI     808           LH    R8,DIRECT+4(R2)    NO - LIST                               MDL08180
00072AI  4080 8612 =000D40I     809           STH   R8,CYL                                                     MDL08190
00072EI  D382 866C =000D9EI     810           LB    R8,DIRECT+6(R2)                                            MDL08200
000732I  D332 8669 =000D9FI     811           LB    R3,DIRECT+7(R2)                                            MDL08210
000736I  4030 8608 =000D42I     812           STH   R3,HEAD                                                    MDL08220
00073AI  4020 831C =000A5AI     813           STH   R2,DIRPRM+6        SAVE R2                                 MDL08230
00073EI  4130 838E =000AD0I     814           BAL   R3,FRSRW           WAIT                                    MDL08240
000742I  4130 835E =000AA4I     815           BAL   R3,WDFT            SET UP FILE                             MDL08250
000746I  DEA0 85BC =000D06I     816           OC    RA,SEEK            SEEK                                    MDL08260
00074AI  4130 8382 =000AD0I     817           BAL   R3,FRSRW           WAIT
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00074EI  E650 8612 =000D64I   818          LDAI  R5,PDB                                               MDL08270
000752I  E660 8641 =000D97I   819          LDAI  R6,PDB+51                                            MDL08280
000756I  4130 834A =000AA4I   820          BAL   R3,WDFT                                              MDL08290
00075AI  4130 FD2A =000488I   821          BAL   R3,RDISC        READ PDB                             MDL08300
00075EI  4130 802E =000790I   822          BAL   R3,FORMAT                                            MDL08310
000762I  4820 82F4 =000A5AI   823          LH    R2,DIRPRM+6     RESTORE R2                           MDL08320
000766I  2628                 824 LSTXYZ   AIS   R2,8                                                 MDL08330
000768I  C520 0100            825          CLHI  R2,X'100'       = MAX ?                              MDL08340
00076CI  4230 FFA6 =000716I   826          BNE   LSTDS1          NO - MORE PROGS. THIS SECTOR         MDL08350
000770I  4880 82E2 =000A56I   827          LH    R8,DIRPRM+2     YES - READ ANOTHER DIRECTORY SECTOR. MDL08360
000774I  D480 F893 =00000BI   828          CLB   R8,SOP          DONE??                               MDL08370
000778I  4380 FCFC =000478I   829          BNL   NORTRM          YES                                  MDL08380
00077CI  4080 85C0 =000D40I   830          STH   R8,CYL          RESTORE . .                          MDL08390
000780I  4880 82D4 =000A58I   831          LH    R8,DIRPRM+4     CYL                                  MDL08400
000784I  4080 85BA =000D42I   832          STH   R8,HEAD         HEAD                                 MDL08410
000788I  4880 82C8 =000A54I   833          LH    R8,DIRPRM       SECTOR   FOR THE NEXT SECTOR         MDL08420
00078CI  4300 FF58 =0006E8I   834          B     LSTDS0                                               MDL08430
         0000 0790I           835 FORMAT   EQU   *                                                    MDL08440
000790I  5030 82B8 =000A4CI   836          STA   R3,FMTRTN       SAVE RETURN                          MDL08450
000794I  2402                 837          LIS   R0,2            PRINT 2 SPACES                       MDL08460
000796I  E670 82AA =000A44I   838          LDAI  R7,SPACE                                             MDL08470
00079AI  4130 81C0 =00095EI   839          BAL   R3,PRINT                                             MDL08480
00079EI  2403                 840          LIS   R0,3                                                 MDL08490
0007A0I  E670 85C0 =000D64I   841          LDAI  R7,PDB                                               MDL08500
0007A4I  4130 81B6 =00095EI   842          BAL   R3,PRINT                                             MDL08510
0007A8I  2405                 843          LIS   R0,5            PRINT 5 SPACES                       MDL08520
0007AAI  E670 8296 =000A44I   844          LDAI  R7,SPACE                                             MDL08530
0007AEI  4130 81AC =00095EI   845          BAL   R3,PRINT                                             MDL08540
0007B2I  2403                 846          LIS   R0,3            PRINT THE 06 - #                     MDL08550
0007B4I  E670 85AF =000D67I   847          LDAI  R7,PDB+3                                             MDL08560
0007B8I  4130 81A2 =00095EI   848          BAL   R3,PRINT                                             MDL08570
0007BCI  2405                 849          LIS   R0,5            PRINT 5 SPACES                       MDL08580
0007BEI  E670 8282 =000A44I   850          LDAI  R7,SPACE                                             MDL08590
0007C2I  4130 8198 =00095EI   851          BAL   R3,PRINT                                             MDL08600
0007C6I  2402                 852          LIS   R0,2                                                 MDL08610
0007C8I  E670 859E =000D6AI   853          LDAI  R7,PDB+6                                             MDL08620
0007CCI  4130 818E =00095EI   854          BAL   R3,PRINT                                             MDL08630
0007D0I  D300 85A9 =000D7DI   855          LB    R0,PDB+25       LOAD EXTENSION                       MDL08640
0007D4I  C500 002E            856          CLHI  R0,C'.'         EXISTS?                              MDL08650
*0007D8I 2138                 857          BNE   FORMAT1         NO                                   MDL08660
0007DAI  2402                 858          LIS   R0,2            SET COUNT                            MDL08670
0007DCI  E670 859D =000D7DI   859          LDAI  R7,PDB+25       SET START                            MDL08680
0007E0I  4130 817A =00095EI   860          BAL   R3,PRINT                                             MDL08690
0007E4I  2402                 861          LIS   R0,2            PRINT ONLY 2 SPACES                  MDL08700
*0007E6I 2302                 862          B     FORMAT2                                              MDL08710
0007E8I  2404                 863 FORMAT1  LIS   R0,4            PRINT 4 SPACES                       MDL08720
0007EAI  E670 8256 =000A44I   864 FORMAT2  LDAI  R7,SPACE                                             MDL08730
0007EEI  4130 816C =00095EI   865          BAL   R3,PRINT                                             MDL08740
0007F2I  240A                 866          LIS   R0,10           PRINT THE NAME                       MDL08750
0007F4I  E670 8574 =000D6CI   867          LDAI  R7,PDB+8                                             MDL08760
0007F8I  4130 8162 =00095EI   868          BAL   R3,PRINT                                             MDL08770
0007FCI  C800 0014            869          LHI   R0,20           PRINT THE REST OF THE NAME           MDL08780
000800I  E670 857E =000D82I   870          LDAI  R7,PDB+30                                            MDL08790
000804I  4130 8156 =00095EI   871          BAL   R3,PRINT                                             MDL08800
000808I  2404                 872          LIS   R0,4            PRINT 4 SPACES                       MDL08810
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00080AI  E670 8236 =000A44I            LDAI  R7,SPACE                                 MDL08830
00080EI  4130 814C =00095EI            BAL   R3,PRINT                                 MDL08840
000812I  E610 8560 =000076I            LDAI  R1,PDB+18                                MDL08850
000816I  4130 80FE =000918I            BAL   R3,SEQASC                                MDL08860
00081AI  2405                          LIS   R0,5                                     MDL08870
00081CI  E670 853E =000D5EI            LDAI  R7,ASCSEQ                                MDL08880
000820I  4130 813A =00095EI            BAL   R3,PRINT                                 MDL08890
000824I  2403                          LIS   R0,3       PRINT 3 SPACES                MDL08900
000826I  E670 821A =000A44I            LDAI  R7,SPACE                                 MDL08910
00082AI  4130 8130 =00095EI            BAL   R3,PRINT                                 MDL08920
00082EI  E610 8547 =000079I            LDAI  R1,PDB+21                                MDL08930
000832I  4130 80E2 =000918I            BAL   R3,SEQASC                                MDL08940
000836I  2405                          LIS   R0,5                                     MDL08950
000838I  E670 8522 =000D5EI            LDAI  R7,ASCSEQ                                MDL08960
00083CI  4130 811E =00095EI            BAL   R3,PRINT                                 MDL08970
         0000 0840I           LINEND   EQU   *                                        MDL08980
000840I  D320 F7C2 =000006I            LB    R2,LPAD    LOAD ADDRESS                  MDL08990
000844I  9023                          SSR   R2,R3      SENSE STATUS                  MDL09000
*000846I 2159                          BTC   5,PRNTLN   NOT LINE PRINTER              MDL09010
000848I  2402                          LIS   R0,2       YES                           MDL09020
00084AI  E670 81F4 =000A42I            LDAI  R7,LINECR                                MDL09030
00084EI  4130 810C =00095EI            BAL   R3,PRINT                                 MDL09040
000852I  5830 81F6 =000A4CI   FMTEND   LDA   R3,FMTRTN                                MDL09050
000856I  0303                          BR    R3                                       MDL09060
000858I  2402                 PRNTLN   LIS   R0,2                                     MDL09070
00085AI  E670 81E2 =000A40I            LDAI  R7,CRLF                                  MDL09080
00085EI  4130 80FC =00095EI            BAL   R3,PRINT                                 MDL09090
000862I  4830 84F2 =000D58I            LH    R3,LINCNT  YES                           MDL09100
000866I  C530 0016                     CLHI  R3,22      LINE COUNT = MAX ?            MDL09110
00086AI  2336                          BES   LINWT                                    MDL09120
00086CI  2631                          AIS   R3,1                                     MDL09130
00086EI  4030 84E6 =000D58I            STH   R3,LINCNT                                MDL09140
000872I  4300 FFDC =000852I            B     FMTEND                                   MDL09150
         0000 0876T           LINWT    EQU   *                                        MDL09160
000876I  4830 F78A =000004I            LH    R3,DISFLG  GET FLAG                      MDL09170
00087AI  4230 802E =0008ACI            BNZ   LINWTD     USE DISPLAY                   MDL09180
00087EI  C800 002B                     LHI   R0,43      LOAD COUNT                    MDL09190
000882I  E670 8066 =0008ECI            LDAI  R7,MSGCON  LOAD START ADDRESS            MDL09200
000886I  4130 80D4 =00095EI            BAL   R3,PRINT   PRINT MESSAGE                 MDL09210
000886I                                IFZ   ADC-2                                    MDL09220
                                       LHI   R3,MBRD    LOAD COMMAND                  MDL09230
                                       ELSE                                           MDL09240
00088AI  C830 00A1                     LHI   R3,PASRD   LOAD COMMAND                  MDL09250
                                       ENDC                                           MDL09260
00088EI  9E23                          OCR   R2,R3      ISSUE COMMAND                 MDL09270
000890I  9023                 LINWTND  SSR   R2,R3      SENSE STATUS                  MDL09280
000892I  2081                          BTBS  8,1        WAIT FOR BUSY NOT             MDL09290
000894I  9B23                          RDR   R2,R3      READ CHARACTER                MDL09300
000896I  9A23                          WDR   R2,R3      ECHO                          MDL09310
000898I  C530 000A                     CLHI  R3,X'0A'   LF??                          MDL09320
00089CI  4330 8028 =0008C8I            BE    CONTLINE   YES, RESUME                   MDL09330
0008A0I  C530 000D                     CLHI  R3,X'0D'   CR??                          MDL09340
0008A4I  4330 F794 =00003CI            BE    NODIS      YES, PRINT RESTART            MDL09350
*0008A8I 220C                          B     LINWTND    NOT CR OR LF SO IGNORE        MDL09360
*0008AAI 230F                          B     CONTLINE   CONTINUE LIST
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0008ACI  C800 0019                 928 LINWTD   LHI   R0,25                                                   MDL09370
0008B0I  E670 801E =0008D2I        929          LDAI  R7,MSGWT                                                MDL09380
0008B4I  4130 80A6 =00095EI        930          BAL   R3,PRINT                                                MDL09390
0008B8I  C200 8004 =0008C0I        931          LPSW  LINEWT                                                  MDL09400
0008C0I                            932          ALIGN 8                                                       MDL09410
         0000 08C0I                933 LINEWT   EQU   *                                                       MDL09420
0008C0I                            934          IFNZ  ADC-2                                                   MDL09430
0008C0I  0000                      935          DC    X'0000',X'B0F0'                                         MDL09440
0008C2I  B0F0
0008C4I  0000                      936          DC    X'0000',Z(CONTLINE)                                     MDL09450
0008C6I  08C8I
                                   937          ELSE                                                          MDL09460
                                   938          DC    X'B000',Z(CONTLINE)                                     MDL09470
                                   939          ENDC                                                          MDL09480
0008C8I  0733                      940 CONTLINE XAR   R3,R3                                                   MDL09490
0008CAI  4030 848A =000D58I        941          STH   R3,LINCNT                                               MDL09500
0008CEI  4300 FF6E =00084 0I       942          B     LINEND                                                  MDL09510
0008D2I  5052 4553 5320 2252       943 MSGWT    DC    C'PRESS "RUN" TO CONTINUE',X'0D0A'                      MDL09520
0008DAI  554E 2220 544F 2043
0008E2I  4F4E 5449 4E55 4520
0008EAI  0D0A
0008ECI  4445 5052 4553 5320       944 MSGCON   DC    C'DEPRESS LF TO CONTINUE OR CR TO TERMINATE',X'0D0A'    MDL09530
0008F4I  4C46 2054 4F20 434F
0008FCI  4E54 494E 5545 204F
000904I  5220 4352 2054 4F20
00090CI  5445 524D 494E 4154
000914I  4520
000916I  0D0A
         0000 0918I                945 SEQASC   EQU   *                                                       MDL09540
000918I  242F                      946          LIS   R2,X'F'              SET UP MASK                        MDL09550
00091AI  2450                      947          LIS   R5,0                                                    MDL09560
00091CI  D341 0000                 948          LB    R4,0(R1)             GET THE HO BYTE                    MDL09570
000920I  0442                      949          NAR   R4,R2                MASK OFF THE HO DIGIT              MDL09580
000922I  D324 83B8 =000CDEI        950          LB    R2,ASCI(R4)          GET THE ASCII EQUIV. DIGIT         MDL09590
000926I  D220 8434 =000D5EI        951          STB   R2,ASCSEQ                                               MDL09600
00092AI  2651                      952          AIS   R5,1                                                    MDL09610
00092CI  2611                      953 SEQXX    AIS   R1,1                                                    MDL09620
00092EI  C550 0005                 954          CLHI  R5,5                                                    MDL09630
000932I  0333                      955          BER   R3                                                      MDL09640
000934I  C820 00F0                 956          LHI   R2,X'F0'                                                MDL09650
000938I  D341 0000                 957 SEQX1    LB    R4,0(R1)             GET THE MO BYTE                    MDL09660
00093CI  0442                      958          NAR   R4,R2                                                   MDL09670
00093EI  C350 0001                 959          THI   R5,1                                                    MDL09680
000942I  2332                      960          BZS   SEQ1XY                                                  MDL09690
000944I  1044                      961          SRLS  R4,4                                                    MDL09700
000946I  D374 8394 =000CDEI        962 SEQ1XY   LB    R7,ASCI(R4)          GET THE ASCII EQUIV.               MDL09710
00094AI  D275 8410 =000D5EI        963          STB   R7,ASCSEQ(R5)                                           MDL09720
00094EI  2651                      964          AIS   R5,1                                                    MDL09730
000950I  1024                      965          SRLS  R2,4                                                    MDL09740
000952I  C350 0001                 966          THI   R5,1                                                    MDL09750
000956I  4230 FFD2 =00092CI        967          BNZ   SEQXX                                                   MDL09760
00095AI  4300 FFDA =000938I        968          B     SEQX1                                                   MDL09770
         0000 095EI                969 PRINT    EQU   *                                                       MDL09780
00095EI  5030 80EE =000A50I        970          STA   R3,PRTRTN            SAVE                               MDL09790
000962I  D320 F6A0 =000006I        971          LB    R2,LPAD              LOAD ADDRESS                       MDL09800
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000966I  9D23                        SSR   R2,R3        SENSE STATUS                      MDL09810
000968I  4370 8030 =00099CI          BFC   7,TTYLP      USE LINE PRINTER                  MDL09820
00096CI  4830 F694 =000004I          LH    R3,DISFLG    GET FLAG                          MDL09830
000970I  4330 807C =0009F0I          BZ    CONOUT       USE SYSTEM CONSOLE                MDL09840
000974I  D320 F68F =000007I          LB    R2,TTYAD     LOAD ADDRESS                      MDL09850
000978I  9D23                        SSR   R2,R3        SENSE STATUS                      MDL09860
00097AI  4350 801E =00099CI          BFC   5,TTYLP      USE TTY                           MDL09870
00097EI  C820 0011                   LHI   R2,PASWAD    LOAD WRITE ADDRESS                MDL09880
000982I  9D23                        SSR   R2,R3        SENSE STATUS                      MDL09890
000984I  4250 8062 =0009EAI          BTC   5,PEXIT      NO DEVICES READY, IGNORE          MDL09900
000988I  D330 F67C =000008I          LB    R3,PASC2     LOAD COMMAND                      MDL09910
00098CI  9E23                        OCR   R2,R3        ISSUE COMMAND                     MDL09920
00098EI  C830 00A3          PRINB    LHI   R3,PASWR     LOAD COMMAND                      MDL09930
000992I  9E23               PRINA    OCR   R2,R3        ISSUE COMMAND                     MDL09940
000994I  9B23                        RDR   R2,R3        DUMMY READ                        MDL09950
000996I  9D23                        SSR   R2,R3                                          MDL09960
000998I  2081                        BTBS  8,1                                            MDL09970
*00099AI 2304                        B     PRIN1                                          MDL09980
00099CI  C830 0098          TTYLP    LHI   R3,TTYWR     LOAD COMMAND                      MDL09990
0009A0I  9E23               TTYLPA   OCR   R2,R3        ISSUE COMMAND                     MDL10000
0009A2I  9D24               PRIN1    SSR   R2,R4                                          MDL10010
0009A4I  2091                        BTBS  9,PRIN1      DU OR BUSY = WAIT                 MDL10020
0009A6I  DA27 0000                   WD    R2,0(R7)                                       MDL10030
0009AAI  C520 0011                   CLHI  R2,PASWAD    PASLA??                           MDL10040
0009AEI  4230 8020 =0009D2I          BNE   PRIN3        NO, SKIP DC2/DC4 CHECK            MDL10050
0009B2I  2721                        SIS   R2,1                                           MDL10060
0009B4I  9D23                        SSR   R2,R3                                          MDL10070
*0009B6I 2383                        BFC   6,PRIN6                                        MDL10080
0009B8I  2621               PRIN4    AIS   R2,1                                           MDL10090
*0009BAI 230C                        B     PRIN3                                          MDL10100
0009BCI  9B23               PRIN6    RDR   R2,R3                                          MDL10110
0009BEI  C530 0014                   CLHI  R3,X'14'                                       MDL10120
*0009C2I 2085                        BTC   11,PRIN4                                       MDL10130
0009C4I  9D23               PRIN5    SSR   R2,R3                                          MDL10140
0009C6I  2081                        BTBS  8,1                                            MDL10150
0009C8I  9B23                        RDR   R2,R3                                          MDL10160
0009CAI  C530 0012                   CLHI  R3,X'12'                                       MDL10170
*0009CEI 20B5                        BTC   11,PRIN5                                       MDL10180
*0009D0I 220C                        B     PRIN4                                          MDL10190
0009D2I  2671               PRIN3    AIS   R7,1         BUMP POINTER                      MDL10200
0009D4I  2701                        SIS   R0,1         DECREMENT CHARACTER COUNT         MDL10210
0009D6I  4230 FFC8 =0009A2I          BNZ   PRIN1        MORE CHARACTERS ? - YES           MDL10220
0009DAI  2430                        LIS   R3,0         NO                                MDL10230
0009DCI  9D24               PRIN2    SSR   R2,R4        OUTPUT NULL                       MDL10240
0009DEI  2081                        BTBS  8,PRIN2                                        MDL10250
0009E0I  9A23                        WDR   R2,R3        FOR ALL DEVICES                   MDL10260
0009E2I  9D24                        SSR   R2,R4                                          MDL10270
0009E4I  2081                        BTBS  8,1                                            MDL10280
0009E6I                              IFNZ  ADC-2                                          MDL10290
0009E6I  C820 0010                   LHI   R2,PASRAD    RELOAD PASLA READ ADDRESS         MDL10300
                                     ELSE                                                 MDL10310
                                     LHI   R2,STCADR    RELOAD STC ADDRESS                MDL10320
                                     ENDC                                                 MDL10330
0009EAI  5830 8062 =000A50I PEXIT    LDA   R3,PRTRTN                                      MDL10340
0009EEI  0303                        BR    R3           RETURN                            MDL10350
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         0000 09F0I              1027 CONOUT   EQU   *                                                   MDL10360
0009EEI                          1028          IFZ   ADC-2                                               MDL10370
                                 1029          LHI   R2,STCADR              LOAD ADDRESS                 MDL10380
                                 1030          LHI   R3,MBWR                LOAD COMMAND                 MDL10390
                                 1031          B     PRINA                  PRINT                        MDL10400
                                 1032          ELSE                                                      MDL10410
0009F0I  C820 0011               1033          LHI   R2,PASWAD              LOAD PASLA WRITE ADDRESS     MDL10420
0009F4I  4300 FF96 =00098EI      1034          B     PRINB                  PRINT                        MDL10430
                                 1035          ENDC                                                      MDL10440
0009F8I  2053 4551 2023 2020     1036 HEADER   DC    C' SEQ #   06- #   REV.              NAME   '       MDL10450
000A00I  2030 3620 2023 2020
000A08I  2052 4556 2E20 2020
000A10I  2020 2020 2020 2020
000A18I  2020 2020 2020 4E41
000A20I  4D45 2020
000A24I  2020 2020 2020 2020     1037          DC    C'                 LOW      HIGH'                     MDL10460
000A2CI  2020 2020 2020 204C
000A34I  4F57 2020 2020 2048
000A3CI  4947 4820
000A40I  0D0A                    1038 CRLF     DC    X'D0A'                                              MDL10470
000A42I  0D01                    1039 LINECR   DC    X'D01'                                              MDL10480
000A44I  2020 2020 2020 2020     1040 SPACE    DC    C'          '                                       MDL10490
000A4CI                          1041          ALIGN 4                                                   MDL10500
000A4CI                          1042 FMTRTN   DS    4                                                   MDL10510
000A50I                          1043 PRTRTN   DS    4                                                   MDL10520
000A54I                          1044 DIRPRM   DS    8                                                   MDL10530
                                 1045 *  S T B K A D                                                     MDL10540
                                 1046 *                                                                  MDL10550
                                 1047 *     THIS ROUTINE WILL RETURN THE PROPER VALUES TO SET UP THE     MDL10560
                                 1048 *     SELCH OR TO SET UP THE WRITE BLOCK.                          MDL10570
                                 1049 *                                                                  MDL10580
                                 1050 *        INPUT = RD = LOW ADDRESS TO BE COPIED                     MDL10590
                                 1051 *                RE = HIGH ADDRESS TO BE COPIED                    MDL10600
                                 1052 *                R3 = RETURN ADDRESS                               MDL10610
                                 1053 *        OUTPUT = R4 = 0 MORE DATA BLOCKS REQUIRED TO FINISH       MDL10620
                                 1054 *                        THE ENTIRE TRANSFER                       MDL10630
                                 1055 *                  = F INDICATES THAT THIS IS THE LAST             MDL10640
                                 1056 *                    BLOCK OF THE TRANSFER                         MDL10650
                                 1057 *                R5 = LOW ADDRESS FOR THIS BLOCK                   MDL10660
                                 1058 *                R6 = HIGH ADDRESS FOR THIS BLOCK                  MDL10670
                                 1059 *                RD = ENTRY VALUE + X'100'                         MDL10680
                                 1060 *                RE = ENTRY VALUE (NEVER ALTERED)                  MDL10690
                                 1061 *                                                                  MDL10700
000A5CI  085D                    1062 STBKAD   LDAR  R5,RD                  COPY THE LOW POINTER         MDL10710
000A5EI  086E                    1063          LDAR  R6,RE                  COPY THE HIGH POINTER        MDL10720
000A60I  0B65                    1064          SAR   R6,R5                  SUBTRACT (HIGH - LOW)        MDL10730
000A62I  C560 00FF               1065          CLHI  R6,X'FF'                                            MDL10740
000A66I  218A                    1066          BLS   NOMORE                                              MDL10750
000A68I  2339                    1067          BES   NOMORE                                              MDL10760
000A6AI  085D                    1068          LDAR  R5,RD                                               MDL10770
*000A6CI CAD0 0100               1069          AAI   RD,X'100'                                           MDL10780
000A70I  0865                    1070          LDAR  R6,R5                                               MDL10790
*000A72I CA60 00FF               1071          AAI   R6,X'FF'                                            MDL10800
000A76I  2440                    1072          LIS   R4,0                                                MDL10810
000A78I  0303                    1073          BR    R3                                                  MDL10820
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000A7AI  244F                   1074 NOMORE   LIS   R4,15                                             MDL10830
000A7CI  C560 0000              1075          CLHI  R6,X'00'          DIFFERENCE = 0 ?               MDL10840
000A80I  2334                   1076          BES   NOMO1                                            MDL10850
000A82I  085D                   1077          LDAR  R5,RD                                            MDL10860
000A84I  086E                   1078          LDAR  R6,RE                                            MDL10870
000A86I  0303                   1079          BR    R3                                               MDL10880
000A88I  085D                   1080 NOMO1    LDAR  R5,RD                                            MDL10890
000A8AI  0865                   1081          LDAR  R6,R5                                            MDL10900
000A8CI  2661                   1082          AIS   R6,1              ADD 1 SO THAT A MIN. OF 2 BYTES MDL10910
000A8EI  0303                   1083          BR    R3                                               MDL10920
                                1084 *  N O M O T N                                                  MDL10930
                                1085 *                                                               MDL10940
                                1086 *    WAIT FOR NO MOTION                                         MDL10950
                                1087 *                                                               MDL10960
                                1088 *          R0 = RETURN ADDRESS                                  MDL10970
                                1089 *          R1 = SCRATCH REGISTER                                MDL10980
                                1090 *          RA = THE DEVICE ADDRESS                              MDL10990
                                1091 *                                                               MDL11000
000A90I  9DA1                   1092 NOMOTN   SSR   RA,R1             SENSE THE STATUS               MDL11010
*000A92I 2115                   1093          BTC   1,MTERXY                                         MDL11020
000A94I  C310 0010              1094          THI   R1,X'10'          NOMOTION SET ?                 MDL11030
000A98I  2234                   1095          BZS   NOMOTN            NO - WAIT                      MDL11040
000A9AI  0300                   1096          BR    R0                YES - RETURN                   MDL11050
000A9CI  C810 00E7              1097 MTERXY   LHI   R1,X'E7'                                         MDL11060
000AA0I  4300 81CC =000C70I     1098          B     ERRA                                             MDL11070
                                1099 *  W D F T                                                      MDL11080
                                1100 *                                                               MDL11090
                                1101 *    WRITE THE DATA TO THE FILE                                 MDL11100
                                1102 *                                                               MDL11110
                                1103 *          RA =  FILE ADDRESS                                   MDL11120
                                1104 *          R3 =  RETURN ADDRESS                                 MDL11130
                                1105 *          RF =  USED AS SCRATCH                                MDL11140
                                1106 *          R1 =  USED AS SCRATCH                                MDL11150
000AA4I  4810 82A6 =000D4EI     1107 WDFT     LH    R1,TRKDFN                                        MDL11160
000AA8I  2712                   1108          SIS   R1,2              TEST IF 10 MB         R05
*000AAAI 233E                   1109          BZ    WDFT2             *                     R05      MDL11180
000AACI  4810 8292 =000D42I     1110 WDFTA    LH    R1,HEAD           *                     R05
000AB0I  C8F0 0020              1111          LHI   RF,X'20'          *                     R05      MDL11200
000AB4I  98A1                   1112          WHR   RA,R1                                            MDL11210
000AB6I  9EAF                   1113          OCR   RA,RF                                            MDL11220
000AB8I  4810 8284 =000D40I     1114          LH    R1,CYL            *                     R05
000ABCI  C8F0 0010              1115          LHI   RF,X'10'          *                     R05      MDL11240
000AC0I  98A1                   1116          WHR   RA,R1                                            MDL11250
000AC2I  9EAF                   1117          OCR   RA,RF                                            MDL11260
000AC4I  0303                   1118          BR    R3                                               MDL11270
000AC6I  DAA0 8276 =000D40I     1119 WDFT2    WD    RA,CYL            SEND MS CYLINDER      R05      MDL11280
000ACAI  DAA0 8273 =000D41I     1120          WD    RA,CYL+1          SEND LS CYLINDER      R05
000ACEI  0303                   1121          BR    R3                                               MDL11390
                                1122 *  F R S R W                                                    MDL11400
                                1123 *    FILE READY TO SEEK READ OR WRITE ?                         MDL11410
                                1124 *                                                               MDL11420
                                1125 *          R3  =  RETURN ADDRESS                                MDL11430
000AD0I  9DC1                   1126 FRSRW    SSR   RC,R1             WAIT FOR CONTROLLER IDLE       MDL11440
000AD2I  2221                   1127          BFBS  2,1                                              MDL11450
000AD4I  9DA1                   1128          SSR   RA,R1             GET FILE STAT                  MDL11460
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*000AD6I  2119                          BTC    1,ERRXZY          DU ?                 MDL11470
 000AD8I  C310 0008                     THI    R1,X'08'                               MDL11480
 000ADCI  2036                          BNZS   FRSRW                                  MDL11490
 000ADEI  2172                          BTFS   7,FRSERR                               MDL11500
 000AE0I  0303                          BR     R3                                     MDL11510
 000AE2I  C310 0010           FRSERR    THI    R1,X'10'                               MDL11520
 000AE6I  203B                          BNZS   FRSRW                                  MDL11530
          0000 0AE8I          ERRXZY    EQU    *                                      MDL11540
 000AE8I  C810 00E8                     LHI    R1,X'E8'                               MDL11550
 000AECI  4300 8180 =000C70I            B      ERRA                                   MDL11560
                              *  R C H K                                              MDL11570
                              *    READ CHECK SUBROUTINE                              MDL11580
                              *                                                       MDL11590
                              *          R3 = RETURN ADDRESS                          MDL11600
                              *          R8 = SECTOR NUMBER                           MDL11610
                              *                                                       MDL11620
 000AF0I  5030 8240 =000D34I  RCHK      STA    R3,ADDRES                              MDL11630
 000AF4I  4870 8256 =000D4EI            LH     R7,TRKDEN                              MDL11640
 000AF8I  C570 0002                     CLHI   R7,2              *               R05
*000AFCI  233C                          BE     RCHK1             BRANCH IF 1n MB R05
 000AFEI  4130 FFA2 =000AA4I            BAL    R3,WDFT                                MDL11670
 000B02I  9AC8                          WDR    RC,R8                                  MDL11680
 000B04I  4830 823A =000D42I            LH     R3,HEAD                                MDL11690
 000B08I  113A                          SLLS   R3,10                                  MDL11700
 000B0AI  4870 8232 =000D40I            LH     R7,CYL                                 MDL11710
 000B0EI  0637                          OAR    R3,R7             MERGE CYL            MDL11720
 000B10I  98C3                          WHR    RC,R3                                  MDL11730
*000B12I  230A                          B      RCHK3                                  MDL11740
 000B14I  4130 FFB8 =000AD0I  RCHK1     BAL    R3,FRSRW                               MDL11750
 000B18I  4130 FF88 =000AA4I            BAL    R3,WDFT                                MDL11760
 000B1CI  4830 8222 =000D42I            LH     R3,HEAD                                MDL11770
 000B20I  1135                          SLLS   R3,5                                   MDL11780
 000B22I  0638                          OAR    R3,R8                                  MDL11790
 000B24I  9AC3                          WDR    RC,R3                                  MDL11800
 000B26I  DEC0 81DE =000D08I  RCHK3     OC     RC,RCHECK                              MDL11810
 000B2AI  4130 8006 =000B34I            BAL    R3,SETCON                              MDL11820
 000B2EI  5830 8202 =000D34I  RCHK2     LDA    R3,ADDRES         GET ADDRESS          MDL11830
 000B32I  0303                          BR     R3                RETURN               MDL11840
                              *  S E T C O N                                          MDL11850
          0000 0B34I          SETCON    EQU    *                                      MDL11860
 000B34I  9DC1                          SSR    RC,R1                                  MDL11870
 000B36I  2221                          BFBS   2,SETCON                               MDL11880
 000B38I  4010 8218 =000D54I            STH    R1,CONSTA                              MDL11890
 000B3CI  DEC0 81CC =000D0CI            OC     RC,RESET                               MDL11900
 000B40I  0303                          BR     R3                                     MDL11910
          0000 0B42I          LCORE     EQU    *                 INITIALIZE           MDL11920
 000B42I                                IFNZ   ADC-2                                  MDL11930
                              *    INITIALIZE FOR THF 32 SERIES PROCESSOR             MDL11940
 000B42I  C200 807A =000BC0I            LPSW   INIT32                                 MDL11950
*000B46I  C800 00F0           GO32      LI     R0,Y'000000F0'                         MDL11960
 000B4AI  5000 0020                     ST     R0,X'20'                               MDL11970
 000B4EI  5000 0024                     ST     R0,X'24'                               MDL11980
 000B52I  5000 0028                     ST     R0,X'28'                               MDL11990
 000B56I  5000 002C                     ST     R0,X'2C'                               MDL12000
 000B5AI  5000 0030                     ST     R0,X'30'                               MDL12010
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000B5EI  E610 80A4 =000C06I   1184          LA    R1,ILLIST                                          MDL12020
000B62I  5010 0034            1185          ST    R1,X'34'                                           MDL12030
000B66I  5000 0038            1186          ST    R0,X'38'                                           MDL12040
000B6AI  E610 80A0 =000C0EI   1187          LA    R1,MCHMAL                                          MDL12050
000B6EI  5010 003C            1188          ST    R1,X'3C'                                           MDL12060
000B72I  5000 0040            1189          ST    R0,X'40'                                           MDL12070
000B76I  5000 0044            1190          ST    R0,X'44'                                           MDL12080
000B7AI  5000 0048            1191          ST    R0,X'48'                                           MDL12090
000B7EI  E610 807C =000BFEI   1192          LA    R1,ARFLT                                           MDL12100
000B82I  5010 004C            1193          ST    R1,X'4C'                                           MDL12110
000B86I  5000 0080            1194          ST    R0,X'80'                                           MDL12120
000B8AI  E610 820A =000D98I   1195          LA    R1,OLDPSW          *                               MDL12130
000B8EI  CA10 00FF            1196          AHI   R1,X'FF'           ROUND UP TO 256KB BOUNDARY  R15
000B92I  C410 FF00            1197          NHI   R1,X'FF00'         *                           R15
000B96I  4010 0084            1198          STH   R1,X'84'                                           MDL12140
000B9AI  2618                 1199          AIS   R1,8               *                           R05
000B9CI  4010 0086            1200          STH   R1,X'86'                                           MDL12160
000BA0I  4000 0088            1201          STH   R0,X'88'                                           MDL12170
000BA4I  E610 8096 =000C3EI   1202          LA    R1,IOVQU                                           MDL12180
000BA8I  5010 008C            1203          ST    R1,X'8C'                                           MDL12190
000BACI  5000 0090            1204          ST    R0,X'90'                                           MDL12200
000BB0I  E610 8090 =000C44I   1205          LA    R1,MACINT                                          MDL12210
000BB4I  5010 0094            1206          ST    R1,X'94'                                           MDL12220
000BB8I  5000 0098            1207          ST    R0,X'98'                                           MDL12230
*000BBCI 2306                 1208          B     INTCOM                                             MDL12240
 000BC0I                      1209          ALIGN 8                                                  MDL12250
 000BC0I 0000                 1210  INIT32  DC    X'0000',X'30F0'                                    MDL12260
 000BC2I 30F0
 000BC4I 0000                 1211          DC    X'0000',Z(G032)                                    MDL12270
 000BC6I 0B46I
                              1212          ELSE                                                     MDL12280
                              1213          LPSW  INIT16                                             MDL12290
                              1214  G016    XHR   R0,R0                                              MDL12300
                              1215          STH   R0,X'2C'                                           MDL12310
                              1216          STH   R0,X'34'                                           MDL12320
                              1217          STH   R0,X'3C'                                           MDL12330
                              1218          STH   R0,X'44'                                           MDL12340
                              1219          STH   R0,X'4C'                                           MDL12350
                              1220          LHI   R0,REGSAV          *                           R05 MDL12360
                              1221          STH   R0,X'22'                                           MDL12370
                              1222          LHI   R0,ARFLT                                           MDL12380
                              1223          STH   R0,X'2E'                                           MDL12390
                              1224          LHI   R0,ILLIST                                          MDL12400
                              1225          STH   R0,X'36'                                           MDL12410
                              1226          LHI   R0,MCHMAL                                          MDL12420
                              1227          STH   R0,X'3E'                                           MDL12430
                              1228          LHI   R0,INTER                                           MDL12440
                              1229          STH   R0,X'46'                                           MDL12450
                              1230          LHI   R0,DIVFLT                                          MDL12460
                              1231          STH   R0,X'4E'                                           MDL12470
                              1232          B     BEGIN                                              MDL12480
                              1233  INIT16  DC    X'3000',Z(G016)                                    MDL12490
                              1234          ENDC                                                     MDL12500
 000BC8I  4830 807E =000C4AI  1235  INTCOM  LH    R3,SVCERR                                          MDL12510
 000BCCI  C810 009C           1236          LHI   R1,X'9C'                                           MDL12520
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000BD0I  4031 0000            1237  X9C     STH   R3,0(R1)                                  MDL12530
000BD4I  2612                 1238          AIS   R1,2                                       MDL12540
000BD6I  C510 00BC            1239          CLHI  R1,X'BC'                                  MDL12550
000BDAI  2035                 1240          BNES  X9C                                       MDL12560
000BDCI  0700                 1241          XAR   R0,R0                                     MDL12570
000BDEI  4001 0000            1242  XBC     STH   R0,0(R1)                                  MDL12580
000BE2I  2612                 1243          AIS   R1,2                                       MDL12590
000BE4I  C510 0000            1244          CLHI  R1,X'D0'                                  MDL12600
000BE8I  2035                 1245          BNES  XBC                                       MDL12610
000BEAI  C800 0C50I           1246          LHI   R0,INTER          SET THE ADDRESS         MDL12620
000BEEI  4001 0000            1247  XCC     STH   R0,0(R1)                                  MDL12630
000BF2I  2612                 1248          AIS   R1,2                                       MDL12640
000BF4I  C510 02D0            1249          CLHI  R1,X'2D0'                                 MDL12650
000BF8I  2035                 1250          BNES  XCC                                       MDL12660
000BFAI  4300 F40E =00000CI   1251          B     BEGIN                                     MDL12670
000BFEI  C800 00F0            1252  ARFLT   LHI   R0,X'F0'          FLPT ARIT FAULT         MDL12680
000C02I  4300 804C =000C52I   1253          B     PSWE                                      MDL12690
000C06I  C800 00F1            1254  ILLIST  LHI   R0,X'F1'          ILLEGAL INST.           MDL12700
000C0AI  4300 8044 =000C52I   1255          B     PSWE                                      MDL12710
*000C0EI 211D                 1256  MCHMAL  BTC   1,PFAIL                                   MDL12720
 000C10I C200 8004 =000C18I   1257          LPSW  MCHPSW                                    MDL12730
 000C18I                      1258          ALIGN 8                                         MDL12740
         0000 0C18I           1259  MCHPSW  EQU   *                                         MDL12750
 000C18I                      1260          IFNZ  ADC-2                                     MDL12760
 000C18I 0000                 1261          DC    X'0000',X'30F0'                           MDL12770
 000C1AI 30F0
 000C1CI 0000                 1262          DC    X'0000',Z(MCH1)                           MDL12780
 000C1EI 0C20I
                              1263          ELSE                                            MDL12790
                              1264          DC    X'3000',Z(MCH1)                           MDL12800
                              1265          ENDC                                            MDL12810
 000C20I C800 00F2            1266  MCH1    LHI   R0,X'F2'                                  MDL12820
 000C24I 4300 802A =000C52I   1267          B     PSWE                                      MDL12830
 000C28I C200 8004 =000C30I   1268  PFAIL   LPSW  PFL                                       MDL12840
 000C30I                      1269          ALIGN 8                                         MDL12850
         0000 0C30I           1270  PFL     EQU   *                                         MDL12860
 000C30I                      1271          IFNZ  ADC-2                                     MDL12870
 000C30I 0000                 1272          DC    X'0000',X'B0F0'                           MDL12880
 000C32I B0F0
 000C34I 0000                 1273          DC    X'0000',Z(PFAIL)                          MDL12890
 000C36I 0C28I
                              1274          ELSE                                            MDL12900
                              1275          DC    X'B000',Z(PFAIL)                          MDL12910
                              1276          ENDC                                            MDL12920
 000C38I C800 00F3            1277  DIVFLT  LHI   R0,X'F3'          DIVIDE FAULT            MDL12930
*000C3CI 2308                 1278          B     PSWE                                      MDL12940
 000C3EI C800 00F5            1279  IOVQU   LHI   R0,X'F5'          I/O QUEUE OVERFLOW      MDL12950
*000C42I 2308                 1280          B     PSWE                                      MDL12960
 000C44I C800 00F6            1281  MACINT  LHI   R0,X'F6'          MAC INTERRUPT           MDL12970
 000C48I 2305                 1282          BS    PSWE                                      MDL12980
 000C4AI C800 00F7            1283  SVCERR  LHI   R0,X'F7'          SVC INTERRUPT           MDL12990
 000C4EI 2302                 1284          BS    PSWE                                      MDL13000
         0000 0C50I           1285  INTER   EQU   *                                         MDL13010
 000C50I                      1286          IFNZ  ADC-2                                     MDL13020
 000C50I 1800                 1287          LPSWR R0                RETURN TO WHERE INTERRUPTED MDL13030
```

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                                1288           ELSE                                                 MDL13040
                                1289           ACK   RF,SCRAP                                       MDL13050
                                1290           LPSW  X'40'          RETURN TO WHERE INTERRUPTED     MDL13060
                                1291           ENDC                                                 MDL13070
           0000 0C52I           1292  PSWE     EQU   *                                              MDL13080
 000C52I   0810                 1293           LDAR  R1,R0                                          MDL13090
           0000 0C54I           1294  ERROR    EQU   *                                              MDL13100
 000C54I   0722                 1295           XAR   R2,R2                                          MDL13110
           0000 0C56I           1296  ERR1X    EQU   *                                              MDL13120
 000C56I   07BB                 1297           XAR   RB,RB                                          MDL13130
 000C58I   24A1                 1298           LIS   RA,1                                           MDL13140
 000C5AI   DEA0 80B0 =000D0EI   1299           OC    RA,ABORT1                                      MDL13150
 000C5EI   9AA1                 1300           WDR   RA,R1                                          MDL13160
 000C60I   9AA2                 1301           WDR   RA,R2                                          MDL13170
 000C62I   9AAB                 1302           WDR   RA,RB                                          MDL13180
 000C64I   9AAB                 1303           WDR   RA,RB                                          MDL13190
 000C66I   DEA0 80A5 =000D0FI   1304           OC    RA,ABORT1+1                                    MDL13200
 000C6AI   2145                 1305           BTFS  4,NODIS2       FALSE SYNC                      MDL13210
 000C6CI   C200 F440 =0000B0I   1306           LPSW  GETNUM                                         MDL13220
 000C70I   082A                 1307  ERRA     LDAR  R2,RA                                          MDL13230
*000C72I   220E                 1308           B     ERR1X                                          MDL13240
           0000 0C74I           1309  NODIS2   EQU   *                                              MDL13250
*000C74I   C510 00FF            1310           CLAI  R1,X'FF'       EOJ TERMINATION??               MDL13260
 000C78I   4330 8048 =000CC4I   1311           BE    EOJPR          YES                             MDL13270
 000C7CI   0832                 1312           LDAR  R3,R2          PUT ERROR CODE IN R3            MDL13280
 000C7EI   C430 00F0            1313           NHI   R3,X'F0'       MASK                            MDL13290
 000C82I   1034                 1314           SRLS  R3,4           SCALE                           MDL13300
 000C84I   D333 8056 =000CDEI   1315           LB    R3,ASCI(R3)    MAKE ASCII                      MDL13310
 000C88I   D230 8068 =000CF4I   1316           STB   R3,ERRMES+6    STORE TO MESSAGE                MDL13320
 000C8CI   0832                 1317           LDAR  R3,R2          RELOAD                          MDL13330
 000C8EI   C430 000F            1318           NHI   R3,X'F'        MASK                            MDL13340
 000C92I   D333 8048 =000CDEI   1319           LB    R3,ASCI(R3)    MAKE ASCII                      MDL13350
 000C96I   D230 805B =000CF5I   1320           STB   R3,ERRMES+7    STORE TO MESSAGE                MDL13360
 000C9AI   0831                 1321           LDAR  R3,R1          PUT ERROR CODE IN R3            MDL13370
 000C9CI   C430 00F0            1322           NHI   R3,X'F0'       MASK                            MDL13380
 000CA0I   1034                 1323           SRLS  R3,4           SCALE                           MDL13390
 000CA2I   D333 8038 =000CDEI   1324           LB    R3,ASCI(R3)    MAKE ASCII                      MDL13400
 000CA6I   D230 804C =000CF6I   1325           STB   R3,ERRMES+8    STORE TO MESSAGE                MDL13410
 000CAAI   0831                 1326           LDAR  R3,R1          RELOAD                          MDL13420
 000CACI   C430 000F            1327           NHI   R3,X'F'        MASK                            MDL13430
 000CB0I   D333 802A =000CDEI   1328           LB    R3,ASCI(R3)    MAKE ASCII                      MDL13440
 000CB4I   D230 803F =000CF7I   1329           STB   R3,ERRMES+9    STORE TO MESSAGE                MDL13450
 000CB8I   E640 8032 =000CEEI   1330           LDAI  R4,ERRMES      LOAD START ADDRESS              MDL13460
 000CBCI   E680 803B =000CF3I   1331           LDAI  R8,ERRMESE+1   LOAD END ADDRESS                MDL13470
 000CC0I   4300 F386 =00004AI   1332           B     OUT04          PRINT TO CONSOLE                MDL13480
 000CC4I   E640 8008 =000CD0I   1333  EOJPR    LDAI  R4,EOJMES      LOAD START                      MDL13490
 000CC8I   E680 8011 =000CDDI   1334           LDAI  R8,EOJMESE+1   LOAD END                        MDL13500
 000CCCI   4300 F37A =00004AI   1335           B     OUT04          PRINT                           MDL13510
 000CD0I   454E 4420 4F46 204A  1336  EOJMES   DC    C'END OF JOB',X'0D0A'                          MDL13520
 000CD8I   4F42
 000CDAI   0D0A
 000CDCI   2A20                 1337  EOJMESE  DC    C'*'                                           MDL13530
 000CDEI   3031 3233 3435 3637  1338  ASCI     DC    C'0123456789ABCDEF'                            MDL13540
 000CE6I   3839 4142 4344 4546
 000CEEI   4552 524F 5220 4040  1339  ERRMES   DC    C'ERROR @@@@',X'0D0A'                          MDL13550
```

```
000CF6I  4040
000CF8I  0D0A
000CFAI  2A20
000CFCI  C020
         0000 0CFDI
000CFEI  2221
         0000 0CFFI
000D00I  2300
000D02I  0201
         0000 0D03I
000D04I  0848
         0000 0D05I
000D06I  C211
         0000 0D07I
000D08I  03C1
         0000 0D09I
000D0AI  7030
         0000 0D0BI
000D0CI  C800
000D0EI  4080
000D10I  D8
000D11I  19
000D12I  A0
000D13I  90
000D14I
000D14I
000D18I
000D1CI
000D20I
000D24I
000D28I
000D2CI
000D30I
000D34I
000D38I
000D3CI
000D40I
000D42I
000D44I
000D46I
000D48I
000D4AI
000D4CI
000D4EI
000D50I
000D52I
000D54I
000D56I
000D58I
000D5AI
000D5CI
000D5EI
000D64I
000D64I
000D98I

1340  ERRMESE  DC    C'*'                                          MDL13560
1341  DISABL   DC    X'C020'      DISABLE / CLEAR                  MDL13570
1342  CLEAR    EQU   DISABL+1                                      MDL13580
1343  MTWRT    DC    X'2221'      MAG TAPE WRITE/READ              MDL13590
1344  MTREAD   EQU   MTWRT+1                                      MDL13600
1345  FWFM     DC    X'2300'      FORWARD FILEMARK                 MDL13610
1346  DWRIT    DC    X'0201'      DISC WRITE / READ                MDL13620
1347  DREAD    EQU   DWRIT+1                                       MDL13630
1348  STOP     DC    X'0848'      STOP / EXT. STOP                 MDL13640
1349  ESTOP    EQU   STOP+1                                        MDL13650
1350  SEEK     DC    X'C211'      SEEK / BACKSPACE                 MDL13660
1351  BKSP     EQU   SEEK+1                                        MDL13670
1352  RCHECK   DC    X'03C1'      READ CHECK / RESTORE             MDL13680
1353  RESTOR   EQU   RCHECK+1                                     MDL13690
1354  ESREAD   DC    X'7030'      EXT READ / READ                  MDL13700
1355  SREAD    EQU   ESREAD+1                                      MDL13710
1356  RESET    DC    X'C800'                                       MDL13720
1357  ABORT1   DC    X'4080'      INCRIMENTAL/NORMAL               MDL13730
1358  DISAB625 DB    X'D8'        DISARM COMMAND          R05
1359  CLEAR625 DB    X'19'        CLEAR CONTROLLER COMMAND R05
1360  FWFM625  DB    X'A0'        FORWARD FILE COMMAND     R05
1361  BKSP625  DB    X'90'        BACKSPACE RECORD         R05
1362           ALIGN 4                                            MDL13740
1363  LOW      DS    4                                           MDL13750
1364  HIGH     DS    4                                           MDL13760
1365  WRTEND   DS    4                                           MDL13770
1366  EOVRTN   DS    4                                           MDL13780
1367  STADD    DS    4                                           MDL13790
1368  FADD     DS    4                                           MDL13800
1369  MISTRN   DS    4                                           MDL13810
1370  PGMNUM   DS    4                                           MDL13820
1371  ADDRES   DS    4                                           MDL13830
1372  AVARTN   DS    4                                           MDL13840
1373  UPDTRN   DS    4                                           MDL13850
1374  CYL      DS    2                                           MDL13860
1375  HEAD     DS    2                                           MDL13870
1376  AVAFLG   DS    2                                           MDL13880
1377  INTADD   DS    2                                           MDL13890
1378  LSTBLK   DS    2                                           MDL13900
1379  NUMBLK   DS    2                                           MDL13910
1380  HEXNUM   DS    2                                           MDL13920
1381  TRKDEN   DS    2                                           MDL13930
1382  SELIND   DS    2                                           MDL13940
1383  RWDEV    DS    2                                           MDL13950
1384  CONSTA   DS    2                                           MDL13960
1385  SELERR   DS    2                                           MDL13970
1386  LINCNT   DS    2                                           MDL13980
1387  SCRAP    DS    2                                           MDL13990
1388  RETRY    DS    2                                           MDL14000
1389  ASCSEQ   DS    6                                           MDL14010
1390           ALIGN 4                                           MDL14070
1391  PDB      DS    52           *                R05          MDL14080
1392           ALIGN 4                                           MDL14090
```

```
    0000 0D98I        1393  DIRECT   EQU   *           THIS MUST BE THE LAST CARD                    MDL14100
    0000 0D98I        1394  OLDPSW   EQU   *           *                                   R05
    0000 0DA0I        1395  REGSAV   EQU   *+8         *                                   R05       MDL14110
    0000 0D98I        1396  END      EQU   *                                                         MDL14120
000D98I               1397           END
```

ASSEMBLED BY CAL 03-066R08-00 (32-BIT)

START OPTIONS: T=32,ERLST

NO CAL ERRORS
NO CAL WARNINGS
6 PASSES

TABLE SPACE USED : 9K

```
HSAV      0000 0102I    205*   216    218
ILLIST    0000 0C06I   1184   1254*
IMPTOP    0000 0D98I   1397
INIT32    0000 0BC0I   1177   1210*
INTADD    0000 0D46I   1377*
INTCOM    0000 0BC8I   1208   1235*
INTER     0000 0C50I   1246   1285*
IOVQU     0000 0C3EI   1202   1279*
LADC      0000 0002
LCORE     0000 0B42I     85   1174*
LINCNT    0000 0D58I    752    900    904    941   1386*
LINECR    0000 0A42I    893   1039*
LINEND    0000 0840I    755    762    888*   942
LINEWT    0000 08C0I    931    933*
LINWT     0000 0976I    902    906*
LINWTD    0000 08ACI    908    928*
LINWTND   0000 0890I    918*   926
LISMT1    0000 06A6I    770    772*   785
LIST      0000 0660I    254    750*
LODDIS    0000 024EI    256    306*
LOW       0000 0D14I    290    380    417    421    514   1363*
LPAD      0000 0006I     89*   889    971
LSTBLK    0000 0D48I   1378*
LSTDIS    0000 06D6I    765    786*
LSTDS0    0000 06E8I    792*   834
LSTDS1    0000 0716I    804*   826
LSTXYZ    0000 0766I    807    824*
MACINT    0000 0C44I   1205   1281*
MAGFF1    0000 01C2I    266    270*   284    288
MBRD      0000 0082     101*
MBWR      0000 0002     100*
MCH1      0000 0C20I   1262   1266*
MCHMAL    0000 0C0EI   1187   1256*
MCHPSW    0000 0C18I   1257   1259*
MESOK     0000 022CI    122    300*
MESOKEND  0000 024CI    123    301*
MISEND    0000 039EI    428*   432
MISERR    0000 03ACI    427    433*
MISHI     0000 0386I    416    420*
MISTR1    0000 035EI    406*
MISTR2    0000 0362I    407*   419
MISTRN    0000 0D2CI    406    428   1369*
MISTRT    0000 035CI    289    379    405*
MOREMT    0000 0210I    292*   296
MSGCON    0000 08ECI    910    944*
MSGWT     0000 0902I    929    943*
MT6250    0000 01BAI    263    267*
MT6251    0000 01D2I    272    275*
MT6252    0000 01D6I    274    276*
MT6253    0000 04C0I    575    578*
MT6254    0000 04C4I    577    579*
MT6255    0000 0562I    649    652*
MT6256    0000 0566I    651    653*
MT6259    0000 05AEI    675    678*
MT625A    0000 05B2I    677    679*
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MT625B    0000 06A2I      768    771*
MT625C    0000 06B6I      774    777*
MT625D    0000 06BAI      776    778*
MTDEV     0000 018EI      220    249*
MTEND     0000 05BAI      656    682*
MTENDX    0000 0224I      293    298*
MTFOV     0000 02EAI      248*   280
MTERR     0000 0570I      594    654    657*   660
MTERR1    0000 0594I      667    670*
MTERRW    0000 0586I      663    666*
MTERXY    0000 049CI     1093   1097*
MTREAD    0000 0CFFI     1344*
MTRY      0000 04C4I      580*   681
MTWRT     0000 0CFEI     1343*  1344
NODIS     0000 003CI      117    119*   168    925
NODIS2    0000 0C74I     1305   1309*
NOMO1     0000 0A88I     1076   1080*
NOMORE    0000 0A7AI     1066   1067   1074*
NOMOTN    0000 0A90I      277    672    680    779   1092*  1095
NORTRM    0000 0478I      525*   782    805    829
NOTHEX    0000 0126I      204    212    214    217*
NUMBLK    0000 0D4AI     1379*
OLDPSW    0000 0D98I     1195   1394*
OUT02     0000 0078I      151*   167
OUT03     0000 005AI      135*   141
OUT04     0000 004AI      124*   157   1332   1335
OUT05     0000 009EI      161    164*
PASC2     0000 0008I       91*   127    982
PASRAD    0000 0010        88*   144   1021
PASRD     0000 00A1        98*   145    915
PASWAD    0000 0011        87*   126    979    995   1033
PASWR     0000 00A3        99*   129    984
PDB       0000 0D64I      278    279    283    286    376    377    408    410    413    522    780    781    818
                          819    841    847    853    855    859    867    870    875    883   1391*

PEXIT     0000 09EAI      981   1025*
PFAIL     0000 0C28I     1256   1268*  1273
PFL       0000 0C30I     1268   1270*
PGMNUM    0000 0030I      104    105    164    191    200    282    285    326    329   1370*
PRGLOW    0000 03A4I      424    430*
PRIN1     0000 09A2I      989    992*   993   1013
PRIN2     0000 09DCI     1015*  1016
PRIN3     0000 09D2I      996   1001   1011*
PRIN4     0000 09B8I     1000*  1004   1010
PRIN5     0000 09C4I     1005*  1009
PRIN6     0000 09BCI      999   1002*
PRINA     0000 0992I      985*
PRINB     0000 098EI      984*  1034
PRINT     0000 095EI      759    839    842    845    848    851    854    860    865    868    871    874    879
                          882    887    894    899    911    930    969*

PRNTLN    0000 0858I      891    897*
PRNTTL    0000 068AI      760    763*
PRTRTN    0000 0A50I      970   1025   1043*
PSWE      0000 0C52I     1253   1255   1267   1278   1280   1282   1284   1292*
PURETOP   0000 0000P     1397
R0        0000 0000        14*   103    104    105    106    107    120    121    200    201    203    205    207
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			211	213	215	217	261	262	270	271	277	619	620	622	638
			639	641	642	672	673	674	680	712	713	714	731	732	757
			766	767	772	773	779	837	840	843	846	849	852	855	856
			858	861	863	866	869	872	877	880	885	892	897	909	928
			1042	1096	1178	1179	1180	1181	1182	1183	1186	1189	1190	1191	1194
			1201	1204	1207	1241	1241	1242	1246	1247	1252	1254	1266	1277	1279
			1281	1283	1287	1293									
R1	0000 0001		15*	108	109	112	113	114	115	116	126	128	134	136	138
			144	149	150	151	153	154	177	178	179	180	280	293	298
			321	329	330	352	405	408	410	413	415	415	418	433	525
			527	568	569	570	612	613	643	644	650	652	658	659	661
			662	668	686	700	701	702	703	705	706	734	735	737	741
			782	875	883	948	953	957	1092	1094	1097	1107	1108	1110	1112
			1114	1116	1126	1128	1130	1134	1137	1169	1171	1184	1185	1187	1188
			1192	1193	1195	1196	1197	1198	1199	1200	1202	1203	1205	1206	1236
			1237	1238	1239	1242	1243	1244	1247	1248	1249	1293	1300	1310	1321
			1326												
R2	0000 0002		16*	110	114	115	127	128	129	134	136	145	149	150	151
			153	154	155	156	158	160	164	179	182	183	184	187	188
			189	190	227	230	238	241	244	253	323	323	324	328	332
			333	343	345	346	348	349	367	369	370	410	411	413	414
			422	423	425	426	431	515	516	520	521	522	523	584	585
			599	601	610	751	751	752	803	803	804	808	810	811	813
			823	824	825	889	890	917	918	920	921	946	949	950	951
			956	958	965	971	972	976	977	979	980	983	985	986	987
			991	992	994	995	997	998	1000	1002	1005	1007	1015	1017	1018
			1021	1033	1295	1295	1301	1307	1312	1317					
R3	0000 0003		17*	111	112	113	180	181	182	186	187	189	192	281	282
			283	285	287	289	292	294	307	308	311	313	316	317	318
			319	324	326	328	330	336	337	341	342	346	370	371	372
			373	375	378	379	382	384	406	407	407	408	409	411	412
			414	417	420	421	423	426	428	429	430	431	456	457	459
			463	464	465	466	471	472	474	475	478	479	480	485	486
			492	493	495	496	499	500	501	504	505	560	561	562	563
			564	567	571	572	573	574	582	583	600	605	647	648	655
			664	665	666	670	671	684	685	688	733	739	743	744	746
			748	749	753	754	759	760	761	783	784	787	788	789	792
			794	797	804	806	811	812	814	815	817	820	821	822	836
			839	842	845	848	851	854	860	865	868	871	874	876	879
			882	884	887	890	894	895	896	899	900	901	903	904	907
			911	915	917	918	920	921	922	924	930	940	940	941	955
			970	972	974	977	980	982	983	984	985	986	987	990	991
			998	1002	1003	1005	1007	1008	1014	1017	1025	1026	1073	1079	1083
			1118	1121	1133	1145	1149	1151	1152	1154	1155	1157	1158	1159	1160
			1161	1162	1164	1165	1166	1173	1235	1237	1312	1313	1314	1315	1315
			1316	1317	1318	1319	1319	1320	1321	1322	1323	1324	1324	1325	1326
			1327	1328	1328	1329									
R4	0000 0004		18*	122	135	139	140	190	191	219	286	287	295	295	383
			385	460	461	469	472	488	489	493	514	515	517	518	520
			764	948	949	950	957	958	961	962	992	1015	1018	1072	1074
			1330	1333											
R5	0000 0005		19*	135	138	185	191	193	278	314	339	376	513	516	521
			523	588	589	590	599	603	608	780	795	818	947	952	954
			959	963	964	966	1062	1064	1068	1070	1077	1080	1081		
R6	0000 0006		20*	142	164	165	166	279	315	340	377	590	600	607	609

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SOP       0000 0008I      94*   828
SPACE     0000 0A44I     838    844    850    864    873    881   1040*
SRB       0000 04D6I     586*   591    592
SREAD     0000 0D0BI    1355*
STADD     0000 0D24I     608   1367*
START     0000 0000I      84*   422
STBKAD    0000 0A5CI     292    382   1062*
STCADR    0000 00C0       95*
STOP      0000 0D04I     223    224    597    683    747   1348*  1349
STPRIN    0000 0672I     753    756*
SVCERR    0000 0C4AI    1235   1283*
TETOS     0000 0000       13*    59
TRKDEN    0000 0D4EI     246    336    460    488    689   1107   1146   1381*
TTYAD     0000 0007I      90*   976
TTYLP     0000 099CI     973    978    990*
TTYLPA    0000 09A0I     991*
TTYRD     0000 0094       96*
TTYWR     0000 0098       97*   990
UPDTRN    0000 0D3CI    1373*
UPDTX2    0000 02A8I     327    332*
UPDTX3    0000 028CI     324*   334    344
UPDTX4    0000 02D4I     348    345*
UPDTX5    0000 028EI     339*   351
WDFT      0000 0AA4I     311    316    341    373    457    463    485    688    792    815    820   1107*  1149
                         1158
WDFT2     0000 0AC6I    1109   1119*
WDFTA     0000 0AACI    1110*
WRTEND    0000 0D1CI     560    567    684    748   1365*
X9C       0000 0BD0I    1237*  1240
XBC       0000 0B0EI    1242*  1245
XCC       0000 0BEEI    1247*  1250
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PROG= MDCBL      ASSEMBLED BY CAL 03-066R07-00   (32-BIT)

                          1             SCRAT                                                   MDL00010
                          2  MDCBL      PROG  MMD COMMON BOOT LOADER 06-176F03R02M96A13         MDL00020
                          3             CROSS                                                   MDL00030
                          4             SQCHK                                                   MDL00040
                          5             SQUEZ                                                   MDL00050
                          6             WIDTH 120                                               MDL00060
                          7             NORX3                                                   MDL00070
                          8             NLSTC                                                   MDL00080
                          9  *                                                                  MDL00090
                         10  * COPYRIGHT  C  PERKIN-ELMER CORPORATION  MAY 1979                 MDL00100
                         11  *                                                                  MDL00110
         0000 0000       12  R0         EQU    0                                                MDL00120
         0000 0001       13  R1         EQU    1                                                MDL00130
         0000 0002       14  R2         EQU    2                                                MDL00140
         0000 0003       15  R3         EQU    3                                                MDL00150
         0000 0004       16  R4         EQU    4                                                MDL00160
         0000 0005       17  R5         EQU    5                                                MDL00170
         0000 0006       18  R6         EQU    6                                                MDL00180
         0000 0007       19  R7         EQU    7                                                MDL00190
         0000 0008       20  R8         EQU    8                                                MDL00200
         0000 0009       21  R9         EQU    9                                                MDL00210
         0000 000A       22  RA         EQU    10                                               MDL00220
         0000 000B       23  RB         EQU    11                                               MDL00230
         0000 000C       24  RC         EQU    12                                               MDL00240
         0000 000D       25  RD         EQU    13                                               MDL00250
         0000 000E       26  RE         EQU    14                                               MDL00260
         0000 000F       27  RF         EQU    15                                               MDL00270
  0000R                  28             ORG    X'80'                                            MDL00280
  0080   2421            29             LIS    R2,1                                             MDL00290
  0082   2303            30             BS     BOOT                                             MDL00300
  0084   0100            31             DC     X'100'             SET PSW SAVE AREA             MDL00310
  0086   0108            32             DC     X'108'             SET REG SAVE AREA             MDL00320
  0088   4020 0022       33  BOOT       STH    R2,X'22'           REG SAVE FOR 16 BIT MACHINE   MDL00330
  008C   C850 0100       34             LHI    R5,X'100'          SET START ADDRESS             MDL00340
  0090   C860 0267       35             LHI    R6,DISBTE-DISBT+X'101' SET END ADDRESS           MDL00350
  0094   D340 0078       36  WTBOOT     LB     R4,X'78'           GET LOADER DEVICE ADDRESS     MDL00360
  0098   9D41            37  LEADER     SSR    R4,R1                                            MDL00370
  009A   2091            38             BTBS   9,1                                              MDL00380
  009C   9B4A            39             RDR    R4,RA                                            MDL00390
  009E   08AA            40             LDAR   RA,RA                                            MDL00400
* 00A0   2338            41             BZ     LEADEX                                           MDL00410
  00A2   D2A5 0000       42  GOOBYT     STB    RA,0(R5)           STORE THE BYTE                MDL00420
  00A6   2651            43             AIS    R5,1               INCREMENT THE LOC.            MDL00430
  00A8   0556            44             CLAR   R5,R6              EOM ?                         MDL00440
* 00AA   2039            45             BNE    LEADER             NO                            MDL00450
  00AC   4300 0100       46             B      X'100'             YES                           MDL00460
  00B0   C550 0100       47  LEADEX     CLHI   R5,X'100'                                        MDL00470
* 00B4   223E            48             BE     LEADER                                           MDL00480
* 00B6   220A            49             B      GOOBYT                                           MDL00490
                         50  *                                                                  MDL00500
                         51  *                                                                  MDL00510
                         52  *                                                                  MDL00520
                         53  *                                                                  MDL00530
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                                    54  *    BEFORE THIS BOOT LOADER IS EXECUTED THE DEVICE DEFINITION          MDL00540
                                    55  *   TABLE MUST BE SET UP AS FOLLOWS.                                    MDL00550
                                    56  *                                                                       MDL00560
                                    57  *                                    LOCATIONS                          MDL00570
                                    58  *     DEVICE            X'78'      X'7A'      X'7C'      X'7E'         MDL00580
                                    59  *                                                                       MDL00590
                                    60  *                                                                       MDL00600
                                    61  *                                                                       MDL00610
                                    62  *     DISC              YYZZ       DDTT       CCSS       00LL          MDL00620
                                    63  *                                                                       MDL00630
                                    64  *                                                                       MDL00640
                                    65  *         WHERE:      DD = THE DEVICE WITH THE MMD PACK                 MDL00650
                                    66  *                     CC = THE CONTROLLER ADDRESS                       MDL00660
                                    67  *                     TT = DISC TYPE INDICATOR                          MDL00670
                                    68  *                          31 = 2.5 MB DISC                             MDL00680
                                    69  *                          33 = 10 MB DISC                              MDL00690
                                    70  *                          35 = 67 MB DISC                              MDL00700
                                    71  *                          36 = 256 MB DISC                             MDL00710
                                    72  *                     SS = THE DISC SELCH ADDRESS                       MDL00720
                                    73  *                     YY = THE DEVICE ADDRESS OF THE DISC BOOT LOAD     MDL00730
                                    74  *                          DEVICE                                       MDL00740
                                    75  *                     ZZ = THE READ COMMAND FOR THE BOOT LOAD DEVICE    MDL00750
                                    76  *                     LL = THE LOADER INDICATOR                         MDL00760
                                    77  *                          00 = 16 BIT LOADER                           MDL00770
                                    78  *                          01 = 32 BIT LOADER                           MDL00780
                                    79  *                                                                       MDL00790
                                    80  *                                                                       MDL00800
                                    81  *                                                                       MDL00810
                                    82  *                                                                       MDL00820
                                    83  *                                                                       MDL00830
0038                                84          ORG   X'100'                                                    MDL00840
      0000 0100                     85  ORIGIN1 EQU   *                                                         MDL00850
      0000 0100                     86  DISBT   EQU   *                                                         MDL00860
0100  C8D0 00F0                     87          LHI   RD,X'F0'          LOAD PSW CONSTANT                       MDL00870
0104  954D                          88          EPSR  R4,RD             SWAP (DISABLE INTERRUPTS)               MDL00880
0106  D310 007D                     89          LB    R1,X'7D'          GET SELCH ADDRESS                       MDL00890
010A  2448                          90          LIS   R4,8              LOAD THE SELCH STOP COMMAND             MDL00900
010C  9E14                          91          OCR   R1,R4             STOP THE SELCH                          MDL00910
010E  D320 007A                     92          LB    R2,X'7A'          GET THE DEVICE ADDRESS                  MDL00920
0112  D330 007C                     93          LB    R3,X'7C'          GET THE CONTROLLER ADDRESS              MDL00930
0116  C840 00C8                     94          LHI   R4,X'C8'          LOAD CLEAR COMMAND                      MDL00940
011A  9E34                          95          OCR   R3,R4             CLEAR CONTROLLER                        MDL00950
011C  41F0 0200                     96          BAL   RF,FRSRW          WAIT FOR FRSRW                          MDL00960
0120  2441                          97          LIS   R4,1              LOAD RESTORE COMMAND                    MDL00970
0122  9E24                          98          OCR   R2,R4             RESTORE THE FILE                        MDL00980
0124  41F0 0200                     99          BAL   RF,FRSRW          WAIT FOR COMPLETE                       MDL00990
0128  D3B0 007B                    100          LB    RB,X'7B'          LOAD TYPE INDICATOR                     MDL01000
012C  2470                         101          LIS   R7,0              SET THE SECTOR TO 0                     MDL01010
012E  D380 01BC                    102          LB    R8,SOD            GET START                               MDL01020
0132  2490                         103          LIS   R9,0              SET HEAD TO 0                           MDL01030
0134  41F0 018E                    104          BAL   RE,READ           READ THE DIRECTORY                      MDL01040
                                   105  *                                                                       MDL01050
0138  24A8                         106          LIS   RA,8              SET POINTER                             MDL01060
013A  C8E0 4000                    107          LHI   RE,X'4000'        LOAD TEST CONSTANT                      MDL01070
013E  0AEE                         108          AAR   RE,RE             DOUBLE                                  MDL01080
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0140   2112           109            BMS   LD16              16 BIT BRANCH                        MDL01090
0142   26A8           110            AIS   RA,8              32 BIT-BUMP POINTER                  MDL01100
0144   D37A 024C      111  LD16      LB    R7,PDB+6(RA)      LOAD THE SECTOR NUMBER               MDL01110
0148   488A 024A      112            LH    R8,PDB+4(RA)      LOAD THE CYLINDER NUMBER             MDL01120
014C   D39A 024D      113            LB    R9,PDB+7(RA)      GET THE HEAD #                       MDL01130
0150   41E0 01BE      114            BAL   RE,READ           READ THE PROGRAM DEFINITION BLOCK    MDL01140
                      115  *                                                                      MDL01150
0154   D350 0259      116            LB    R5,PDB+19                                              MDL01160
0158   9158           117            DC    X'9158'                                                MDL01170
015A   D360 025A      118            LB    R6,PDB+20                                              MDL01180
015E   0656           119            OAR   R5,R6             R5 = THE STARTING ADDRESS            MDL01190
0160   4860 025C      120            LH    R6,PDB+22         R6 = THE ENDING ADDRESS              MDL01200
0164   C5B0 0002      121            CLHI  RB,2              CHECK TYPE INDICATOR                 MDL01210
* 0168   2187         122            BL    CONT1A            NOT MSM                              MDL01220
016A   C570 003F      123            CLHI  R7,63             MAXIMUM?                             MDL01230
* 016E   213A         124            BNE   CONT1             NO                                   MDL01240
0170   2691           125            AIS   R9,1              INCRIMENT HEAD                       MDL01250
0172   2470           126            LIS   R7,0              ZERO SECTOR                          MDL01260
* 0174   2308         127            B     CONT1B            SKIP                                 MDL01270
0176   C570 0017      128  CONT1A    CLHI  R7,23             MAXIMUM?                             MDL01280
017A   2134           129            BNES  CONT1             NO                                   MDL01290
017C   2691           130            AIS   R9,1              INCRIMENT HEAD                       MDL01300
017E   2470           131            LIS   R7,0              ZERO SECTOR                          MDL01310
0180   2302           132            BS    CONT1B            SKIP                                 MDL01320
0182   2671           133  CONT1     AIS   R7,1              BUMP TO NEXT SECTOR                  MDL01330
0184   41E0 01C6      134  CONT1B    BAL   RE,READ1   ------ GO READ THE MMD LOADER               MDL01340
                      135  *                                                                      MDL01350
                      136  *  CALCULATE CHKSUM                                                    MDL01360
                      137  *                                                                      MDL01370
0188   08D5           138            LDAR  RD,R5                                                  MDL01380
018A   07FF           139            XAR   RF,RF             ZERO THE CHKSUM ACCUM.               MDL01390
018C   D3ED 0000      140  CKLP      LB    RE,0(RD)                                               MDL01400
0190   07FE           141            XAR   RF,RE                                                  MDL01410
0192   26D1           142            AIS   RD,1                                                   MDL01420
0194   05D6           143            CLAR  RD,R6                                                  MDL01430
0196   2085           144            BLS   CKLP                                                   MDL01440
0198   2236           145            BES   CKLP                                                   MDL01450
019A   D3C0 025E      146            LB    RC,PDB+24         GET THE CHKSUM BYTE                  MDL01460
019E   05FC           147            CLAR  RF,RC                                                  MDL01470
01A0   0335           148            BER   R5                CHKSUM -OK - PASS CONTROL TO THE PROGRAMDL01480
                      149  *                                                                      MDL01490
01A2   24D1           150            LIS   RD,1              DISPLAY                              MDL01500
01A4   C8F0 0040      151            LHI   RF,X'40'                                               MDL01510
01A8   9EDF           152            OCR   RD,RF             THE CHKSUM                           MDL01520
01AA   C8F0 EE00      153            LHI   RF,X'EE00'                                             MDL01530
01AE   98DF           154            WHR   RD,RF                                                  MDL01540
01B0   07EE           155            XAR   RE,RE             ERROR CODE                           MDL01550
01B2   98DE           156            WHR   RD,RE                                                  MDL01560
01B4   C8F0 0080      157            LHI   RF,X'80'                                               MDL01570
01B8   9EDE           158            OCR   RD,RE                                                  MDL01580
01BA   2200           159  HERE      BS    HERE                                                   MDL01590
                      160  *                                                                      MDL01600
01BC   00             161  SOD       DB    0                                                      MDL01610
01BE                  162            ALIGN 2                                                      MDL01620
                      163  *                                                                      MDL01630
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                                                                              MDL02190
      0000 0245     LNZB     EQU    *-1                                       MDL02200
                             ALIGN  2                                         MDL02210
0246                PDB      DS     32                                        MDL02220
0246  0000 0266     DISBTE   EQU    *                                         MDL02230
                    *                                                         MDL02240
                             NOSQZ                                            MDL02250
0266  D360 007A     $PUNCH   LB     R6,X'7A'     GET BOUTDV (PUNCH) ADDRESS.  MDL02260
026A  DE60 007B              OC     R6,X'7B'     START TAPE PUNCH             MDL02270
026E  9D60                   SSR    R6,R0                                     MDL02280
0270  2081                   BTBS   8,1                                     E MDL02290
0272  41F0 02B4              BAL    RF,$TAPL     PUNCH LEADER                 MDL02300
0276  C810 0080              LHI    R1,X'80'     LOAD START                   MDL02310
027A  2421                   LIS    R2,1                                      MDL02320
027C  C830 00CF              LHI    R3,X'CF'                                  MDL02330
0280  DA61 0000     $PNCH1   WD     R6,0(R1)     PUNCH BOOT LOADER            MDL02340
0284  9D60                   SSR    R6,R0                                     MDL02350
0286  2081                   BTBS   8,1                                       MDL02360
0288  C110 0280              BXLE   R1,$PNCH1                               E MDL02370
028C  41F0 02BA              BAL    RF,$TAPL1    PUNCH ONE-FOLD GAP.          MDL02380
                    *                                                         MDL02390
0290  C810 0100              LDAI   R1,ORIGIN1   (NORMALLY X'A00')            MDL02400
0294  C830 0245              LDAI   R3,LNZB                                   MDL02410
0298  D351 0000     $PNCH2   LB     R5,0(R1)     PUNCH PROGRAM                MDL02420
029C  9A65                   WDR    R6,R5                                     MDL02430
029E  9D60                   SSR    R6,R0                                     MDL02440
02A0  2081                   BTBS   8,1                                       MDL02450
02A2  C110 0298              BXLE   R1,$PNCH2                               E MDL02460
02A6  41F0 02B4              BAL    RF,$TAPL     PUNCH TRAILER.               MDL02470
02AA  C810 0080              LHI    R1,X'80'                                  MDL02480
02AE  9411                   EXBR   R1,R1                                     MDL02490
02B0  9501                   EPSR   R0,R1        HALT PROCESSOR.              MDL02500
02B2  2200                   DCX    2200                                      MDL02510
                    *   CHKSUM/M17 PUNCHER  (CONTINUED)                       MDL02520
                    *                                                         MDL02530
                    *                                                         MDL02540
02B4  C800 0100     $TAPL    LHI    R0,256       TO PUNCH BLANK LEADER        MDL02550
02B8  2303                   BS     $TAPLP                                    MDL02560
                    *                                                         MDL02570
02BA  C800 0080     $TAPL1   LHI    R0,128       TO PUNCH 1-FOLD GAP+         MDL02580
                    *                                                         MDL02590
02BE  2701          $TAPLP   SIS    R0,1                                    E MDL02600
02C0  032F                   BNPR   RF           RETURN                       MDL02610
02C2  2430                   LIS    R3,0                                      MDL02620
02C4  9A63                   WDR    R6,R3        PUNCH BLANK FRAME            MDL02630
02C6  9D68                   SSR    R6,R8                                     MDL02640
02C8  2081                   BTBS   8,1                                       MDL02650
02CA  2206                   BS     $TAPLP       CONTINUE.                    MDL02660
                    *                                                         MDL02670
02CC                         END
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ASSEMBLED BY CAL 03-066R07-00 (32-BIT)

START OPTIONS: T=16,ERLST

NO CAL ERRORS
NO CAL WARNINGS
5 PASSES

$PNCH1	0000	0280	233*	236										
$PNCH2	0000	0298	241*	245										
$PUNCH	0000	0266	225*											
STAPL	0000	02B4	229	246	254*									
STAPL1	0000	02BA	237	257*										
STAPLP	0000	02BE	255	259*	265									
ABSTOP	0000	02CC												
ADC	0000	0002												
BOOT	0000	0088	30	33*										
CKLP	0000	018C	140*	144	145									
CONT1	0000	0182	124	129	133*									
CONT1A	0000	0176	122	128*										
CONT1B	0000	0184	127	132	134*									
DISBT	0000	0100	35	86*										
DISBTE	0000	0266	35	222*										
FRSRW	0000	0200	96	99	171	177	187	190*	199	202	206			
GOOBYT	0000	00A2	42*	49										
HERE	0000	01BA	159*	159										
IMPTOP	0000	0000R												
LADC	0000	0001												
LD16	0000	0144	109	111*										
LEADER	0000	0098	37*	45	48									
LEADEX	0000	00B0	41	47*										
LNZB	0000	0245	219*	240										
MSM	0000	020A	167	196*										
ORIGIN1	0000	0100	85*	239										
PDB	0000	0246	111	112	113	116	118	120	146	164	165	221*		
PURETOP	0000	0000R												
R0	0000	0000	12*	183	191	193	227	234	243	249	254	257	259	
R1	0000	0001	13*	37	89	91	178	179	182	183	186	212	213	217
			233	236	239	241	245	247	248	248	249			
R2	0000	0002	14*	29	33	92	98	168	170	193	196	198	201	203
			231											
R3	0000	0003	15*	93	95	176	180	191	207	211	215	232	240	261
R4	0000	0004	16*	36	37	39	88	90	91	94	95	97	98	169
			172	180	181	182	185	186	197	198	200	201	204	205
			215	216	217									
R5	0000	0005	17*	34	42	43	44	47	116	119	138	148	164	178
			241	242										
R6	0000	0006	18*	35	44	118	119	120	143	165	179	213	225	226
			233	234	242	243	262	263						
R7	0000	0007	19*	101	111	123	126	128	131	133	175	207		
R8	0000	0008	20*	102	112	168	196	210	263					
R9	0000	0009	21*	103	113	125	130	173	203	208				
RA	0000	000A	22*	39	40	40	42	106	110	111	112	113		
RB	0000	000B	23*	100	121	166								
RC	0000	000C	24*	146	147	173	175	176	208	210	211			

RD	0000 000D	25*	87	88	138	140	142	143	150	152	154	156	158	
RE	0000 000E	26*	104	107	108	108	114	134	140	141	155	155	156	158
		188												
READ	0000 01BE	104	114	164*										
READ1	0000 01C6	134	166*											
READ1B	0000 01F2	183*	218											
RF	0000 000F	27*	96	99	139	139	141	147	151	152	153	154	157	171
		177	187	195	199	202	206	229	237	246	260			
SOD	0000 01BC	102	161*											
WTBOOT	0000 0094	36*												