Program Number B06-177F02M99R04

MULTI-MEDIA DIAGNOSTIC GENERATOR (32-BIT)

Consists of:

Program Description	B06-177M95R04A15
Program Listing	06-177F02R04M91A13

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1. PROGRAM TITLE

Multi Media Diagnostic Generator (MDG)

06-177 F01 16 Bit Processors
06-177 F02 32 Bit Processors

2. PURPOSE OF THE PROGRAM

The MDG provides the facilities necessary to build and maintain Perkin-Elmer diagnostics on Multi Media. The need for a paper tape reader is eliminated. Programs can be loaded from the magnetic media using the Multi Media Diagnostic Loader (06-176 F01 or F02).

These programs support the following devices:

800 BPI Mag Tape
1600 BPI Mag Tape
INTERTAPE (cassette)
13.5 MB Disc
10 MB Disc
67 MB Disc
256 MB Disc

NOTE: The 13.5 MB disc is only supported on 32-bit systems.

3. MINIMUM HARDWARE REQUIRED

Processor - Any 16 bit with the Basic 7/16 instruction set.
- Any 32 Bit

Memory - 16 bit processor - 32KB
- 32 bit processor - 40KB

Console - TTY or CRT or Carousel 30 or Carousel 300, on CLI or PASLA or STC.

Loading Device - HSPTR/P or
- TTY
- Used to load some diagnostics for the CREATE mode.

Output Device - Mag Tape w/wo SELCH
- Cassette
- Disc and SELCH
- Used as the magnetic output device for the CREATE and COPY functions.

Input Device - Mag Tape w/wo SELCH
- Cassette
- Disc and SELCH
- Used as the input device for the COPY function.

4. REQUIREMENTS OF THE MDG SYSTEM

Manually enter the X'50' Sequence shown as followed, into memory:

```
X'30'      0
X'32'      0
X'34'      0
X'36'    X'50'
X'50'    X'D500'
X'52'    X'00CF'
X'54'    X'4300'
X'56'    X'0080'
```

5. LOADING PROCEDURES

5.1 Tape Format

The MDG is supported by two separate Relocatable programs; one for 32 bit processors, and one for 16 bit processors.

```
16 Bit 06-177 F01 M17
32 Bit 06-177 F02 M17
```

The Location start + X'10' contains the console device code. Refer to Appendix C for details and devices supported.

Execute the MDG at its start address. Observe the following title is printed on the console device.

```
MDG
*
```

6. OPERATOR COMMAND/OPTION INFORMATION

6.1 Command/Option Input Structure

An asterisk (*) is output to the console device to indicate that the program is awaiting operator input. All options must be typed in from the Console, followed by a space and the desired arguments separated by commas. A carriage return (CR) is issued to terminate every command/option input. An invalid command/option or value will cause a (?) followed by a carriage return (CR), line feed (LF), and an asterisk (*) to occur. If, during entry of the option, an error is made, it can be handled in one of two ways.

The hash mark (#) can be input to delete the entire line. This will cause a carriage return (CR), and line feed (LF), asterisk (*) to be output. The left arrow (←) or BS can be input to delete the previous caracters, or a string of characters can be deleted by inputting a (←) left arrow or BS for each character to be deleted.

6.2 Operator Commands/Options

The list of operator Commands/Options.

OUTDEV	RW - rewind
INDEV	FF - forward file
LIMITS	BF - backward file
SEQNAM	EOV - write EOV
CREATE	INIT
COPY	

6.2.1 OUTDEV (Select Output Device). This command specifies the device addresses associated with the output device. This option is required before most commands can be honored.

Format: OUTDEV n,aa,ss,cc(CR)

where: n-1 - 9 track mag tape
800 or 1600 BPI

2 - INTERTAPE

3 - 13.5 MB Disc

4 - 10 MB Disc

5 - 67 MB Disc

6 - 256 MB Disc

NOTE

Devices 3, 4, 5, and 6 must have SELCH specified.

aa - Device address

ss - SELCH address if device (aa) is on a SELCH If no selch enter carriage return (CR).

cc - Controller address if n is greater than 2. If no controller enter carriage return (CR).

Examples: Assign a Mag Tape at address X'95' no SELCH

OUTDEV 1,95(CR)

Assign the same Mag Tape but on SELCH X'F0'.

OUTDEV 1,95,FO(CR)

Assign INTERTAPE device X'45'.

OUTDEV 2,45(CR)

Assign a 13.5 MB disc-device X'FC' controller X'FB', and SELCH X'F0'.

OUTDEV 3,FC,F0,FB(CR)

Assign a fixed platter of 10MB disc-device address X'C9' - controller address X'B8' - as SELCH address X'F0'.

OUTDEV 4,C9,F0,B8(CR)

6.2.2 INDEV (Select Input device). This command specifies the device addresses associated with the input device. The option is used for the COPY function only.

Format: INDEV n,aa,ss,cc(CR)

where: n,aa,ss,cc are defined as in OUTDEV.

Examples: Assign a Mag Tape at address X'85' no SELCH

INDEV 1,85(CR)

Same Mag Tape on SELCH X'F0'

INDEV 1,85,F0(CR)

Assign INTERTAPE at address X'55'

INDEV 2,55(CR)

Assign the removable platter of a 10 MB disc-device address X'C8' - controller X'B8' and SELCH X'F2'.

INDEV 4,C8,F2,B8(CR)

6.2.3 INIT (Initialize the Media). The INIT command will prepare a virgin media for use. On a mag tape, it will write the boot loader. On a disc it will initialize the directory and verify the integrity of cylinders eight and nine. This command also establishes the first EOV needed by the CREATE and COPY functions.

To perform initialization observe the following:

Mag Tape or Cassette	Must be at "Load Point" "On-Line" NOT "Write Protected"
Disc	Must be "Ready" and NOT "Write Protected"

With the media in the above condition, enter the INIT command. At job completion, EOJ will be printed. The media is now ready for use by CREATE or COPY.

Example:
```
*INIT(CR)
EOJ
*
```

6.2.4 LIMITS (Select Low, High Program Addresses). The LIMITS option specifies the low and high boundaries of the core image to be copied. It is required only when the CREATE command is used.

Format: LIMITS llllll,hhhhh(CR)

where *llllll is the 5 digit LOW memory address.

*hhhhh is the 5 digit HIGH memory address.

*For MDG 16 Bit (06-177F01), this is a 4 digit address only.

Example: Set the limits for a program with starting address of X'0A00' and ending address of X'27C5'.

LIMITS A00,27C5(CR)

6.2.5 SEQNAM (Assign a sequence number, name). This option is used to assign a unique three digit sequence number, the program 06-# and revision, and the program name. The sequence number is used for program identification on the media, and is the only means for identification at load time. Multiple defined sequence numbers may cause errors. This option is set to zero after completion of a CREATE.

Format: SEQNAM sss,ppppp[.R] ,nnnnn...(CR)

where sss is a three digit sequence number.

ppppp is the combination of the program 06# and revision level. Its structure is the three digit 06#, followed by the two digit revision #. This field for program 06-122R03 would be 12203.

nnnnn... is a 30 character free format description field. A program's functional variation and name should be included here.

[.R] is the optional extension field representing the number of change page packages installed; this field will be zeroed when the program is revised; if the field is zero, it will not be printed when the media is listed.

Example: For the 06-156F01 the series 32 Memory Test Part 1.

```
SEQNAM  03A,15600,F01 MEMORY TEST PART 1(CR)
```

6.2.6 CREATE (Copy a memory resident program to a media). The CREATE command writes memory between the low and high addresses specified in the LIMITS option to the OUTDEV media as a core image.

Core image is absolute, and when reloaded, occupies the same memory locations as at the time of the CREATE. The only restraint on the CREATE function is that 16 and 32 bit loader format tapes must be CREATED on their respective processors. When the CREATE terminates, "EOJ" is printed on the console and the SEQNAM option is set to zero.

Format: CREATE(CR)

CREATE writes an EOV indicator after every program written. This EOV indicator is removed (by the program) before the next program is written.

Example:
```
*CREATE
EOJ
*
```

6.2.7 COPY (Copy a program from an existing media to another). The COPY command generates a core image output media. However, it is not generated from a memory resident program, but by transferring programs from a previously CREATED media, INDEV to OUTDEV. The COPY function has no restraints and will copy any previously made media to any output media. When COPY terminates, "EOJ" is printed on the console. If the COPY terminates at EOV, then "EOV" "EOJ" is printed. While COPY can be used to copy all or part of the media, the user must maintain the proper media format. See Appendix B.

During COPY, the sequence number of the program being copied is shown on the display panel.

Format: COPY nnn(CR)

where nnn is the sequence # where the COPY is to terminate. If it is desired to copy to EOV, the following format is used:

COPY EOV(CR)

Example: Copy all the programs up to sequence number 126 from INDEV to OUTDEV.

```
*COPY 126(CR)
EOJ
*
Copy all the program up to sequence number 92C
*COPY 92C(CR)
EOV
EOJ
*
(The above printout indicates that 92C was not
found on the INDEV.)
```

NOTE

If no I/O errors occur, all programs from the present program to EOV or end termination have been copied successfully.

Copy to EOV

```
*COPY EOV(CR)
EOV
EOJ
*
```

6.2.8 RW (REWIND). The RW command will rewind the specified device to the beginning of the media. This command must be used on both Mag Tape and Disc. The Mag Tape returns to BOT (beginning of tape) or the pointers for the Disc are set to zero. When the RW is complete, "EOJ" is printed on the console.

Format: RW x(CR)

where x=O (letter O) for the rewind of the media associated with OUTDEV.

X = I (letter I) for the rewind of the media associated with INDEV.

Example:

```
*RW O(CR)
EOJ

*RW I(CR)
EOJ
```

6.2.9 FF (FORWARD FILES). The FF command will forward files. The command terminates when the desired file is found, or EOV is detected. If the file is located, "EOJ" is printed on the console. If EOV is detected, "EOV" "EOJ" is printed.

Format: FF x,sss(CR)

where x = O (letter O) for the media associated with OUTDEV, and I (letter I) for the media associated with INDEV

xxx is the three digit sequence # of the program up to which the pointer is moved, or the tape is positioned.

Example:
```
*FF O,027(CR)          (number found)
EOJ
*
*FF I,196(CR)          (number not found)
EOV
EOJ
*
*FF O,EOV(CR)          (forward to EOV)
EOV
EOJ
*
```

6.2.10 BF (BACKWARD FILES). The BF command will back up files. The command terminates when the desired file is found or beginning of volume (BOV) is detected. If the file is located, "EOJ" is printed. If the file is not found, "BOV" "EOJ" is printed.

Format: BF x,sss(CR)

where x - O (letter O) for the OUTDEV media, and
I (letter I) for the INDEV media.

xxx is the three digit sequence number of the program being sought.

Examples:
```
*BF O,128(CR)          (number found)
EOJ
*
*BF I,007(CR)          (number not found)
EOV
EOJ
*
```

6.2.11 EOV (WRITE EOV). This command will write END OF VOLUME on the media. The command will be accepted only when the position of the media is known. This command is NOT for general usage. It's primary purpose is in error recovery and will be discussed further in section 8.

Format: EOV(CR)

Example:
```
*EOV(CR)
EOJ
```

7. OPERATING PROCEDURES

This section gives instructions for performing MDG operations. The following procedures are discussed.

1. Device Assignments
2. Media INITialization
3. CREATE - how to use the CREATE function
4. COPY - to transfer the programs to another media.

An example of the commands necessary to perform the above functions will follow. For these examples, mag tape address X'85' on SELCH X'F0' will be the OUTDEV. Throughout these examples, refer to Section 6 for details on Option/Commands information.

7.1 Device Assignments

Device assignments must be made as follows. Refer to Section 6.

OUTDEV - if the CREATE function is to be used.

INDEV and OUTDEV - if the COPY function is to be used.

Example:
```
MDG
*OUTDEV 1,85,FO (CR)
*INDEV 2,45(CR)
```

7.2 Media Initialization

If the media to be used on OUTDEV is a virgin media, it must be initialized. Initialization establishes known information on the media and provides the first EOV indicator.

Example:
```
MDG
OUTDEV 1,85,FO(CR)
*INIT
EOJ
*
```

7.3 Create

To CREATE on a media, the following steps should be followed:

1. Start MDG at its bias address.

2. Assign OUTDEV as outlined in Section 6.2.1.

3. FF (Forward Files) the media to EOV. See Section 6.2.9 if the media is a virgin media, it must be INITialized instead of FF. See Section 6.2.3.

4. Load the program to be put on the media. Load it as instructed for the program.

   NOTE: When building a new media, the first two programs written must be the 16 bit and 32 bit Multi-Media Diagnostic Loaders. Refer to Appendix B.

5. Start the MDG at its bias address.

6. Enter the LIMITS option. See Section 6.2.4.

7. Enter the SEQNAM option. See Section 6.2.5.

8. Enter the CREATE command. See Section 6.2.6. The program will be written to the OUTDEV media. When the CREATE is complete EOJ is printed on the console.

9. To write another program on the media, return to step '4'. When all programs are written, rewind the media. Use the RW command as directed in 6.2.8. Remove the media.

Example: To put the desired Multi-Media Diagnostic Loaders (16 and 32 Bit) on the media. The loaders must be the first programs on all media and should immediately follow INITialization. The number on the right indicates the procedure step being performed.

Load the 16 Bit MDB on a 16 Bit processor or 7/32 in HW mode. If building for use on only one type of processor, refer to Appendix B.

```
2.  *OUTDEV 1,85,FO(CR)
3.  *INIT(CR)
    EOJ
    *
4.  Load the 16 bit MDL.
5.  MDG
6.  *LIMITS 4000,4B4D
7.  *SEQNAM 001,17600,F01 MULTI MEDIA DI.LDR 16BIT(CR)
8.  *CREATE(CR)
    EOJ
9.  *RW O(CR)
    EOJ
    *
    (Remove Media)
```

Load the MDG on a 32 Bit machine and mount the media removed above.

```
1.  MDG
2.  *OUTDEV 1,85,FO(CR)
3.  *FF O,EOV(CR)
4.  Load the 32 bit MDL.
5.  MDG
6.  *LIMITS 6000,6C4E(CR)
7.  *SEQNAM 002,17600,F02 MULTI MEDIA DI LDR. 32 BIT(CR)
8.  *CREATE(CR)
    EOJ
9.  *RW O(CR)
    EOJ
    *
    (Remove Media)
```

Example: For this example the Disc Test/Formatter Program (06-122 R03) will be put on the media. The example media has been INITialized as in Section 6.2.3 and the 16 bit MDL has been prepared as shown in the previous example. The number on the left indicates the procedure step being performed.

```
1.  MDG
2.  *OUTDEV 1,85,FO(CR)
3.  *FF O,EOV(CR)
    EOJ
    *
4.  (Load the Disc Test/Formatter program using the
    Relocatable or General Loader) Relocation address -
    X'100'.
5.  MDG
6.  *LIMITS 100,22CE(CR)
7.  *SEQNAM 02C,12203,DISC TEST FORMAT/PROGRAM (CR)
8.  *CREATE(CR)
    EOJ
9.  *RW O(CR)
    EOJ
    *
    (Remove Media)
```

7.4 Copy

When using COPY be sure the required media format is maintained. See Appendix B. Follow the steps below to use COPY.

1. Start MDG at its bias.

2. Assign OUTDEV as in Section 6.2.1.

3. Assign INDEV as in Section 6.2.2.

4. FF (Forward Files) the INDEV to the desired starting position. See Section 6.2.9.

5. FF (Forward Files) the OUTDEV media to EOV. See Section 6.2.9. If the OUTDEV media is a virgin media, it must be INITialized instead of FF. See Section 6.2.3.

6. Enter the COPY command. See Section 6.2.7. The entire media from the current position (determined in step 5) to EOV can be copied, or individual programs or groups of programs can be selectively copied.

7. Rewind both medias.

Examples: To COPY the entire media to a virgin media, the INDEV is a Disc-device X'C8' - Controller X'B8' - SELCH X'FO'.

```
1.  MDG
2.  *OUTDEV 1,85,FO(CR)
3.  *INDEV 4,C8,FO,B8(CR)
4.  *FF I,001(CR)
    EOJ

5.  *INIT(CR)
    EOJ
6.  *COPY EOV(CR)
    EOV
    EOJ
7.  *RW O(CR)
    EOJ
    *RW I(CR)
    EOJ
    *
```

During the copy, the sequence numbers of the program are displayed on the display panel.

Example: Copy only one program #27 to OUTDEV from INDEV. Same devices as above.

```
1.  MDG
2.  *OUTDEV 1,85,FO(CR)
3.  *INDEV 4,C8,FO,B8(CR)
4.  *FF I,027(CR)
    EOJ
5.  *FF O,EOV(CR)
    EOJ
6.  *COPY 028(CR)
    EOJ
7.  *RW O(CR)
    EOJ
    *RW I(CR)
    EOJ
    *
```

8. ERRORS/ERROR RECOVERY

When Errors occur in the MDG system, a message is logged on the console device. These errors appear in two formats:

1. ERROR xxyy
   *

2. ERROR xxyy
   JOB ABORTED

This section gives a list of errors and prescribed error recovery.

8.1 Errors

The error formats of MDG are broken-down as follows:

ERROR xxyy

where xx - the device address if the error is device related or is zero if it is not a device oriented error.

yy - the Hex error code. Table 1 gives the complete list of codes.

8.2 Error Recovery

When error format (1) is output (see Section 8) the condition of the media(s) remains unchanged as no I/O operation was in progress. No recovery is required except to correct the error condition. However, if error format (2) is output (see Section 8), the condition of the media(s) is unknown. Recovery in this case is up to the operator. Follow these guidelines in error recovery of format (2).

1. Always BF (Backward Files) the media(s) to the last known good program on the media. If a COPY was in progress, BF (Backward Files) both medias. BF to the program number shown on the display panel.

   NOTE

   If a Disc is the OUTDEV in a COPY operation the BF command may yield the "EOV" "EOJ" response. If this occurs, BF the INDEV and continue to step 2.

2. If the error was other than X'E3', correct the error condition and restart the operation.

3. If the error is X'E3', the media must be terminated (EOV written). After step 1 above is complete, enter the EOV command, The media can no longer be used, unless the media error can be corrected or skipped over.

4. If the error is X'D3', the media must be terminated (EOV written). After step 1 above is complete, enter the EOV command. If the media is a mag tape, it is full and can no longer be used. If it is a cassette, one side is full. It can be flipped over and continued on the other side.

NOTE

For convenience, a cassette must have both the 16 bit and 32 bit MMDL's on both sides. See Appendix B.

TABLE 1

ERROR CODES

YY CODE #	MEANING
E0	OUTDEV Media not initialized, or Media at beginning of volume (BOV)
E1	Tape is not at BOT when INIT command issued
E2	Disc Pack Unusable under the MDG; cylinger 0 or 1 has a defective sector
E3	Unrecoverable Read/Write error.
E4	OUTDEV not assigned.
E5	INDEV not assigned.
E6	False sync from an address assigned in OUTDEV.
E7	False sync from and address assigned in INDEV.
E8	Disc Status Error; Seek Incomplete or Write Check or Write Protect.
E9	Device Write Protected.
EA	Wrong Disc Type specified in OUTDEV
EB	Invalid conditions for COPY; FILE marks found when not expected or disc "locked" or no sequence # match found.
EC	Disc Pack Full
ED	Directory Full

TABLE 1

ERROR CODES (Continued)

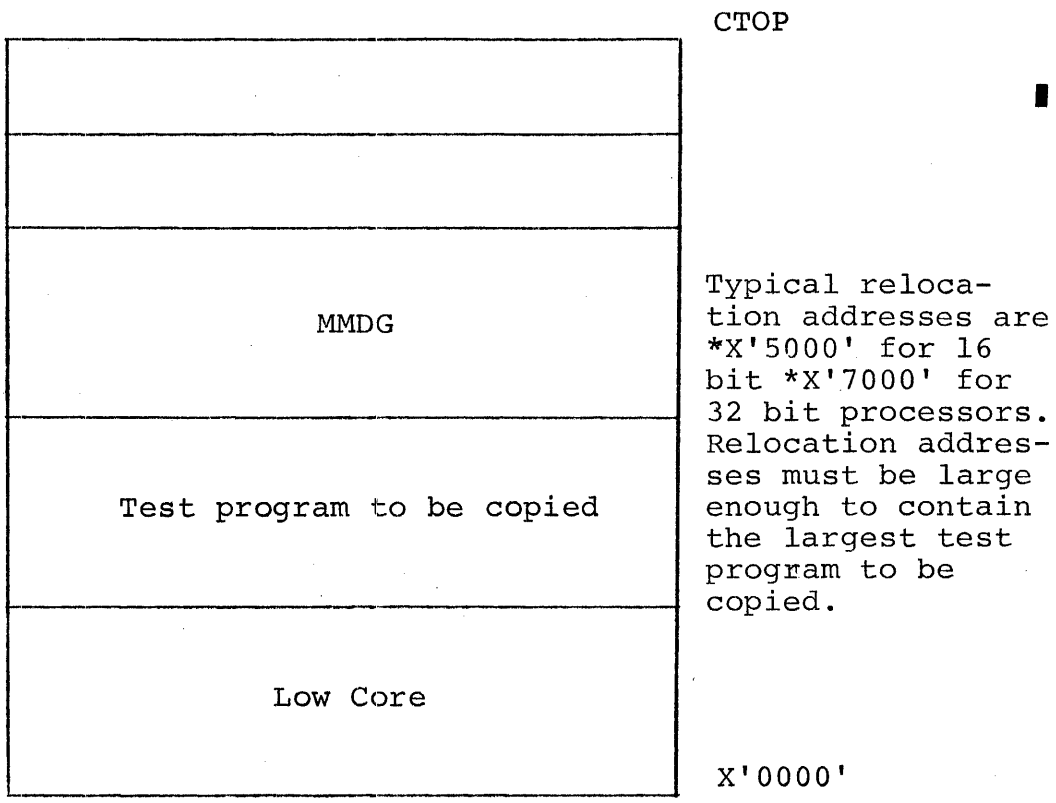
YY CODE #	MEANING
EE	"DU" from the device assigned in OUTDEV
EF	"DU" from the device assigned in INDEV.
D0	Copy parity error
D1	Invalid condition for EOV command; output device "locked". Use BF or FF before EOV command.
D2	Invalid or Unassigned SEQNAM
D3	END OF TAPE
D4	Sequence number already on the disc.
D5	OUTDEV = INDEV for COPY.
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)
F8	Boundary Error (Series 3200 only)

NOTE

When the position of either the input or output device is incorrect (not at BOT, BOV, or File Mark) the device is "locked" by the software; to correct this condition, position the file in question with a BF command.

APPENDIX A

MEMORY MAP FOR THE CREATE FUNCTION



*When the MMDG programs are made resident on the media; they are resident at these addresses.

APPENDIX B

The format of the media is essential. When reloading from the media the 16 bit MMDL (06-176F01) and the 32 bit MMDL (06-176F02) are assumed to reside as the first programs on the media. The format required on all media is as follows:

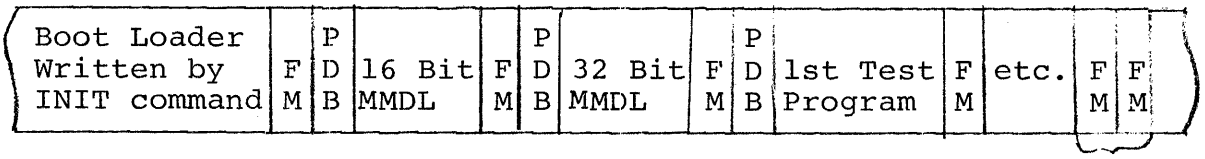
- Initialization of the media
- Generation of the 16 bit Multi-Media Diagnostic Loader (06-176F01) as the first program. It must have sequence #1.
- Generation of the 32 bit Multi Media Diagnostic Loader (06-176F02) as the second program. It must have sequence #2.

NOTE

If a media is being built to be used only on one type of processor, the appropriate Loader (06-176F01 or 06-176F02) must be put on the media twice, once with sequence #1 and once with sequence #2. This is required so that proper boot loading from the media can be accomplished.

- Generation of desired diagnostics.

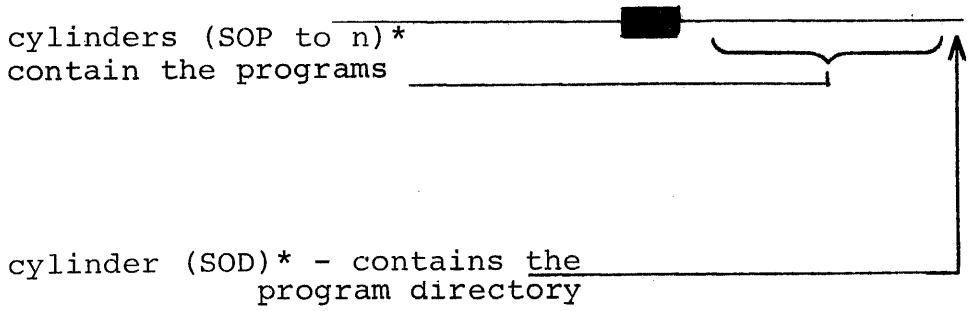
MAG TAPE/CASSETTE FORMAT



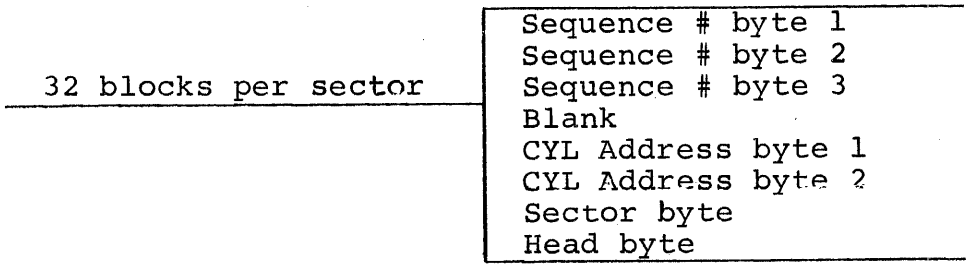
The Program Definition Block (PDB) contains all necessary information about the program that follows it.

A double file mark indicates EOV.

Disc Format



Directory Format - every sector of the directory is segmented into 32 parts. See the breakdown below. On INITialization, the directory is set to all zeros. As the programs are written, consecutive entries of the directory are filled. EOV on a disc is detected by zeros in the sequence number field.



* SOP (Start of Program) refers to the contents of the location labeled SOP in the listings.

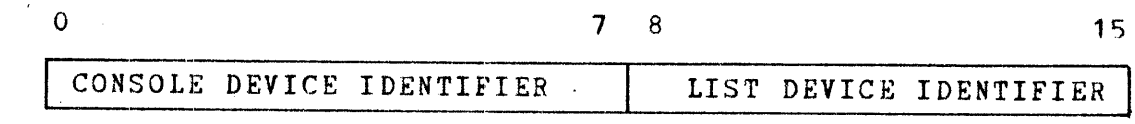
SOD (Start of Directory) refers to the contents of the location labeled SOD in the listings.

SOP and SOD can be any range (X'FF' maximum) within the limits of the disc used, and SOP must be greater than SOD. Loader/Generator compatibility requires SOP and SOD compatibility. In other words, if a parameter is changed in one, it must be changed in the other.

APPENDIX C

USER DEVICE DEFINITION

1. The halfword labeled IO (see the program listing) has the default value for a video display terminal on a PASLA/PALM/ Axynchronous Multiplexor interface as the console input-output device and the list device. If a different configuration is desired, location IO must be changed.



CONSOLE DEVICE IDENTIFIER	MEANING
X'01'	Video display terminal (GDT, CRT, or Model 550, 1100, or 1200 terminal) on a PASLA, PALM, or Asynchronous Multiplexor strapped for full duplex operation and highest baud rate.
X'02'	Teletype type device, video display terminal, or Carousel 15 or 30 on a current loop interface.
X'03'	Reserved; interpreted as X'02'.
X'04'	Carousel 300 on PASLA, PALM, or Asynchronous Multiplexor strapped for full duplex, highest baud rate.
X'00' and X'05' thru X'FF'	Reserved; interpreted as X'02'.

2. The video display terminal, if used on a PASLA, PALM, or Asynchronous Multiplexor, should be strapped for device addresses X'10' and X'11'. If the base address (X'10') is different, then the halfword labeled PASLADR (see the listing) must be changed.

3. The current loop interface, if used, should be strapped for device address X'02'. If it is different, the halfword labeled CLIFADR (see the listing) must be changed.

4. The line printer, if used, should be strapped for device address X'62'. If it is different, the halfword labeled LPADR (see the listing) must be changed.

5. The Carousel 300, if used on PASLA, PALM, or Asynchronous Multiplexor, should be strapped for device addresses X'10' and X'11'. If the base address (X'10') is different, the halfword labeled C300ADR (see the listing) must be changed.

```
PROG= MMDG       ASSEMBLED BY CAL 03-066R08-00   (32-BIT)
                                       SCRAT                                                 MDG00010
                                       CROSS                                                 MDG00020
                                       NORX3                                                 MDG00030
                                       SQUEZ                                                 MDG00040
                               *       SQCHK                                                 MDG00050
                                       WIDTH 120                                             MDG00060
000000I                                IFZ   ADC-2                                           MDG00070
                               MMDG    PROG  MMD GENERATOR 06-177F01R04M96A13                MDG00080
                                       ELSE                                                  MDG00090
                               MMDG    PROG  MMD GENERATOR 06-177F02R04M91A13                MDG00100
                                       ENDC                                                  MDG00110
                               *   MULTI - MEDIA DIAGNOSTIC GENERATOR   R04                  MDG00120
                               *                                                             MDG00130
                               * COPYRIGHT  C  PERKIN-ELMER CORPORATION  MAY 1979            MDG00140
                               *                                                             MDG00150
         0000 0000             R0      EQU   0                                               MDG00160
         0000 0001             R1      EQU   1                                               MDG00170
         0000 0002             R2      EQU   2                                               MDG00180
         0000 0003             R3      EQU   3                                               MDG00190
         0000 0004             R4      EQU   4                                               MDG00200
         0000 0005             R5      EQU   5                                               MDG00210
         0000 0006             R6      EQU   6                                               MDG00220
         0000 0007             R7      EQU   7                                               MDG00230
         0000 0008             R8      EQU   8                                               MDG00240
         0000 0009             R9      EQU   9                                               MDG00250
         0000 000A             RA      EQU   10                                              MDG00260
         0000 000B             RB      EQU   11                                              MDG00270
         0000 000C             RC      EQU   12                                              MDG00280
         0000 000D             RD      EQU   13                                              MDG00290
         0000 000E             RE      EQU   14                                              MDG00300
         0000 000F             RF      EQU   15                                              MDG00310
         0000 000F             LINK    EQU   15                                              MDG00320
000000I  4300 9ADA =001ADEI    START   B     LCORE                                           MDG00330
000004I                                DS    12                 FILLER                       MDG00340
                               *   TEST CONSTANTS                         *                  MDG00350
000010I  0101                  IO      DC    X'0101'            I/O DEVICE(S) IDENTIFIER     MDG00360
000012I  0010                  PASLADR DC    X'0010'            PALSA/PALM READ ADDRESS      MDG00370
000014I  0011                          DC    X'0011'            PASLA/PALM WRITE ADDRES#S    MDG00380
000016I  0002                  CLIFADR DC    X'0002'            CURRENT LOOP INTERFACE READ ADDRESS   MDG00390
000018I  0002                          DC    X'0002'            CURRENT LOOP INTERFACE WRITE ADDRESS  MDG00400
00001AI  0062                  LPADR   DC    X'0062'            DUMMY FOR LINE PRINTER       MDG00410
00001CI  0062                          DC    X'0062'            WRITE ADDRESS                MDG00420
00001EI  0010                  C300ADR DC    X'0010'            CAROUSEL/PASLA READ ADDRESS  MDG00430
000020I  0011                          DC    X'0011'            CAROUSEL/PASLA WRITE ADDRESS MDG00440
000022I  00C0                  MICROBUS DC   X'00C0'            MICROBUS READ ADDRESS        MDG00450
000024I  00C0                          DC    X'00C0'            MICROBUS WRITE ADDRESS       MDG00460
                               **IO =   0101  FOR CRT ON PASLA                               MDG00470
                               *        0202  FOR TELETYPE, CAROUSEL 15/30                   MDG00480
                               *        XX03  FOR LINE PRINTER                               MDG00490
                               *        0404  FOR CAROUSEL 300                               MDG00500
                               *        0505  FOR MICROBUS                                   MDG00510
                               *  ETPE IO COMMANDS                                           MDG00520
000026I  0000                  CONRADR DCX   0                  CONSOLE DEVICE READ ADDRESS  MDG00530
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000028I  0000                          54  CONWADR  DCX   0              CONSOLE DEVICE WRITE ADDRESS          MDG00540
00002AI  0000                          55  CONRD    DCX   0              CONSOLE READ/WRITE COMMANDS           MDG00550
         0000 002BI                    56  CONWRT   EQU   CONRD+1                                            MDG00560
00002CI  0000                          57  CON2ND   DCX   0                                                   MDG00570
00002EI  0000                          58  CONCMD   DCX   0              DUMMY HW AS POINTER                   MDG00580
000030I  A1A3                          59  CRTRD    DCX   A1A3           FOR CRT                               MDG00590
000032I  EE61                          60  CRT2ND   DCX   EE61                                                MDG00600
000034I  9498                          61  CLIFRD   DCX   9498           *   CURRENT LOOP INTERFACE            M G00610
000036I  0054                          62  CLIF2ND  DCX   0054                                                MDG00620
000038I  0080                          63  LPWRT    DCX   0080           *   LINE PRINTER                      MDG00630
00003AI  0000                          64           DCX   0              DUMMY FOR LP                          MDG00640
00003CI  A1A3                          65  CARRD    DCX   A1A3           *   CAROUSEL 300                      MDG00650
00003EI  F061                          66  CAR2ND   DCX   F061                                                MDG00660
000040I  8202                          67  MREADC   DCX   8202           *   MICROBUS                          MDG00670
000042I  0000                          68           DCX   0              DUMMY HW FOR MICROBUS                 MDG00680
000044I  00                            69  CONRQ2S  DB    0              CONSOLE REQUEST TO SEND CMD           MDG00690
000045I  23                            70  CRTRQ2S  DB    X'23'          FOR CRT                               MDG00700
000046I  00                            71           DB    0              *   DUMMY BYTE FOR CLI                MDG00710
000047I  00                            72           DB    0              *   DUMMY BYTE FOR LP                 MDG00720
000048I  23                            73  CARRQ2S  DB    X'23'          *   CAROUSEL 300                      MDG00730
000049I  00                            74           DB    0              *   DUMMY BYTE FOR MICROBUS           MDG00740
00004AI                                75           DB    *              (ALIGN ON HW BOUNDRY)                 MDG00750
00004AI  08                            76  SOD      DB    8              START OF DIRECTORY                    MDG00760
00004BI  09                            77  SOP      DB    9              START OF PROGRAM AREA                 MDG00770
         0000 004CI                    78  BEGIN    EQU   *                                                   MDG00780
00004CI  0744                          79           XAR   R4,R4                                               MDG00790
00004EI  D310 FFBE =000010I            80           LB    R1,IO          GET KEYBD TYPE                        MDG00800
000052I  1112                          81           SLLS  R1,2           MAKE FW INDEX                         MDG00810
000054I  4821 FFB8 =000010I            82           LH    R2,IO(R1)      GET WRITE ADDRESS                     MDG00820
000058I  4020 FFCC =000028I            83           STH   R2,CONWADR     SAVE                                  MDG00830
00005CI  4821 FFAE =00000EI            84           LH    R2,IO-2(R1)    GET READ ADDRESS                      MDG00840
000060I  4020 FFC2 =000026I            85           STH   R2,CONRADR     SAVE                                  MDG00850
000064I  D331 FFC5 =00002DI            86           LB    R3,CONCMD-1(R1)  GET WRITE CMD                       MDG00860
000068I  D230 FFBF =00002BI            87           STB   R3,CONWRT      SAVE                                  MDG00870
00006CI  D331 FFBC =00002CI            88           LB    R3,CONCMD-2(R1)  GET READ CMD                        MDG00880
000070I  D230 FFB6 =00002AI            89           STB   R3,CONRD       SAVE                                  MDG00890
000074I  D331 FFB6 =00002EI            90           LB    R3,CONCMD(R1)  GET 2ND CMD                           MDG00900
000078I  4030 FFB0 =00002CI            91           STH   R3,CON2ND      SAVE                                  MDG00910
00007CI  0833                          92           LDAR  R3,R3          SET CC                                MDG00920
00007EI  2332                          93           BZS   SKP2ND         SKIP SECOND COMMAND                   MDG00930
000080I  9E23                          94           OCR   R2,R3          ISSUE 2ND CMD                         MDG00940
000082I  D330 FFA5 =00002BI            95  SKP2ND   LB    R3,CONWRT      GET WRITE CMD                         MDG00950
000086I  9E23                          96           OCR   R2,R3          ISSUE CMD                             MDG00960
000088I  4130 9938 =0019C4I            97           BAL   R3,LOKOUT      LOCK THE OUTPUT DEVICE                MDG00970
00008CI  4130 9928 =0019B8I            98           BAL   R3,LOKIN       LOCK THE INPUT DEVICE                 MDG00980
000090I  4130 993C =0019D0I            99           BAL   R3,ZSEQ                                              MDG00990
000094I  E620 98BC =001954I           100           LDAI  R2,TITLE       PRINT THE TITLE                       MDG01000
000098I  4130 982A =0018C6I           101  REOPTX   BAL   R3,PRINT                                            MDG01010
         0000 009CI                   102  REOTTY   EQU   *                                                   MDG01020
00009CI  41E0 981C =0018BCI           103           BAL   RE,CRLF        DO CR/LF                              MDG01030
0000A0I                               104           IFNZ  ADC-2                                              MDG01040
0000A0I  2420                         105           LIS   R2,0           CLEAR                                 MDG01050
0000A2I  5020 0040                    106           ST    R2,X'40'       CLEAR S3200 INDICATOR                 MDG01060
                                      107           ENDC                                                     MDG01070
0000A6I  E620 9882 =00195CI           108           LDAI  R2,AST         PRINT AN *                            MDG01080
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0000AAI  4130 9818 =0018C6I   109  REDPT   BAL   R3,PRINT                                    MDGV1090
0000AEI  0744                 110          XAR   R4,R4          ZERO THE                    MDG01100
0000B0I  4040 A156 =0022VAI   111          STH   R4,EOJFLG      EOJ FLAG                    MDGV1110
0000B4I  0722                 112          XAR   R2,R2          BLANK                       MDG01120
0000B6I  C830 2020            113          LHI   R3,X'2020'     OUT                         MDG01130
0000BAI  4032 9E32 =001EF0I   114  REDINB   STH   R3,INBUF(R2)   THE                         MDGV1140
0000BEI  2622                 115          AIS   R2,2           BUFFER                      MDG01150
0000C0I  C520 0032            116          CLHI  R2,50                                       MDG01160
0000C4I  2085                 117          BLS   REDINB                                      MDG01170
0000C6I  4820 FF5C =000026I   118  REDAB    LH    R2,CONRADR     GET READ ADDRESS            MDG01180
0000CAI  D330 FF5C =00002AI   119          LB    R3,CONRD       GET READ CMD                MDG01190
0000CEI  9E23                 120          OCR   R2,R3          ISSUE CMD                   MDG01200
0000D0I  9D23                 121          SSR   R2,R3                                       MDG01210
0000D2I  2081                 122          BTBS  8,1            BUSY ?                      MDG01220
0000D4I  9B25                 123          RDR   R2,R5          NO - READ THE CHARACTER     MDG01230
0000D6I  4820 FF4E =000028I   124          LH    R2,CONWADR     GET WRITE ADDRESS           MDG01240
0000DAI  D330 FF4D =00002BI   125          LB    R3,CONWRT      GET WRITE COMMAND           MDG01250
0000DEI  9E23                 126          OCR   R2,R3          TURN LINE AROUND            MDG01260
0000E0I  9D23                 127          SSR   R2,R3          SENSE STATUS                MDG01270
0000E2I  2081                 128          BTBS  8,1            WAIT FOR BUSY NOT           MDG01280
0000E4I  9A25                 129          WDR   R2,R5          ECHO DATA                   MDG01290
0000E6I  C450 007F            130          NHI   R5,X'7F'       MASK OFF PARITY BIT         MDG01300
0000EAI  C550 0060            131          CLHI  R5,X'60'       LOWER CASE CHECK            MDG01310
*0000EEI 2183                 132          BL    NOECHO1        SKIP                        MDG01320
0000F0I  C850 0020            133          SHI   R5,X'20'       MAKE UPPER CASE             MDG01330
0000F4I  C550 0008            134  NOECHO1  CLHI  R5,X'08'       BS??                        MDG01340
0000F8I  4330 807C =000178I   135          BE    DELCHR         YES                         MDG01350
0000FCI  D254 9DF0 =001EF0I   136          STB   R5,INBUF(R4)   STORE THE BYTE              MDGV1360
000100I  C550 0023            137          CLHI  R5,X'23'       # ?                         MDG01370
000104I  4330 FF94 =00009CI   138          BE    REDTTY         YES - START THE INPUT OVER  MDG01380
000108I  C550 000D            139          CLHI  R5,X'0D'       CR ?                        MDG01390
00010CI  2336                 140          BES   REDAC          YES - GO LOOK FOR A         MDG01400
                              141  *                                 MATCH                  MDG01410
00010EI  2641                 142          AIS   R4,1                                        MDG01420
000110I  C540 0032            143          CLHI  R4,50          FIFTY CHARACTERS?           MDG01430
000114I  4280 FFAE =0000C6I   144          BL    REDAB          NO -                        MDG01440
                              145  *                           YES - LOOK FOR MATCH        MDG01450
                              146  *     R E D A C                                           MDG01460
                              147  *  CONTROL COMES HERE WHEN THE CR IS HIT ON OPTION ENTRY,OR MDG01470
                              148  *     THIRTY (30) CHARACTERS HAVE BEEN INPUT.             MDG01480
000118I  C810 2020            149  REDAC    LHI   R1,X'2020'     BLANK                       MDG01490
00011CI  4010 9EV8 =001F28I   150          STH   R1,CMD         OUT                         MDGV1500
000120I  4010 9EV6 =001F2AI   151          STH   R1,CMD+2       THE                         MDGV1510
000124I  4010 9EV4 =001F2CI   152          STH   R1,CMD+4       COMMAND                     MDGV1520
000128I  0711                 153          XAR   R1,R1          WORD                        MDG01530
00012AI  4010 9EV0 =001F2EI   154          STH   R1,CMD+6                                    MDG01540
00012EI  4130 9834 =001966I   155  CMDAB    BAL   R3,GETCHR                                   MDGV1550
000132I  C500 0020            156          CLHI  R0,X'20'       END OF NAME ?               MDG01560
000136I  2339                 157          BES   CMDAA          YES                         MDG01570
000138I  C500 000D            158          CLHI  R0,X'0D'       NAME ENDED BY CR ?          MDG01580
00013CI  2336                 159          BES   CMDAA          YES - GO MATCH IT           MDG01590
00013EI  D2V1 9DE5 =001F27I   160          STB   R0,CMD-1(R1)   NO - SAVE THE CHARACTER      MDGV1600
000142I  C510 0007            161          CLHI  R1,7           6 CHAR ?                    MDG01610
000146I  208C                 162          BLS   CMDAB          NO                          MDG01620
                              163  *                           YES                         MDG01630
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                              *   COMMAND NAME IS IN CMD, CMD+2, CMD+4                                  MDG01640
000148I  2528                 CMDAA     LCS   R2,8               SET UP THE POINTER                     MDG01650
00014AI  2628                 CMDAA1    AIS   R2,8               ADJUST POINTER                         MDG01660
00014CI  4802 803C =00018CI             LH    R0,INNAME(R2)      GET THE FIRST TWO CHARACTERS           MDG01670
000150I  4330 9820 =001974I             BZ    QUEST              ZERO? - END OF TABLE                   MDG01680
000154I  4500 9DD0 =001F28I             CLH   R0,CMD             EQUAL ?                                MDG01690
000158I  2037                           BNES  CMDAA1             NO - TRY AGAIN                         MDG01700
00015AI  4802 8030 =00018EI             LH    R0,INNAME+2(R2)    YES - GET THE NEXT TWO CHAR.           MDG01710
00015EI  4500 9DC8 =001F2AI             CLH   R0,CMD+2           EQUAL ?                                MDG01720
000162I  203C                           BNES  CMDAA1             NO - TRY AGAIN                         MDG01730
000164I  4802 8028 =000190I             LH    R0,INNAME+4(R2)    YES - GET THE NEXT TWO CHAR            MDG01740
000168I  4500 9DC0 =001F2CI             CLH   R0,CMD+4           EQUAL ?                                MDG01750
00016CI  4230 FFDA =00014AI             BNE   CMDAA1             NO - TRY AGAIN                         MDG01760
                              *                                  MATCH                                  MDG01770
000170I  4842 801E =000192I             LH    R4,INNAME+6(R2)    BRANCH TO THE ROUTINE SPECIFIED        MDG01780
000174I  4304 8014 =00018CI             B     INNAME(R4)         IN THE TABLE                           MDG01790
         0000 0178I           DELCHR    EQU   *                                                         MDG01800
000178I  0844                           LDAR  R4,R4              IS THE POINTER ZERO ?                ROMDG01810
00017AI  4330 FF48 =0000C6I             BZ    REDAB              YES - THEN NOTHING IN THE BUFFER.      MDG01820
00017EI  2741                           SIS   R4,1               NO - DECREMENT  COUNTER              ROMDG01830
000180I  C820 0020                      LHI   R2,X'20'           LOAD A SPACE                           MDG01840
000184I  D223 9D68 =001EF0I             STB   R2,INBUF(R3)       STORE THE SPACE                        MDG01850
000188I  4300 FF3A =0000C6I             B     REDAB              CONTINUE                               MDG01860
                              * ******************************************************************     MDG01870
                              *                                                                  *     MDG01880
                              *  O P T I O N   T A B L E                                         *     MDG01890
                              *                                                                  *     MDG01900
                              *         THIS TABLE CONTAINS THE 6 CHARACTER ASCII MNEMONIC OF THE *     MDG01910
                              *         OPTION, AND THE ADDRESS OF THE OPTION INPUT ROUTINE       *     MDG01920
                              *         DESIGNED TO HANDLE THAT PARTICULAR OPTION.                *     MDG01930
                              *                                                                  *     MDG01940
                              * ******************************************************************     MDG01950
00018CI  4F55 5444 4556       INNAME    DC    C'OUTDEV',Z(OUT-INNAME)                                   MDG01960
000192I  00CA
000194I  494E 4445 5620                 DC    C'INDEV ',Z(IN-INNAME)                                    MDG01970
00019AI  0180
00019CI  4C49 4D49 5453                 DC    C'LIMITS',Z(LIMITS-INNAME)                                MDG01980
0001A2I  005A
0001A4I  5345 514E 414D                 DC    C'SEQNAM',Z(SEQ-INNAME)                                   MDG01990
0001AAI  0494
0001ACI  4352 4541 5445                 DC    C'CREATE',Z(CREA-INNAME)                                  MDG02000
0001B2I  0084
0001B4I  5257 2020 2020                 DC    C'RW    ',Z(RW-INNAME)                                    MDG02010
0001BAI  0438
0001BCI  4646 2020 2020                 DC    C'FF    ',Z(FF-INNAME)                                    MDG02020
0001C2I  01C2
0001C4I  4246 2020 2020                 DC    C'BF    ',Z(BF-INNAME)                                    MDG02030
0001CAI  01B8
0001CCI  454F 5620 2020                 DC    C'EOV   ',Z(EV-INNAME)                                    MDG02040
0001D2I  03F4
0001D4I  434F 5059 2020                 DC    C'COPY  ',Z(COPY-INNAME)                                  MDG02050
0001DAI  0586
0001DCI  494E 4954 2020                 DC    C'INIT  ',Z(INIT-INNAME)                                  MDG02060
0001E2I  0C4C
0001E4I  0000                           DC    X'0000'                                                   MDG02070
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                              *  THE FOLLOWING ROUTINES ARE USED FOR SPECIFIC INPUT                  MDG02080
                              *        FUNCTIONS.  CONTROL COMES HERE AS A RESULT OF                 MDG02090
                              *          THE LABEL IN THE OPTION TABLE.                              MDG02100
                              * *****************************************************************   MDG02110
                              *                                                                 *   MDG02120
                              *  L I M I T S                                                    *   MDG02130
                              *                                                                 *   MDG02140
                              *        THIS ROUTINE WILL HANDLE THE INPUT OF THE LIMITS OPTION.  *   MDG02150
                              *                                                                 *   MDG02160
                              *        INPUT: R1 = THE CURRENT INCREMENT INTO THE INPUT BUFFER.  *   MDG02170
                              *                    IT POINTS TO THE FIRST CHARACTER TO BE USED   *   MDG02180
                              *                    AS DATA.                                     *   MDG02190
                              *                                                                 *   MDG02200
                              *       OUTPUT:  THE FOLLOWING LOCATIONS CONTAIN THE INPUT DATA   *   MDG02210
                              *                "LOW"  - THE LOW LIMIT ENTERED                   *   MDG02220
                              *                "HIGH" - THE HIGH LIMIT ENTERED                  *   MDG02230
                              *                                                                 *   MDG02240
                              *           THIS ROUTINE ALSO ROUNDS LOW AND HIGH TO A HALFWORD   *   MDG02250
                              *           BOUNDRY, AND TESTS THAT LOW < HIGH.                   *   MDG02260
                              *                                                                 *   MDG02270
                              * *****************************************************************   MDG02280
         0000 01E6I           LIMITS   EQU   *                                                      MDG02290
0001E6I  E640 9CE2 =001ECCI            LDAI  R4,LOW             SET THE DISTINATION ADDRESS         MDG02300
0001EAI  24E0                          LIS   RE,0               SET THE LOW FLAG                    MDG02310
0001ECI  0722                 LOHI     XAR   R2,R2              ZERO OUT THE ADDRESS ACCUMULATOR    MDG02320
0001EEI  5024 0000                     STA   R2,0(R4)                                               MDG02330
0001F2I                                IFNZ  ADC-2                                                  MDG02340
0001F2I  2456                          LIS   R5,6               SET THE CHARACTER COUNT             MDG02350
                                       ELSE                                                         MDG02360
                                       LIS   R5,5               SET THE CHARACTER COUNT             MDG02370
                                       ENDC                                                         MDG02380
0001F4I  4130 976E =001966I   LOHI1    BAL   R3,GETCHR          GET A CHARACTER                     MDG02390
0001F8I  C500 0020                     CLHI  R0,X'20'           SPACE ?                             MDG02400
0001FCI  4330 9774 =001974I            BE    QUEST              YES - PRINT "?"                     MDG02410
000200I  C500 000D                     CLHI  R0,X'0D'           CR ?                                MDG02420
000204I  4330 802C =000234I            BE    LOHIEN                                                 MDG02430
000208I  C500 002C                     CLHI  R0,C','            COMMA ?                             MDG02440
00020CI  233C                          BES   HIPRT                                                  MDG02450
00020EI  4130 9A7A =001C8CI            BAL   R3,ISHXCO          TRANSLATE ASCII TO HEX              MDG02460
000212I  1124                          SLLS  R2,4               SAVE                                MDG02470
000214I  0620                          OAR   R2,R0                                                  MDG02480
000216I  5024 0000                     STA   R2,0(R4)                                               MDG02490
00021AI  2751                          SIS   R5,1               MAX CHARACTERS ?                    MDG02500
00021CI  4230 FFD4 =0001F4I            BNZ   LOHI1              NO                                  MDG02510
000220I  4300 9750 =001974I            B     QUEST              YES - PRINT "?"                     MDG02520
000224I  08EE                 HIPRT    LDAR  RE,RE                                                  MDG02530
000226I  4230 974A =001974I            BNZ   QUEST                                                  MDG02540
00022AI  24E1                          LIS   RE,1               SET THE HIGH FLAG                   MDG02550
00022CI  E640 9CA0 =001ED0I            LDAI  R4,HIGH            SET THE DESTINATION ADDRESS         MDG02560
000230I  4300 FFB8 =0001ECI            B     LOHI               BRANCH TO COMMON ROUTINE            MDG02570
000234I  08EE                 LOHIEN   LDAR  RE,RE              WAS HIGH ENTERED                    MDG02580
000236I  4330 973A =001974I            BZ    QUEST              NO - ERROR                          MDG02590
00023AI  5800 9C8E =001ECCI            LDA   R0,LOW             GET THE LOW ADDRESS                 MDG02600
00023EI  1001                          SRLS  R0,1               MAKE IT EVEN                        MDG02610
000240I  1101                          SLLS  R0,1                                                   MDG02620
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                                                                                              MDG02630
000242I  5000 9C86 =001ECCI          STA   R0,LOW                                             MDG02640
000246I  5800 9C82 =001ECCI          LDA   R0,LOW              YES                            MDG02650
00024AI  5500 9C82 =001ED0I          CLA   R0,HIGH             IS LOW < HIGH ?                MDG02660
00024EI  4280 FE4A =00009CI          BL    REDTTY                                             MDG02670
000252I  4300 971E =001974I          B     QUEST                                              MDG02680
                              ************************************************************** MDG02690
                              *                                                            * MDG02700
                              *  O U T D E V                                               * MDG02710
                              *                                                            * MDG02720
                              *                                                            * MDG02730
                              *       THIS ROUTINE WILL HANDLE THE INPUT OF THE "OUTDEV" OPTION * MDG02740
                              *                                                            * MDG02750
                              *       INPUT: R1 = THE CURRENT INCREMENT INTO THE INPUT BUFFER, * MDG02760
                              *                  IT POINTS TO THE FIRST CHARACTER TO BE USED * MDG02770
                              *                  AS DATA.                                  * MDG02780
                              *                                                            * MDG02790
                              *      OUTPUT: THE FOLLOWING LOCATIONS CONTAIN THE INPUT DATA. * MDG02800
                              *              "OUTDEV"    - THE DEVICE INDICATOR            * MDG02810
                              *              "OUTDEV+2"  - THE DEVICE ADDRESS              * MDG02820
                              *              "OUTDEV+4"  - THE SELCH ADDRESS (IF OUTDEV NOT = 2 * MDG02830
                              *              "OUTDEV+6"  - THE CONTROLLER ADDRESS (IF OUTDEV > 2) * MDG02840
                              *                                                            * MDG02850
                              *            THIS ROUTINE VERIFIES THAT:                     * MDG02860
                              *             1. A SELCH IS NOT INDICATED WITH A CASSETTE    * MDG02870
                              *             2. A SELCH AND CONTROLLER ARE INDICATED ON A DISC * MDG02880
                              *                                                            * MDG02890
                              ************************************************************** MDG02900
          0000 0256I          OUT      EQU   *                                                MDG02910
000256I  E640 9C7E =001ED8I            LDAI  R4,OUTDEV         SET THE DESTINATION ADDRESS    MDG02920
00025AI  2451                 OUINA    LIS   R5,1              SET THE ROUTINE INDICATOR      MDG02930
00025CI  08F4                          LDAR  RF,R4                                            MDG02940
00025EI  0874                          LDAR  R7,R4                                            MDG02950
000260I  0788                          XAR   R8,R8                                            MDG02960
000262I  4087 0000            OUINL    STH   R8,0(R7)                                         MDG02970
000266I  2672                          AIS   R7,2                                             MDG02980
000268I  C574 0008                     CLHI  R7,8(R4)                                         MDG02990
00026CI  2035                          BNES  OUINL                                            MDG03000
00026EI  4130 96F4 =001966I   OUIN     BAL   R3,GETCHR         GET A CHARACTER                MDG03010
000272I  C500 0020                     CLHI  R0,X'20'          SPACE ?                        MDG03020
000276I  4330 96FA =001974I            BE    QUEST             YES - PRINT "?"                MDG03030
00027AI  C500 002C                     CLHI  R0,C','           COMMA ?                        MDG03040
00027EI  4330 8032 =0002B4I            BE    OUINFL            YES - GO PROCESS THE NEXT FIELD MDG03050
000282I  C500 000D                     CLHI  R0,X'0D'          CR                             MDG03060
000286I  4330 8052 =0002DCI            BE    CHKIOF            YES                            MDG03070
00028AI  C550 0001                     CLHI  R5,1              NO - FIRST FIELD ?             MDG03080
00028EI  2333                          BES   OUIN1                                            MDG03090
000290I  4300 96E0 =001974I            B     QUEST                                            MDG03100
000294I  4130 99F4 =001C8CI   OUIN1    BAL   R3,ISHXCO                                        MDG03110
000298I  0800                          LDAR  R0,R0             = ZERO ?                       MDG03120
00029AI  4330 96D6 =001974I            BZ    QUEST             YES - INVALID                  MDG03130
00029EI  C500 0007                     CLHI  R0,X'7'           < 7 ?                          MDG03140
0002A2I  2183                          BLS   OUIN2                                            MDG03150
0002A4I  4300 96CC =001974I            B     QUEST                                            MDG03160
0002A8I  4004 0000            OUIN2    STH   R0,0(R4)                                         MDG03170
0002ACI  2651                          AIS   R5,1
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0002AEI  0870                    318           LDAR  R7,R0                                                    MDG03180
0002B0I  4300 FF8A =00026EI      319           B     OUIN                                                     MDG03190
0002B4I  C550 0005               320  OUINFL   CLHI  R5,5          EXCEEDED MAXIMUM # OF FIELDS             MDG03200
0002B8I  4330 96B8 =001974I      321           BE    QUEST         YES                                      MDG03210
0002BCI  2642                    322  IOFUN2   AIS   R4,2          BUMP POINTER BY 2                        MDG03220
0002BEI  0722                    323           XAR   R2,R2                                                   MDG03230
0002C0I  2462                    324           LIS   R6,2                                                     MDG03240
0002C2I  4130 96A0 =001966I      325  OUINX    BAL   R3,GETCHR       GET CHARACTER                            MDG03250
0002C6I  4130 99C2 =001C8CI      326           BAL   R3,ISHXCO       CONVERT                                  MDG03260
0002CAI  1124                    327           SLLS  R2,4            SAVE                                     MDG03270
0002CCI  0620                    328           OAR   R2,R0                                                    MDG03280
0002CEI  4024 0000               329           STH   R2,0(R4)        STORE                                    MDG03290
0002D2I  2761                    330           SIS   R6,1            MORE CHAR ?                              MDG03300
0002D4I  2039                    331           BNZS  OUINX           YES                                      MDG03310
0002D6I  2651                    332           AIS   R5,1            NO - BUMP FUNCTION COUNT                 MDG03320
0002D8I  4300 FF92 =00026EI      333           B     OUIN                                                     MDG03330
0002DCI  C550 0003               334  CHKIOF   CLHI  R5,3                                                    MDG03340
0002E0I  4280 9690 =001974I      335           BL    QUEST                                                    MDG03350
0002E4I  C570 0003               336           CLHI  R7,X'03'                                                 MDG03360
0002E8I  4280 8028 =000314I      337           BL    CHKIO1                                                   MDG03370
0002ECI  C550 0005               338           CLHI  R5,X'05'                                                 MDG03380
0002F0I  4230 9680 =001974I      339           BNE   QUEST                                                    MDG03390
0002F4I  F5F0 0000 1ED8I         340           CLAI  RF,OUTDEV       SHOULD TRKDEN - MAXCYL BE UPDATED        MDG03400
0002FAI  2333                    341           BES   OUTMX           OUTDEV                                   MDG03410
0002FCI  24F2                    342           LIS   RF,2            SET THE INDEV INDICATOR                  MDG03420
0002FEI  2302                    343           BS    UPCHKCOM                                                 MDG03430
000300I  07FF                    344  OUTMX    XAR   RF,RF           SET THE OUTDEV INDICATOR                 MDG03440
         0000 0302I              345  UPCHKCOM EQU   *                                                        MDG03450
000302I  0A77                    346           AAR   R7,R7           DOUBLE DEVICE POINTER                    MDG03460
000304I  4897 8026 =00032EI      347           LH    R9,CYLTAB(R7)   LOAD MAXCYL                              MDG03470
000308I  407F 9EB8 =0021C4I      348           STH   R7,TRKDEN(RF)   SAVE                                     MDG03480
00030CI  409F 9EB8 =0021C8I      349           STH   R9,MAXCYL(RF)   SAVE                                     MDG03490
000310I  4300 FD88 =00009CI      350           B     REDTTY                                                   MDG03500
000314I  C550 0005               351  CHKIO1   CLHI  R5,X'05'       < 3 - SHOULD NOT HAVE 4 FIELDS           MDG03510
000318I  4330 9658 =001974I      352           BE    QUEST           = 4 - NG                                 MDG03520
00031CI  C570 0002               353           CLHI  R7,2            CASSETTE ?                               MDG03530
000320I  2135                    354           BNES  CHKCMD          NO                                       MDG03540
000322I  C550 0003               355           CLHI  R5,3            YES - MORE THAN TWO FIELDS ?             MDG03550
000326I  4230 964A =001974I      356           BNE   QUEST           YES - ERROR                              MDG03560
00032AI  4300 FD6E =00009CI      357  CHKCMD   B     REDTTY          NO - RETURN                              MDG03570
00032EI  0000                    358  CYLTAB   DC    H'0'            0                                        MDG03580
000330I  0000                    359           DC    H'0'            1                                        MDG03590
000332I  0000                    360           DC    H'0'            2                                        MDG03600
000334I  0336                    361           DC    H'822'          3=13.5 MB DISK                  R04      MDG03610
000336I  0197                    362           DC    H'407'          4=10 MB DISK                             MDG03620
000338I  0336                    363           DC    H'822'          5=80 MB DISK                             MDG03630
00033AI  0336                    364           DC    H'822'          6=300 MB DISK                            MDG03640
                                 365  ********************************************************************** MDG03650
                                 366  *                                                                    * MDG03660
                                 367  *  I N D E V                                                         * MDG03670
                                 368  *                                                                    * MDG03680
                                 369  *                                                                    * MDG03690
                                 370  *        THIS ROUTINE WILL HANDLE THE INPUT OF THE "INDEV" OPTION     * MDG03700
                                 371  *                                                                    * MDG03710
                                 372  *        INPUT: R1 = THE CURRENT INCREMENT INTO THE INPUT BUFFER,     * MDG03720
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                                373  *                  IT POINTS TO THE FIRST CHARACTER TO BE USED       *  MDG03730
                                374  *                  AS DATA.                                         *  MDG03740
                                375  *                                                                   *  MDG03750
                                376  *       OUTPUT: THE FOLLOWING LOCATIONS CONTAIN THE INPUT DATA.      *  MDG03760
                                377  *               "INDEV"    - THE DEVICE INDICATOR                   *  MDG03770
                                378  *               "INDEV+2"  - THE DEVICE ADDRESS                     *  MDG03780
                                379  *               "INDEV+4"  - THE SELCH ADDRESS (IF INDEV  = 1,3,4)  *  MDG03790
                                380  *               "INDEV+6"  - THE CONTROLLER ADDRESS (IF INDEV = 3,4) *  MDG03800
                                381  *                                                                   *  MDG03810
                                382  *             THIS ROUTINE VERIFIES THAT:                           *  MDG03820
                                383  *             1. A SELCH IS NOT INDICASTED WITH A CASSETTE          *  MDG03830
                                384  *             2. A SELCH AND CONTROLLER ARE INDICATED ON A DISC     *  MDG03840
                                385  *                                                                   *  MDG03850
                                386  ***********************************************************************  MDG03860
                                387  IN       EQU   *                                                        MDG03870
00033CI  E640 9BA0 =001EE0I     388           LDAI  R4,INDEV          SET THE DESTIV                         MDG03880
000340I  4300 FF16 =00025AI     389           B     OUINA                                                    MDG03890
                                390  * ********************************************************************  MDG03900
                                391  *                                                                      MDG03910
                                392  *  B F                                                                 MDG03920
                                393  *                                                                      MDG03930
                                394  *    BACKSPACE FILE MARK                                               MDG03940
                                395  *                                                                      MDG03950
                                396  *                                                                   *  MDG03960
                                397  *       THIS ROUTINE WILL BACK UP FILES UNTIL THE DESIRED            *  MDG03970
                                398  *       FILE NUMBER IS FOUND OR UNTIL BOT.                          *  MDG03980
                                399  *                                                                   *  MDG03990
                                400  *       INPUT: R1 = THE CURRENT INCREMENT INTO THE INPUT BUFFER,     *  MDG04000
                                401  *                   IT POINTS TO THE FIRST CHARACTER TO BE USED      *  MDG04010
                                402  *                   FOR THE DEVICE IDENTIFIER (0 OR 1).             *  MDG04020
                                403  *                                                                   *  MDG04030
                                404  *       OUTPUT: THE MEDIA WILL BE HANDLED AS FOLLOWS                *  MDG04040
                                405  *              MAG TAPE: BACKED UP TO THE DESIRED FILE OR BOT.      *  MDG04050
                                406  *              DISC:     THE DIRECTORY IS SEARCHED TO SEE IF       *  MDG04060
                                407  *                        THE NUMBER EXISTS ON THE DISC.            *  MDG04070
                                408  *             IF THE NUMBER IS FOUND "EOJ" IS PRINTED ON THE       *  MDG04080
                                409  *             CONSOLE. IF THE NUMBER IS NOT FOUND "ERROR" - "EOJ"  *  MDG04090
                                410  *             IS PRINTED ON THE CONSOLE FOR MAG TAPE, AND "EOV" -  *  MDG04100
                                411  *             "EOJ" IS PRINTED IF A DISC.                          *  MDG04110
                                412  *             THE LOCK WORD FOR THE APPROPRIATE DEVICE IS UPDATED  *  MDG04120
                                413  *             WITH THE NUMBER IF THE NUMBER WAS FOUND, OR LOCKED   *  MDG04130
                                414  *             IF EOV OR AN ERROR IS DETECTED.                      *  MDG04140
                                415  *                                                                   *  MDG04150
                                416  * ********************************************************************  MDG04160
0003444I  243F                  417  BF       LIS   R3,15             SET THE BACKSPACE FILE MARK FLAG       MDG04170
0003464I  2440                  418           LIS   R4,0              RESET THE BACKSPACE FLAG               MDG04180
0003484I  4040 9EAE =0021FAI    419           STH   R4,BKSPFL                                                MDG04190
00034CI   2302                  420           BS    BBFB                                                     MDG04200
                                421  * ********************************************************************  MDG04210
                                422  *                                                                      MDG04220
                                423  *  F F                                                                 MDG04230
                                424  *                                                                      MDG04240
                                425  *    FORWARD FILEMARK                                                  MDG04250
                                426  *                                                                   *  MDG04260
                                427  *       THIS ROUTINE WILL FORWARD FILES UNTIL THE DESIRED            *  MDG04270
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                                428  *        FILE NUMBER IS FOUND OR UNTIL EOV.                                  *  MDG04280
                                429  *                                                                            *  MDG04290
                                430  *        INPUT: R1 = THE CURRENT INCREMENT INTO THE INPUT BUFFER.           *  MDG04300
                                431  *                    IT POINTS TO THE FIRST CHARACTER TO BE USED            *  MDG04310
                                432  *                    FOR THE DEVICE IDENTIFIER (0 OR 1) .                  *  MDG04320
                                433  *                                                                          *  MDG04330
                                434  *       OUTPUT: THE MEDIA WILL BE HANDLED AS FOLLOWS                       *  MDG04340
                                435  *               MAG TAPE: FORWARD TO THE DESIRED FILE OR EOV.              *  MDG04350
                                436  *               DISC:     THE DIRECTORY IS SEARCHED TO SEE IF             *  MDG04360
                                437  *                         THE NUMBER EXISTS ON THE DISC.                  *  MDG04370
                                438  *             IF THE NUMBER IS FOUND "EOJ" IS PRINTED ON THE              *  MDG04380
                                439  *             CONSOLE. IF THE NUMBER IS NOT FOUND "EOV" - "EOJ"           *  MDG04390
                                440  *             IS PRINTED ON THE CONSOLE.                                  *  MDG04400
                                441  *             THE LOCK WORD FOR THE APPROPIATE DEVICE IS UPDATED          *  MDG04410
                                442  *             WITH THE NUMBER IF THE NUMBER WAS FOUND, OR LOCKED          *  MDG04420
                                443  *             IF EOV IS DETECTED.                                         *  MDG04430
                                444  *                                                                         *  MDG04440
                                445  * ********************************************************************** *  MDG04450
     0000 034EI                 446  FF       EQU   *                                                            MDG04460
00034EI 2430                    447           LIS   R3,0                    SET THE FORWARD FILE MARK FLAG       MDG04470
000350I 4030 9EA2 =0021F6I      448  BBFB     STH   R3,FFBFFL               SAVE THE FLAG                        MDG04480
000354I 2441                    449           LIS   R4,1                    SET THE EOJ                          MDG04490
000356I 4040 9EB0 =0022DAI      450           STH   R4,EOJFLG               FLAG                                 MDG04500
00035AI 4130 9608 =001966I      451           BAL   R3,GETCHR               GET A CHARACTER                      MDG04510
00035EI 24AF                    452           LIS   RA,15                   SET THE I INDICATOR                  MDG04520
000360I C500 0049               453           CLHI  R0,C'I'                 I ?                                  MDG04530
000364I 4330 807E =0003E6I      454           BE    FFCOMI                  YES                                  MDG04540
000368I 24A0                    455           LIS   RA,0                    NO - SET THE O INDICATOR             MDG04550
00036AI C500 004F               456           CLHI  R0,C'O'                 O ?                                  MDG04560
00036EI 4230 9602 =001974I      457           BNE   QUEST                                                        MDG04570
000372I 24F0                    458           LIS   RF,0                    CLEAR FLAG                           MDG04580
000374I 4130 95EE =001966I      459  FFCOM    BAL   R3,GETCHR               GET NEXT CHARACTER                   MDG04590
000378I C500 002C               460           CLHI  R0,C','                 COMMA ?                              MDG04600
00037CI 4230 95F4 =001974I      461           BNE   QUEST                   NO                                   MDG04610
000380I 2450                    462           LIS   R5,0                    YES                                  MDG04620
000382I 4130 95E0 =001966I      463  FFMORE   BAL   R3,GETCHR               GET THE NUMBER                       MDG04630
000386I C500 000D               464           CLHI  R0,X'0D'                CR                                   MDG04640
00038AI 4330 805E =0003ECI      465           BE    FFIT                    YES                                  MDG04650
00038EI C550 0003               466           CLHI  R5,3                    NO - TOO MANY CHAR ?                 MDG04660
000392I 4330 95DE =001974I      467           BE    QUEST                   YES                                  MDG04670
000396I 0870                    468           LDAR  R7,R0                   NO - HEX CHAR ?                      MDG04680
000398I C570 004F               469           CLHI  R7,C'O'                 IS IT O ?                            MDG04690
00039CI 2338                    470           BES   TSTEOV                                                       MDG04700
00039EI 4130 98EA =001C8CI      471           BAL   R3,ISHXCO                                                    MDG04710
0003A2I D275 9E1A =0021C0I      472           STB   R7,PGMNUM(R5)            YES                                  MDG04720
0003A6I 2651                    473           AIS   R5,1                                                        MDG04730
0003A8I 4300 FFD6 =000382I      474           B     FFMORE                                                     MDG04740
0003ACI C550 0001               475  TSTEOV   CLHI  R5,1                                                       MDG04750
0003B0I 4230 95C0 =001974I      476           BNE   QUEST                                                      MDG04760
0003B4I 4830 9E3E =0021F6I      477           LH    R3,FFBFFL                                                  MDG04770
0003B8I 4230 95B8 =001974I      478           BNZ   QUEST                                                      MDG04780
0003BCI D330 9E00 =0021C0I      479           LB    R3,PGMNUM                                                  MDG04790
0003C0I C530 0045               480           CLHI  R3,C'E'                                                    MDG04800
0003C4I 4230 95AC =001974I      481           BNE   QUEST                                                      MDG04810
0003C8I 4130 959A =001966I      482           BAL   R3,GETCHR                                                  MDG04820
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0003CCI  C500 0056                   CLHI  R0,C'V'         IS IT V ?
0003D0I  4230 95A0 =001974I          BNE   QUEST           NO
0003D4I  C800 3030                   LHI   R0,X'3030'
0003D8I  4000 9DE4 =0021C0I          STH   R0,PGMNUM
0003DCI  D200 9DE2 =0021C2I          STB   R0,PGMNUM+2
0003E0I  2453                        LIS   R5,3
0003E2I  4300 FF9C =000382I          B     FFMORE
0003E6I  24F2               FFCOMI   LIS   RF,2            SET FLAG
0003E8I  4300 FF88 =000374I          B     FFCOM
0003ECI  C550 0003          FFIT     CLHI  R5,3            COUNT = 3
0003F0I  4230 9580 =001974I          BNE   QUEST           NO
0003F4I  40A0 9E06 =0021FEI          STH   RA,IOFLAG
0003F8I  08AA                        LDAR  RA,RA           YES - SET CONDITION
0003FAI  2136                        BNZS  FFIT1
0003FCI  4130 95C4 =0019C4I          BAL   R3,LOKOUT
000400I  4130 937E =001782I          BAL   R3,LODAD        ZERO THE FF THE OUTDEV
000404I  2305                        BS    FFIT2
000406I  4130 95AE =0019B8I FFIT1    BAL   R3,LOKIN        LOCK THE INPUT DEVICE
00040AI  4130 93EC =0017FAI          BAL   R3,LIDAD        LOAD THE INPUT ADDRESSES
00040EI  DEA0 9498 =0018AAI FFIT2    OC    RA,DISABL       IDSABLE INT
000412I  C510 0003                   CLHI  R1,X'3'         TAPE ?
000416I  4380 8098 =0004B2I          BNL   FFDISC          NO - DISC
00041AI  DEA0 9496 =0018B4I          OC    RA,CLEAR        YES -CLEAR
00041EI  4830 9DD4 =0021F6I FFBF1    LH    R3,FFBFFL       GET THE FLAG
000422I  4230 803E =000464I          BNZ   BFIT
         0000 0426I         FFIT3    EQU   *
000426I  DEA0 947C =0018A6I          OC    RA,FWFM         FORWARD FM
00042AI  4100 9552 =001980I          BAL   R0,NOMOTN       WAIT
00042EI  E650 9AFE =001F30I          LDAI  R5,FFBUF        SET UP TO READ
000432I  E660 9B2C =001F62I          LDAI  R6,FFBUF+50
000436I  E610 804E =000488I          LDAI  R1,FFEOV
00043AI  4130 9108 =001546I          BAL   R3,READPB       READ THE PDB
00043EI  4830 9D7E =0021C0I          LH    R3,PGMNUM       GET THE NUMBER ENTERED
000442I  4530 9AEA =001F30I          CLH   R3,FFBUF
000446I  4230 FFD4 =00041EI          BNE   FFBF1           NO
00044AI  D330 9D74 =0021C2I          LB    R3,PGMNUM+2     YES - GET THE THIRD DIGIT
00044EI  D340 9AE0 =001F32I          LB    R4,FFBUF+2
000452I  0534                        CLAR  R3,R4
000454I  4230 FFC6 =00041EI          BNE   FFBF1           NO
000458I  DEA0 9451 =0018ADI          OC    RA,BKSP         YES - REPOSITION THE TAPE AT
00045CI  4100 9520 =001980I          BAL   R0,NOMOTN
000460I  4300 809E =000502I          B     FFDSC5
         0000 0464I         BFIT     EQU   *
000464I  4100 9526 =00198EI          BAL   R0,BKFMNM       WAIT FOR NO MOTION OF BOT
000468I  4800 9D8E =0021FAI BFIT1    LH    R0,BKSPFL       BACKSPACE FLAG SET ?
00046CI  2335                        BZS   BFIT4           NO - DO 1 BACKSPACE
00046EI  DEA0 9435 =0018A7I          OC    RA,BKFM         YES - DO 2 BACKSPACES
000472I  4100 9518 =00198EI          BAL   R0,BKFMNM       WAIT FOR NO MOTION OF BOT
000476I  240F               BFIT4    LIS   R0,15
000478I  4000 907E =0021FAI          STH   R0,BKSPFL       SET THE DOUBLE BACKSPACE FLAG
00047CI  DEA0 9427 =0018A7I          OC    RA,BKFM
000480I  4100 950A =00198EI          BAL   R0,BKFMNM       WAIT FOR NO MOTION OF BOT
000484I  4300 FF9E =000426I          B     FFIT3
         0000 0488I         FFEOV    EQU   *
000488I  4100 94F4 =001980I          BAL   R0,NOMOTN
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00048CI  DEA0 9417 =0018A7I   538           OC    RA,BKFM            BACKSPACE FILE MARK           MDG05380
000490I  4100 94EC =001980I   539           BAL   R0,NOMOTN          WAIT FOR NO MOTION            MDG05390
000494I  4830 9D5E =0021F6I   540           LH    R3,FFBFFL          GET THE FF BF FLAG            MDG05400
000498I  4230 FF82 =00041EI   541           BNZ   FFBF1                                            MDG05410
00049CI  41E0 941C =0018BCI   542  PEOV     BAL   RE,CRLF            DO CR/LF                      MDG05420
0004A0I  E620 8008 =0004ACI   543           LDAI  R2,EOVX            PRINT EOV                     MDG05430
0004A4I  4130 941E =0018C6I   544           BAL   R3,PRINT                                         MDG05440
0004A8I  4300 9214 =0016C0I   545           B     PEOJ               PRINT EOJ                     MDG05450
0004ACI  454F 5620            546  EOVX     DC    C'EOV',X'0D0A'                                   MDG05460
0004B0I  0D0A
         0000 04B2I           547  FFDISC   EQU   *                                                MDG05470
0004B2I  D380 FB94 =00004AI   548           LB    R8,SOD             GET START                     MDG05480
0004B6I  4080 9D46 =002200I   549           STH   R8,CYL             SET CYLINDER TO START         MDG05490
0004BAI  0788                 550           XAR   R8,R8              SET SECTOR TO ZERO            MDG05500
0004BCI  4130 951E =0019DEI   551           BAL   R3,WDFT                                          MDG05510
0004C0I  DEA0 93EB =0018AFI   552           OC    RA,SEEK            SEEK                          MDG05520
0004C4I  4130 9548 =001A10I   553           BAL   R3,FRSRW           WAIT                          MDG05530
0004C8I  2430                 554           LIS   R3,0                                             MDG05540
0004CAI  4030 9D34 =002202I   555  FFDS1B   STH   R3,HEAD            SET HEAD TO ZERO              MDG05550
0004CEI  E650 98DA =0020ACI   556  FFDS1A   LDAI  R5,DIRECT          SET UP THE SELCH              MDG05560
0004D2I  0865                 557           LDAR  R6,R5              ADDRESS                       MDG05570
*0004D4I CA60 00FF            558           AAI   R6,X'FF'                                         MDG05580
0004D8I  4130 9502 =0019DEI   559           BAL   R3,WDFT                                          MDG05590
0004DCI  4130 903A =00151AI   560           BAL   R3,RDISC           READ                          MDG05600
0004E0I  0722                 561           XAR   R2,R2              ZERO BLOCK POINTER            MDG05610
0004E2I  4830 9CDA =0021C0I   562  FFDS1    LH    R3,PGMNUM                                        MDG05620
0004E6I  4842 9BC2 =0020ACI   563           LH    R4,DIRECT(R2)      EOV ?                         MDG05630
0004EAI  4330 806A =000558I   564           BZ    TSTBOV             YES - # NOT FOUND             MDG05640
0004EEI  0534                 565           CLAR  R3,R4              EQUAL ?                       MDG05650
0004F0I  4230 8034 =000528I   566           BNE   FFDSC1             NO                            MDG05660
0004F4I  D330 9CCA =0021C2I   567           LB    R3,PGMNUM+2        YES - GET THE NEXT DIGIT      MDG05670
0004F8I  D342 9BB2 =0020AEI   568           LB    R4,DIRECT+2(R2)                                  MDG05680
0004FCI  0534                 569           CLAR  R3,R4              EQUAL ?                       MDG05690
0004FEI  4230 8026 =000528I   570           BNE   FFDSC1             NO                            MDG05700
000502I  4830 9CBA =0021C0I   571  FFDSC5   LH    R3,PGMNUM                                        MDG05710
000506I  D340 9CB8 =0021C2I   572           LB    R4,PGMNUM+2        AND STORE IT IN THE LOCK      MDG05720
00050AI  4810 9CF0 =0021FEI   573           LH    R1,IOFLAG          GET THE FLAG - OUTPUT         MDG05730
00050EI  2337                 574           BZS   FFBFED             YES                           MDG05740
000510I  4030 9908 =001EECI   575           STH   R3,PGMIPN          NO - RESET THE INPUT DEV. FLG MDG05750
000514I  D240 9906 =001EEEI   576           STB   R4,PGMIPN+2                                      MDG05760
000518I  4300 91A4 =0016C0I   577           B     PEOJ                                             MDG05770
00051CI  4030 99C8 =001EE8I   578  FFBFED   STH   R3,PGMOPN                                        MDG05780
000520I  D240 99C6 =001EEAI   579           STB   R4,PGMOPN+2                                      MDG05790
000524I  4300 9198 =0016C0I   580           B     PEOJ                                             MDG05800
         0000 0528I           581  FFDSC1   EQU   *                                                MDG05810
000528I  2628                 582           AIS   R2,8               BUMP POINTER                  MDG05820
00052AI  C520 0100            583           CLHI  R2,X'100'          THIS BLOCK FINISHED ?         MDG05830
00052EI  4230 FFB0 =0004E2I   584           BNE   FFDS1              NO                            MDG05840
000532I  2681                 585           AIS   R8,1               YES - INCREMENT THE SECTOR    MDG05850
000534I  484F 9C8C =0021C4I   586           LH    R4,TRKDEN(RF)      LOAD TRKDEN                   MDG05860
000538I  4584 8028 =000564I   587           CLH   R8,SECTAB(R4)      MAXIMUM?                      MDG05870
00053CI  4230 FF8E =0004CEI   588           BNE   FFDS1A             NO                            MDG05880
000540I  4880 9CBE =002202I   589           LH    R8,HEAD            YES - INCREMENT THE HEAD      MDG05890
000544I  484F 9C7C =0021C4I   590           LH    R4,TRKDEN(RF)      LOAD TRKDEN                   MDG05900
000548I  4584 8026 =000572I   591           CLH   R8,HDTAB(R4)       MAXIMUM?                      MDG05910
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00054CI  4330 9734 =001C84I    592            BE     DIRFUL           YES-ERROR                                MDG05920
000550I  2631                  593            AIS    R3,1             INCRIMENT HEAD                           MDG05930
000552I  0788                  594            XAR    R8,R8            ZERO SECTOR                              MDG05940
000554I  4300 FF72 =0004CAI    595            B      FFDS1B                                                    MDG05950
000558I  4840 9C9A =0021F6I    596  TSTBOV    LH     R4,FFBFFL        EOV ON BF ?                              MDG05960
00055CI  4330 FF3C =00049CI    597            BZ     PEOV             NO - PRINT "EOV"                         MDG05970
000560I  4300 943E =0019A2I    598            B      PBOV             YES - PRINT "BOV"                        MDG05980
000564I  0000                  599  SECTAB    DC     H'0'                                                      MDG05990
000566I  0000                  600            DC     H'0'                                                      MDG06000
000568I  0000                  601            DC     H'0'                                                      MDG06010
00056AI  0040                  602            DC     H'64'            *                              R04        MDG06020
00056CI  0018                  603            DC     H'24'                                                     MDG06030
00056EI  0040                  604            DC     H'64'                                                     MDG06040
000570I  0040                  605            DC     H'64'                                                     MDG06050
000572I  0000                  606  HDTAB     DC     H'0'                                                      MDG06060
000574I  0000                  607            DC     H'0'                                                      MDG06070
000576I  0000                  608            DC     H'0'                                                      MDG06080
000578I  0000                  609            DC     H'0'             *                              R04        MDG06090
00057AI  0001                  610            DC     H'1'                                                      MDG06100
00057CI  0004                  611            DC     H'4'                                                      MDG06110
00057EI  0012                  612            DC     H'18'                                                     MDG06120
                               613  *************************************************************************** MDG06130
                               614  *                                                                       * MDG06140
                               615  *  E O V                                                                * MDG06150
                               616  *                                                                       * MDG06160
                               617  *     THIS ROUTINE WILL WRITE "EOV" ON THE MEDIA.  IT CAN ONLY BE       * MDG06170
                               618  *     EXECUTED WHEN THE POSITION OF THE MEDIA IS KNOWN.  THE COMMAND    * MDG06180
                               619  *     IS ALWAYS DIRECTED AT OUTDEV                                      * MDG06190
                               620  *                                                                       * MDG06200
                               621  *************************************************************************** MDG06210
          0000 0580I           622  EV        EQU    *                CAN ONLY BE USED ON OUTPUT DEVICE        MDG06220
000580I  2441                  623            LIS    R4,1             SET THE EOJ                              MDG06230
000582I  4040 9C84 =00220AI    624            STH    R4,EOJFLG        FLAG                                     MDG06240
000586I  4130 91F8 =001782I    625            BAL    R3,LODAD         LOAD OUTPUT ADDRESSES                    MDG06250
00058AI  2531                  626            LCS    R3,1                                                      MDG06260
00058CI  4530 9958 =001EE8I    627            CLH    R3,PGMOPN        IS OUTPUT DEVICE LOCKED ?                MDG06270
000590I  2135                  628            BNES   EV1                                                       MDG06280
000592I  C810 00D1             629            LHI    R1,X'D1'         YES ERROR                                MDG06290
000596I  4300 973A =001CD4I    630            B      ERRA                                                      MDG06300
00059AI  4130 91E4 =001782I    631  EV1       BAL    R3,LODAD         GET R1                                   MDG06310
00059EI  C510 0003             632            CLHI   R1,X'03'         < 3 ?                                    MDG06320
0005A2I  2187                  633            BLS    EVMT             YES - MAG TAPE                           MDG06330
0005A4I  4130 8DDC =001384I    634            BAL    R3,UPDTXX        ZERO OUT THE PROPER PART OF THE          MDG06340
0005A8I  4130 9418 =0019C4I    635            BAL    R3,LOKOUT                                                 MDG06350
0005ACI  4300 9110 =0016C0I    636            B      PEOJ             DIRECTORY                                MDG06360
          0000 05B0I           637  EVMT      EQU    *                                                         MDG06370
0005B0I  4100 93CC =001980I    638            BAL    R0,NOMOTN                                                 MDG06380
0005B4I  DEA0 92EF =0018A7I    639            OC     RA,BKFM                                                   MDG06390
0005B8I  4100 93C4 =001980I    640            BAL    R0,NOMOTN                                                 MDG06400
0005BCI  4130 9404 =0019C4I    641            BAL    R3,LOKOUT                                                 MDG06410
0005C0I  4300 90E4 =0016A8I    642            B      EOV                                                       MDG06420
                               643  *************************************************************************** MDG06430
                               644  *                                                                       * MDG06440
                               645  *  R E W I N D                                                          * MDG06450
                               646  *                                                                       * MDG06460
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                             *                                                                  *   MDG06470
                             *            THIS ROUTINE WILL REWIND THE SPECIFIED MEDIA          *   MDG06480
                             *                                                                  *   MDG06490
                             *        INPUT: R1 = THE CURRENT INDEX INTO THE INPUT BUFFER,      *   MDG06500
                             *                    IT POINTS TO THE DEVICE IDENTIFER CHARACTER.(I-O)*   MDG06510
                             *                                                                  *   MDG06520
                             *       OUTPUT: A MAG TAPE IS REWOUND TO LOAD POINT AND THE LOCK WORD *   MDG06530
                             *               IS SET. ON A DISC THE LOCK WORD IS SET.            *   MDG06540
                             *                                                                  *   MDG06550
                             ********************************************************************   MDG06560
          0000 05C4I         RW       EQU   *                                                       MDG06570
0005C4I   2441                        LIS   R4,1                  SET THE EOJ                       MDG06580
0005C6I   4040 9C40 =00220AI          STH   R4,EOJFLG             FLAG                              MDG06590
0005CAI   4130 9398 =001966I          BAL   R3,GETCHR             GET A CHARACTER                   MDG06600
0005CEI   24FF                        LIS   RF,15                 SET THE I INDICATOR               MDG06610
0005D0I   C500 0049                   CLHI  R0,C'I'               I ?                               MDG06620
0005D4I   2134                        BNES  RWX                                                     MDG06630
0005D6I   4130 9220 =0017FAI          BAL   R3,LIDAD                                                MDG06640
0005DAI   2308                        BS    RWO                                                     MDG06650
          0000 05DCI         RWX      EQU   *                                                       MDG06660
0005DCI   24F0                        LIS   RF,0                  SET THE O INDICATOR               MDG06670
0005DEI   C500 004F                   CLHI  R0,C'O'               NO - O ?                          MDG06680
0005E2I   4230 938E =001974I          BNE   QUEST                 NO - ERROR                        MDG06690
0005E6I   4130 9198 =001782I          BAL   R3,LODAD                                                MDG06700
0005EAI   C510 0003          RWO      CLHI  R1,X'03'              < 3 ?                             MDG06710
*0005EEI  238F                        BNL   RWDISC                NO - REWIND THE DISC              MDG06720
0005F0I   DEA0 92B6 =0018AAI          OC    RA,DISABL             YES - REWIND THE TAPE             MDG06730
0005F4I   08BB                        LDAR  RB,RB                                                   MDG06740
0005F6I   2333                        BZS   RWO1                                                    MDG06750
0005F8I   DEB0 92B0 =0018ACI          OC    RB,STOP                                                 MDG06760
0005FCI   DEA0 92B4 =0018B4I RWO1     OC    RA,CLEAR                                                MDG06770
000600I   4100 937C =001980I          BAL   R0,NOMOTN                                               MDG06780
000604I   DEA0 92AD =0018B5I          OC    RA,REWIND                                               MDG06790
000608I   4100 9374 =001980I          BAL   R0,NOMOTN                                               MDG06800
          0000 060CI         RWDISC   EQU   *                                                       MDG06810
00060CI   08FF                        LDAR  RF,RF                 SET THE CONDITION CODE            MDG06820
00060EI   2335                        BZS   RWOPDS                OUTPUT DEVICE WAS SPECIFIED       MDG06830
000610I   4130 93A4 =0019B8I          BAL   R3,LOKIN              LOCKOUT THE INPUT DEVICE          MDG06840
000614I   4300 90A8 =0016C0I          B     PEOJ                                                    MDG06850
000618I   4130 93A8 =0019C4I RWOPDS   BAL   R3,LOKOUT             LOCKOUT THE OUTPUT DEVICE         MDG06860
00061CI   4300 90A0 =0016C0I          B     PEOJ                                                    MDG06870
                             ********************************************************************   MDG06880
                             *                                                                  *   MDG06890
                             *  S E Q N A M                                                     *   MDG06900
                             *                                                                  *   MDG06910
                             *                                                                  *   MDG06920
                             *             THIS ROUTINE WILL SET THE SEQUENCE NUMBER, AND       *   MDG06930
                             *             NAME UP IN MEMORY. THIS NUMBER AND NAME WILL BE      *   MDG06940
                             *             COPIED TO THE MEDIA ON A CREATE OPERATION.           *   MDG06950
                             *                                                                  *   MDG06960
                             *        INPUT: R1 = THE CURRENT INDEX INTO THE INPUT BUFFER,      *   MDG06970
                             *                    IT POINTS TO THE FIRST CHARACTER OF THE       *   MDG06980
                             *                    SEQUENCE NUMBER.                              *   MDG06990
                             *                                                                  *   MDG07000
                             *       OUTPUT:  THE SEQUENCE NUMBER AND NAME ARE STORED IN        *   MDG07010
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                                 *                   ASCII IN THE SEQNAM BUFFER                              *   MDG07020
                                 *                                                                           *   MDG07030
                                 ***************************************************************************   MDG07040
000620I  0722                    SEQ      XAR   R2,R2               ZERO OUT                                     MDG07050
000622I  C800 2020               SEQZ     LHI   R0,X'2020'          THE                                          MDG07060
000626I  4002 993E =001F68I               STH   R0,SEQNAM(R2)       SEQUENCE - NAME                              MDG07070
00062AI  2622                             AIS   R2,2                FIELD                                        MDG07080
00062CI  C520 0032                        CLHI  R2,50                                                            MDG07090
000630I  2037                             BNES  SEQZ                                                             MDG07100
000632I  2450                             LIS   R5,0                                                             MDG07110
000634I  4130 932E =001966I      SEQ1     BAL   R3,GETCHR                                                        MDG07120
000638I  C500 0020                        CLHI  R0,X'20'                                                         MDG07130
00063CI  4330 80BC =0006FCI               BE    ZSQEST                                                           MDG07140
000640I  C500 000D                        CLHI  R0,X'0D'            IS IT CR                                     MDG07150
000644I  4330 80B4 =0006FCI               BE    ZSQEST                                                           MDG07160
000648I  C500 002C                        CLHI  R0,C','                                                          MDG07170
00064CI  233D                             BES   SEQ2                                                             MDG07180
00064EI  C550 0003                        CLHI  R5,3                                                             MDG07190
000652I  4330 80A6 =0006FCI               BE    ZSQEST                                                           MDG07200
000656I  0870                             LDAR  R7,R0                                                            MDG07210
000658I  4130 9630 =001C8CI               BAL   R3,ISHXCO                                                        MDG07220
00065CI  D275 9908 =001F68I               STB   R7,SEQNAM(R5)                                                    MDG07230
000660I  2651                             AIS   R5,1                                                             MDG07240
000662I  4300 FFCE =000634I               B     SEQ1                                                             MDG07250
000666I  C550 0003               SEQ2     CLHI  R5,3                                                             MDG07260
00066AI  4230 808E =0006FCI               BNE   ZSQEST                                                           MDG07270
00066EI  4130 92F4 =001966I      SEQ9     BAL   R3,GETCHR                                                        MDG07280
000672I  C500 0020                        CLHI  R0,C' '                                                          MDG07290
000676I  4330 8082 =0006FCI               BE    ZSQEST                                                           MDG07300
00067AI  C500 000D                        CLHI  R0,X'0D'            IS IT CR                                     MDG07310
00067EI  4330 807A =0006FCI               BE    ZSQEST                                                           MDG07320
000682I  C500 002C                        CLHI  R0,C','                                                          MDG07330
000686I  4330 8044 =0006CEI               BE    SEQ99                                                            MDG07340
00068AI  C500 002E                        CLHI  R0,C'.'             EXTENSION DELIMITER?                         MDG07350
00068EI  4230 8024 =0006B6I               BNE   SEQ91               NO                                           MDG07360
000692I  C550 0008                        CLHI  R5,8                                                             MDG07370
000696I  4230 8062 =0006FCI               BNE   ZSQEST                                                           MDG07380
00069AI  4130 92C8 =001966I               BAL   R3,GETCHR           GET NEXT                                     MDG07390
00069EI  C870 002E                        LHI   R7,C'.'             LOAD DECIMAL POINT                           MDG07400
0006A2I  D270 98DB =001F81I               STB   R7,SEQNAM+25        STORE                                        MDG07410
0006A6I  0870                             LDAR  R7,R0               SAVE R0                                      MDG07420
0006A8I  4130 95E0 =001C8CI               BAL   R3,ISHXCO                                                        MDG07430
0006ACI  D270 98D2 =001F82I               STB   R7,SEQNAM+26        STORE                                        MDG07440
0006B0I  4130 92B2 =001966I               BAL   R3,GETCHR                                                        MDG07450
*0006B4I 230D                             B     SEQ99                                                            MDG07460
0006B6I  C550 0008               SEQ91    CLHI  R5,8                                                             MDG07470
0006BAI  4330 803E =0006FCI               BE    ZSQEST                                                           MDG07480
0006BEI  0870                             LDAR  R7,R0                                                            MDG07490
0006C0I  4130 95C8 =001C8CI               BAL   R3,ISHXCO                                                        MDG07500
0006C4I  D275 98A0 =001F68I               STB   R7,SEQNAM(R5)                                                    MDG07510
0006C8I  2651                             AIS   R5,1                                                             MDG07520
0006CAI  4300 FFA0 =00066EI               B     SEQ9                                                             MDG07530
0006CEI  C550 0008               SEQ99    CLHI  R5,8                                                             MDG07540
0006D2I  4230 8026 =0006FCI               BNE   ZSQEST                                                           MDG07550
0006D6I  4130 928C =001966I      SEQ2A    BAL   R3,GETCHR                                                        MDG07560
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0006DAI  C500 000D                   CLHI  R0,X'0D'                                                   MDG07570
0006DEI  4330 F9BA =00009CI          BE    REDTTY                                                     MDG07580
0006E2I  C550 0012                   CLHI  R5,18                                                      MDG07590
0006E6I  2338                        BES   SETGAP                                                     MDG07600
0006E8I  C550 0032                   CLHI  R5,50                                                      MDG07610
0006ECI  2338                        BES   ZSQEST                                                     MDG07620
0006EEI  D205 9876 =001F68I   SET1   STB   R0,SEQNAM(R5)                                              MDG07630
0006F2I  2651                        AIS   R5,1                                                       MDG07640
0006F4I  220F                        BS    SEQ2A                                                      MDG07650
0006F6I  C850 001E            SETGAP LHI   R5,30               THIS LEAVES A GAP IN THE TABLE         MDG07660
0006FAI  2206                        BS    SET1                                                       MDG07670
0006FCI  C800 2020            ZSQEST LHI   R0,X'2020'                                                 MDG07680
000700I  0722                        XAR   R2,R2                                                      MDG07690
000702I  4002 9862 =001F68I   ZSQZ   STH   R0,SEQNAM(R2)                                              MDG07700
000706I  2622                        AIS   R2,2                                                       MDG07710
000708I  C520 0032                   CLHI  R2,50                                                      MDG07720
00070CI  2035                        BNES  ZSQZ                                                       MDG07730
00070EI  4300 9262 =001974I          B     QUEST                                                      MDG07740
                              *********************************************************************** MDG07750
                              *                                                                     * MDG07760
                              *  C O P Y                                                            * MDG07770
                              *                                                                     * MDG07780
                              *   THIS ROUTINE IS USED TO COPY ONE MEDIA TO ANOTHER.  THE ENTRY     * MDG07790
                              *   TO THIS PROGRAM INTERRIGATES "INDEV" AND "OUTDEV" TO DETERMINE    * MDG07800
                              *   WHICH OF THE FOUR (4) INTERNAL ROUTINES WILL BE USED. THE         * MDG07810
                              *   INTERNAL ROUTINES ARE:                                            * MDG07820
                              *                                                                     * MDG07830
                              *       DIDO - DISC INPUT / DISC OUTPUT                               * MDG07840
                              *       DIMO - DISC INPUT / MAG TAPE OUTPUT                           * MDG07850
                              *       MIMO - MAG TAPE INPUT / MAG TAPE OUTPUT                       * MDG07860
                              *       MIDO - MAG TAPE INPUT / DISC OUTPUT                           * MDG07870
                              *                                                                     * MDG07880
                              *                                                                     * MDG07890
                              *   CONTROL COME TO THE TEST FROM THE OPTION INPUT ROUTINE            * MDG07900
                              *                                                                     * MDG07910
                              *       INPUT - R1 = AN INDEX INTO THE INPUT BUFFER. IT POINTS        * MDG07920
                              *                    TO THE FIRST CHARACTER TO BE USED AS THE         * MDG07930
                              *                    THREE (3) DIGIT SEQUENCE NUMBER.                 * MDG07940
                              *                                                                     * MDG07950
                              *    THE ROUTINE FIRST CHECKS TO SEE IF THE CONDITION AND POSITION    * MDG07960
                              *    OF BOTH OUTPUT AND INPUT DEVICES IS KNOWN. THIS IS DONE FROM     * MDG07970
                              *    THE HISTORY OF THE DEVICE MAINTAINED IN MEMORY. IF AN UNKNOWN    * MDG07980
                              *    CONDITION IS FOUND AN ERROR IS PRINTED. IF NO ERROR IS FOUND     * MDG07990
                              *    THE TRANSFER BEGINS. IF THE OUTPUT DEVICE IS NOT AT EOV THE      * MDG08000
                              *    COPY WILL START AT THE CURRENT POSITION OF THE MEDIA. THE COPY   * MDG08010
                              *    CONTINUES UNTIL THE NUMBER SPECIFIED IS FOUND OR UNTIL EOV IS    * MDG08020
                              *    DETECTED.                                                        * MDG08030
                              *                                                                     * MDG08040
                              *    WHEN THE JOB IS COMPLETE "EOJ" IS PRINTED ON THE CONSOLE.        * MDG08050
                              *                                                                     * MDG08060
                              *********************************************************************** MDG08070
                              *                                                                       MDG08080
         0000 0712I           COPY   EQU   *                                                          MDG08090
000712I  2450                        LIS   R5,0                SET CHARACTER COUNT TO ZERO            MDG08100
000714I  4130 924E =001966I   CPYMOR BAL   R3,GETCHR           GET A CHARACTER                        MDG08110
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000718I  C500 000D                        CLHI  R0,X'0D'        CR                               MDG08120
00071CI  4330 8020 =000740I               BE    COPYA           YES                              MDG08130
000720I  C550 0003                        CLHI  R5,3            TO MANY CHAR ?                   MDG08140
000724I  4220 924C =001974I               BP    QUEST           YES                              MDG08150
000728I  0870                             LDAR  R7,R0           NO                               MDG08160
00072AI  C570 004F                        CLHI  R7,C'O'         IS IT O ?                        MDG08170
00072EI  4330 802E =000760I               BE    COPYEV          YES                              MDG08180
000732I  4130 9556 =001C8CI               BAL   R3,ISHXCO       VALID HEX CHARACTER ?            MDG08190
000736I  D275 9A86 =0021C0I               STB   R7,PGMNUM(R5)   YES                              MDG08200
00073AI  2651                             AIS   R5,1                                             MDG08210
00073CI  4300 FFD4 =000714I               B     CPYMOR                                           MDG08220
000740I  C550 0003                COPYA   CLHI  R5,3            ENOUGH CHAR?                     MDG08230
000744I  4230 922C =001974I               BNE   QUEST           NO                               MDG08240
000748I  C810 1EECI                       LHI   R1,PGMIPN       GET THE INDEV LOCK               MDG08250
00074CI  C510 FFFF                        CLHI  R1,X'FFFF'      = -1 ?                           MDG08260
000750I  4230 803E =000792I               BNE   COPY1           THE INDEV POSITION KNOWN         MDG08270
000754I  4130 90A2 =0017FAI               BAL   R3,LIDAD        YES - THEN INDEV NOT POSITIONED  MDG08280
000758I  C810 00EB                        LHI   R1,X'EB'                                         MDG08290
00075CI  4300 9574 =001C04I               B     ERRA            PRINT ERROR                      MDG08300
000760I  C550 0001                COPYEV  CLHI  R5,1                                             MDG08310
000764I  4230 920C =001974I               BNE   QUEST                                            MDG08320
000768I  D330 9A54 =0021C0I               LB    R3,PGMNUM                                        MDG08330
00076CI  C530 0045                        CLHI  R3,C'E'                                          MDG08340
000770I  4230 9200 =001974I               BNE   QUEST                                            MDG08350
000774I  4130 91EE =001966I               BAL   R3,GETCHR                                        MDG08360
000778I  C500 0056                        CLHI  R0,C'V'         IS IT V ?                        MDG08370
00077CI  4230 91F4 =001974I               BNE   QUEST           NO                               MDG08380
000780I  C800 3030                        LHI   R0,X'3030'                                       MDG08390
000784I  4000 9A38 =0021C0I               STH   R0,PGMNUM                                        MDG08400
000788I  D200 9A36 =0021C2I               STB   R0,PGMNUM+2                                      MDG08410
00078CI  2453                             LIS   R5,3                                             MDG08420
00078EI  4300 FF82 =000714I               B     CPYMOR                                           MDG08430
         0000 0792I               COPY1   EQU   *                                                MDG08440
000792I  4130 8FEC =001782I               BAL   R3,LODAD        GET THE OUTDEV ADDRESS           MDG08450
000796I  45A0 9748 =001EE2I               CLH   RA,INDEV+2      IS OUTDEV = INDEV ?              MDG08460
00079AI  2135                             BNES  COPY2           NO - CONTINUE                    MDG08470
00079CI  C800 4435                        LHI   R0,C'D5'        YES - ERROR                      MDG08480
0007A0I  4300 946C =001C10I               B     ERROR                                            MDG08490
         0000 07A4I               COPY2   EQU   *                                                MDG08500
0007A4I  4130 9052 =0017FAI               BAL   R3,LIDAD        GET THE INPUT DEVICE TYPE        MDG08510
0007A8I  C510 0003                        CLHI  R1,X'03'        MAG TAPE ?                       MDG08520
0007ACI  2189                             BLS   MTIN            YES                              MDG08530
0007AEI  4130 8FD0 =001782I               BAL   R3,LODAD        GET THE OUTPUT DEVICE TYPE       MDG08540
0007B2I  C510 0003                        CLHI  R1,X'03'        MAG TAPE ?                       MDG08550
0007B6I  4280 82B2 =000A6CI               BL    DIMO            THEN DISC INPUT - MAG TAPE OUTPUT MDG08560
0007BAI  4300 848C =000C4AI               B     DIDO            NO THEN DISC TO DISC             MDG08570
         0000 07BEI               MTIN    EQU   *               MAG TAPE INPUT                   MDG08580
0007BEI  4130 8FC0 =001782I               BAL   R3,LODAD                                         MDG08590
0007C2I  C510 0003                        CLHI  R1,X'03'        GET THE OUTPUT DEVICE TYPE       MDG08600
0007C6I  2183                             BLS   MIMO            MAG TAPE TO MAG TAPE             MDG08610
0007C8I  4300 8138 =000904I               B     MIDO            MAG TAPE TO DISC                 MDG08620
         0000 07CCI               MIMO    EQU   *                                                MDG08630
0007CCI  2441                             LIS   R4,1                                             MDG08640
0007CEI  4040 9A38 =00220AI               STH   R4,EOJFLG                                        MDG08650
                                  *                                                              MDG08660
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                            867  *  MAG TAPE IN - MAG TAPE OUT                                                   MDG08670
                            868  *                                                                              MDG08680
0007D2I  4130 9024 =0017FAI 869            BAL   R3,LIDAD      LOAD THE INPUT DEVICE ADDRESSES                   MDG08690
0007D6I  E650 978E =001F68I 870            LDAI  R5,PDB        SET UP THE STORAGE AREA                           MDG08700
0007DAI  E660 97BD =001F9BI 871            LDAI  R6,PDB+51     *                                          R04    MDG08710
0007DEI  E610 8098 =00087AI 872            LDAI  R1,MIMOFM     SET FILE MARK RETURN                              MDG08720
0007E2I  4130 8D60 =001546I 873            BAL   R3,READPB     GO READ                                           MDG08730
0007E6I  4130 81CC =0009B6I 874            BAL   R3,MISTRT                                                       MDG08740
0007EAI  4130 8F94 =001782I 875            BAL   R3,LODAD      LOAD THE OUTPUT DEVICE ADDRESSES                  MDG08750
0007EEI  9DA1               876            SSR   RA,R1         BOT ?                                             MDG08760
0007F0I  C310 0020          877            THI   R1,X'20'                                                        MDG08770
0007F4I  2335               878            BZS   WTMIMO        NO                                                MDG08780
0007F6I  C810 00E0          879            LHI   R1,X'E0'      YES                                               MDG08790
0007FAI  4300 94D6 =001CD4I 880            B     ERRA          ERROR                                             MDG08800
0007FEI  E650 9766 =001F68I 881  WTMIMO    LDAI  R5,PDB        SET UP THE ADDRESS                                MDG08810
000802I  E660 9795 =001F9BI 882            LDAI  R6,PDB+51     *                                         R04     MDG08820
000806I  4130 8D32 =00153CI 883            BAL   R3,WRTPB      GO WRITE THE PDB                                  MDG08830
00080AI  4130 8FEC =0017FAI 884  MIMONX    BAL   R3,LIDAD      LOAD THE INPUT DEVICE ADDRESSES                   MDG08840
00080EI  E650 978A =001F9CI 885            LDAI  R5,WRTBUF     SET UP THE                                        MDG08850
000812I  0865               886            LDAR  R6,R5         BUFFER TO READ                                    MDG08860
000814I  4830 9A00 =002218I 887            LH    R3,NUMBLK     GET THE NUMBER OF BLOCKS                          MDG08870
000818I  4330 801E =00083AI 888            BZ    MIMOLB                                                          MDG08880
*00081CI CA60 00FF          889            AAI   R6,X'FF'                                                        MDG08890
000820I  2731               890            SIS   R3,1          DECREMENT THE COUNT                               MDG08900
000822I  4030 99F2 =002218I 891            STH   R3,NUMBLK                                                       MDG08910
000826I  C830 00FF          892            LHI   R3,X'FF'      SET THE CURRENT BLOCK                             MDG08920
00082AI  4030 99EC =00221AI 893  MIMO2X    STH   R3,CURBLK     SIZE                                              MDG08930
00082EI  E610 8150 =000982I 894            LDAI  R1,MIDOFR     SET FILE MARK RETURN                              MDG08940
000832I  4130 8D10 =001546I 895            BAL   R3,READPB                                                       MDG08950
000836I  4300 8028 =000862I 896            B     MIMO1                                                           MDG08960
         0000 083AI         897  MIMOLB    EQU   *                                                               MDG08970
00083AI  4830 99D8 =002216I 898            LH    R3,LSTBLK     LAST BLOCK                                        MDG08980
00083EI  2336               899            BZS   MIMONL        NO LAST BLOCK                                     MDG08990
000840I  0A63               900            AAR   R6,R3                                                           MDG09000
000842I  0711               901            XAR   R1,R1                                                           MDG09010
000844I  4010 99CE =002216I 902            STH   R1,LSTBLK                                                       MDG09020
000848I  220F               903            BS    MIMO2X                                                          MDG09030
         0000 084AI         904  MIMONL    EQU   *             NO LAST BLOCK                                     MDG09040
00084AI  E650 974E =001F9CI 905            LDAI  R5,WRTBUF     THERE MUST BE A FILE MARK                         MDG09050
00084EI  0865               906            LDAR  R6,R5         OR ELSE ERROR                                     MDG09060
000850I  2664               907            AIS   R6,4                                                            MDG09070
000852I  E610 802C =000882I 908            LDAI  R1,MIMOFN     SET FM RETURN                                     MDG09080
000856I  4130 8CEC =001546I 909            BAL   R3,READPB                                                       MDG09090
00085AI  C810 00D0          910  MIMOER    LHI   R1,X'D0'      FM BEFORE END OF COUNT OR                         MDG09100
00085EI  4300 9472 =001CD4I 911            B     ERRA          END OF COUNT BEFORE FM                            MDG09110
                            912  *                                                                              MDG09120
         0000 0862I         913  MIMO1     EQU   *                                                               MDG09130
000862I  4130 8F1C =001782I 914            BAL   R3,LODAD      GET THE OUTPUT DEVICE ADDRESSES                   MDG09140
000866I  E650 9732 =001F9CI 915            LDAI  R5,WRTBUF     SET UP THE                                        MDG09150
00086AI  0865               916            LDAR  R6,R5         BUFFER VALUES                                     MDG09160
                            917  *                                                                              MDG09170
00086CI  4830 99AA =00221AI 918            LH    R3,CURBLK                                                       MDG09180
000870I  0A63               919            AAR   R6,R3                                                           MDG09190
000872I  4130 8CC6 =00153CI 920            BAL   R3,WRTPB                                                        MDG09200
000876I  4300 FF90 =00080AI 921            B     MIMONX                                                          MDG09210
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          0000 087AI          922  MIMOFM   EQU   *                                                   MDG09220
00087AI   C810 00EB           923           LHI   R1,X'EB'         READ A FILE MARK WHEN EXPECTING PDR  MDG09230
00087EI   4300 9452 =001CD4I  924           B     ERRA             ERROR                                MDG09240
          0000 0882I          925  MIMOEN   EQU   *                READ A FILE MARK DURING AN INPUT RE  MDG09250
000882I   4130 8EFC =001782I  926           BAL   R3,LODAD         WRITE A FILE MARK ON OUTDEV          MDG09260
000886I   DEA0 9021 =0018ABI  927           OC    RA,WFM           WRITE A FILE MARK                    MDG09270
00088AI   4100 90F2 =001980I  928           BAL   R0,NOMOTN                                             MDG09280
00088EI   DEA0 9019 =0018ABI  929           OC    RA,WFM           WRITE A SECOND FILE MARK             MDG09290
000892I   4100 90EA =001980I  930           BAL   R0,NOMOTN        WAIT                                 MDG09300
000896I   DEA0 9013 =0018ADI  931           OC    RA,BKSP          BACK SPACE OVER IT                   MDG09310
00089AI   4100 90E2 =001980I  932           BAL   R0,NOMOTN                                             MDG09320
          0000 089EI          933  COPMTI   EQU   *                                                     MDG09330
00089EI   4130 8F58 =0017FAI  934           BAL   R3,LIDAD         GET THE INDEV ADDRESSES              MDG09340
0008A2I   E650 96C2 =001F68I  935           LDAI  R5,PDB           SET UP THE STORAGE AREA              MDG09350
0008A6I   E660 96F1 =001F9BI  936           LDAI  R6,PDB+51        *                             R04    MDG09360
0008AAI   E610 803E =0008ECI  937           LDAI  R1,MIMOEV        SET EOV RETURN                       MDG09370
0008AEI   4130 8C94 =001546I  938           BAL   R3,READPB        GO READ                              MDG09380
0008B2I   DEA0 8FF7 =0018ADI  939           OC    RA,BKSP                                               MDG09390
0008B6I   4100 90C6 =001980I  940           BAL   R0,NOMOTN                                             MDG09400
0008BAI   4830 9902 =0021C0I  941           LH    R3,PGMNUM        GET THE COPY VALUE                   MDG09410
0008BEI   4530 96A6 =001F68I  942           CLH   R3,PDB           FIRST TWO DIGITS = ?                 MDG09420
0008C2I   4230 FECC =000792I  943           BNE   COPY1            NO - DO ANOTHER                      MDG09430
0008C6I   D330 98F8 =0021C2I  944           LB    R3,PGMNUM+2      YES                                  MDG09440
0008CAI   D340 969C =001F6AI  945           LB    R4,PDB+2         THIRD DIGIT = ?                      MDG09450
0008CEI   0534                946           CLAR  R3,R4                                                 MDG09460
0008D0I   4230 FEBE =000792I  947           BNE   COPY1            NO - DO ANOTHER                      MDG09470
0008D4I   4830 98E8 =0021C0I  948           LH    R3,PGMNUM        UPDATE                               MDG09480
0008D8I   4030 9610 =001EECI  949           STH   R3,PGMIPN        THE INDEV                            MDG09490
0008DCI   D330 98E2 =0021C2I  950           LB    R3,PGMNUM+2      LOCKOUT                              MDG09500
0008E0I   D230 960A =001EEEI  951           STB   R3,PGMIPN+2                                           MDG09510
0008E4I   4130 90E8 =0019D0I  952           BAL   R3,ZSEQ                                               MDG09520
0008E8I   4300 8DD4 =0016C0I  953           B     PEOJ             YES                                  MDG09530
          0000 08ECI          954  MIMOEV   EQU   *                                                     MDG09540
0008ECI   4100 9090 =001980I  955           BAL   R0,NOMOTN        WAIT                                 MDG09550
0008F0I   DEA0 8FB3 =0018A7I  956           OC    RA,BKFM                                               MDG09560
0008F4I   4100 9088 =001980I  957           BAL   R0,NOMOTN                                             MDG09570
0008F8I   4130 90BC =0019B8I  958           BAL   R3,LOKIN         LOCK THE INPUT DEVICE                MDG09580
0008FCI   4130 90D0 =0019D0I  959           BAL   R3,ZSEQ                                               MDG09590
000900I   4300 FB98 =00049CI  960           B     PEOV             PRINT EOV - EOJ                      MDG09600
          0000 0904I          961  MIDO     EQU   *                                                     MDG09610
000904I   2441                962           LIS   R4,1                                                  MDG09620
000906I   4040 9900 =00220AI  963           STH   R4,EOJFLG                                             MDG09630
00090AI   4130 8EEC =0017FAI  964           BAL   R3,LIDAD         LOAD THE INPUT DEVICE ADDRESSES      MDG09640
00090EI   E650 9656 =001F68I  965           LDAI  R5,PDB                                                MDG09650
000912I   E660 9685 =001F9BI  966           LDAI  R6,PDB+51        *                             R04    MDG09660
000916I   E610 FF60 =00087AI  967           LDAI  R1,MIDOFM        SET THE FILE MARK RETURN             MDG09670
00091AI   4130 8C28 =001546I  968           BAL   R3,READPB        GO READ                              MDG09680
00091EI   4130 8094 =0009B6I  969           BAL   R3,MISTRT                                             MDG09690
000922I   E630 8008 =00092EI  970           LDAI  R3,MIDO11        SET THE COPY FLAG                    MDG09700
000926I   5030 98AA =0021D4I  971           STA   R3,CPYFLG                                             MDG09710
00092AI   4300 870E =00103CI  972           B     CREDIS           GO TO THE CREATE ROUTINE TO WRITE    MDG09720
          0000 092EI          973  MIDO11   EQU   *                                                     MDG09730
00092EI   4080 98E2 =002214I  974           STH   R8,COPSEC        SAVE THE SECTOR NUMBER               MDG09740
000932I   4130 8EC4 =0017FAI  975           BAL   R3,LIDAD         LOAD THE INPUT DEVICE ADDRESSES      MDG09750
000936I   E650 9662 =001F9CI  976           LDAI  R5,WRTBUF                                             MDG09760
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00093AI  0865                             LDAR  R6,R5            SET UP THE BUFFER                      MDG09770
00093CI  4830 98D8 =002218I               LH    R3,NUMBLK        ADDRESSES                              MDG09780
000940I  4330 801E =000962I               BZ    MIDOLB                                                  MDG09790
*000944I CA60 00FF                        AAI   R6,X'FF'                                                MDG09800
000948I  2731                             SIS   R3,1             DECREMENT THE BLOCK COUNT              MDG09810
00094AI  4030 98CA =002218I               STH   R3,NUMBLK                                               MDG09820
00094EI  C830 00FF                        LHI   R3,X'FF'                                                MDG09830
000952I  4030 98C4 =00221AI       MIDO2X  STH   R3,CURBLK                                               MDG09840
000956I  E610 8028 =000982I               LDAI  R1,MIDOER        SET THE FM RETURN                      MDG09850
00095AI  4130 8BE8 =001546I               BAL   R3,READPB        GO READ                                MDG09860
00095EI  4300 8028 =00098AI               B     MIDO1                                                   MDG09870
         0000 0962I               MIDOLB  EQU   *                LAST BLOCK                             MDG09880
000962I  4830 98B0 =002216I               LH    R3,LSTBLK        GET THE SIZE                           MDG09890
000966I  2336                             BZS   MIDONL           = ZERO - NO BLOCK                      MDG09900
000968I  0A63                             AAR   R6,R3            SET THE LAST SIZE                      MDG09910
00096AI  0711                             XAR   R1,R1                                                   MDG09920
00096CI  4010 98A6 =002216I               STH   R1,LSTBLK                                               MDG09930
000970I  220F                             BS    MIDO2X                                                  MDG09940
         0000 0972I               MIDONL  EQU   *                                                       MDG09950
000972I  E650 9626 =001F9CI               LDAI  R5,WRTBUF        SET UP TO READ                         MDG09960
000976I  0865                             LDAR  R6,R5            BUT MUST GET FILE MARK AS THE COUNT    MDG09970
000978I  2664                             AIS   R6,4             IS EXHAUSTED                           MDG09980
00097AI  E610 8028 =0009A6I               LDAI  R1,MIDOEN        SET FM RETURN - ERROR IF NO FM         MDG09990
00097EI  4130 8BC4 =001546I               BAL   R3,READPB                                               MDG10000
000982I  C810 00D0                MIDOER  LHI   R1,X'D0'         FILE MARK BEFORE TRANSFER COMPLETE     MDG10010
000986I  4300 934A =001CD4I               B     ERRA             OR NO FM WHEN COUNT EXHAUSTED          MDG10020
                                  *                                                                     MDG10030
         0000 098AI               MIDO1   EQU   *                                                       MDG10040
00098AI  4130 8DF4 =001782I               BAL   R3,LODAO         LOAD THE OUTPUT DEVICE ADDRESSES       MDG10050
00098EI  E650 960A =001F9CI               LDAI  R5,WRTBUF        SET UP THE WRITE BUFFER                MDG10060
000992I  0865                             LDAR  R6,R5            VALUES                                 MDG10070
000994I  4830 9882 =00221AI               LH    R3,CURBLK                                               MDG10080
000998I  0A63                             AAR   R6,R3                                                   MDG10090
00099AI  4880 9876 =002214I               LH    R8,COPSEC        RETRIEVE THE SECTOR                    MDG10100
00099EI  4130 88D4 =001276I               BAL   R3,AVAILO        GO WRITE TO DISC                       MDG10110
0009A2I  4300 FF88 =00092EI               B     MIDO11           GO READ ANOTHER RECORD                 MDG10120
         0000 087AI               MIDOFM  EQU   MIMOFM           READ A FILE MARK WHEN EXPECTING PDB    MDG10130
         0000 09A6I               MIDOEN  EQU   *                                                       MDG10140
0009A6I  4130 8DD8 =001782I               BAL   R3,LODAO         LOAD THE OUTDEV ADDRESSES              MDG10150
0009AAI  4880 9866 =002214I               LH    R8,COPSEC        GET THE SECTOR NUMBER                  MDG10160
0009AEI  4130 87A6 =001158I               BAL   R3,DTRDON        WRITE EOV ON DISC                      MDG10170
0009B2I  4300 FEE8 =00089EI               B     COPMTI                                                  MDG10180
                                  ******************************************************************** MDG10190
                                  *                                                                  * MDG10200
                                  *  M I S T R T                                                     * MDG10210
                                  *                                                                  * MDG10220
                                  *                                                                  * MDG10230
                                  *   THIS ROUTINE WILL CALCULATE THE NUMBER OF FULL BLOCKS, AND THE * MDG10240
                                  *  LENGTH OF THE LAST BLOCK TO BE TRANSFERRED. IT IS CALCULATED FROM * MDG10250
                                  *  THE "LOW" AND "HIGH" ADDRESSES CONTAINED IN THE PDB.            * MDG10260
                                  *                                                                  * MDG10270
                                  *      INPUT:  R3 = RETURN ADDRESS                                 * MDG10280
                                  *                                                                  * MDG10290
                                  *      OUTPUT: THE LOCATION "NUMBLK" = THE NUMBER OF BLOCKS TO COPIED* MDG10300
                                  *              THE LOCATION "LSTBLK" = THE LENGTH OF THE LAST BLOCK. * MDG10310
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                          *                                                           *  MDG10320
                          *                                                           *  MDG10330
                          *****************************************************************  MDG10340
          0000 09B6I      MISTRT   EQU   *                                               MDG10350
0009B6I   5030 9812 =0021CCI       STA   R3,MISTRN         SAVE RETURN                   MDG10360
0009BAI   D350 95BE =001F7CI       LB    R5,PDB+20         GET THE LOW ORDER TWO DIGITS OF  MDG10370
0009BEI   D360 95BD =001F7FI       LB    R6,PDB+23         GET THE LOW ORDER TWO DIGITS OF  MDG10380
0009C2I   0556                     CLAR  R5,R6             COMPARE LOW AND HIGH          MDG10390
0009C4I   4280 803C =000A04I       BL    LOFRHI            IS LOW < HIGH ? - YES         MDG10400
0009C8I   4330 8038 =000A04I       BE    LOFRHI                                          MDG10410
0009CCI   0B56                     SAR   R5,R6                                           MDG10420
0009CEI   C830 0100                LHI   R3,X'100'         NO - THE SUB LOW FROM X'100'  MDG10430
0009D2I   0B35                     SAR   R3,R5             SUB LOW (R5) FROM HIGH (R3)   MDG10440
0009D4I   C530 0000                CLHI  R3,X'00'          DIFF. = 0 ?                   MDG10450
0009D8I   2132                     BNES  LOHIK1            NO                            MDG10460
0009DAI   2431                     LIS   R3,1              YES - THEN SET 1              MDG10470
0009DCI   4030 9836 =002216I LOHIK1 STH  R3,LSTBLK         SAVE BLOCK LENGTH             MDG10480
0009E0I   D350 9596 =001F7AI       LB    R5,PDB+18         GET THE HIGH ORDER THREE DIGITS OF  MDG10490
0009E4I   1158                     SLLS  R5,8              THE LOW ADDRESS               MDG10500
0009E6I   D330 9591 =001F7BI       LB    R3,PDB+19                                       MDG10510
0009EAI   0653                     OAR   R5,R3             R5 = HIGH ORDER LOW ADDRESS   MDG10520
0009ECI   D360 958D =001F7DI       LB    R6,PDB+21         GET THE HIGH ORDER THREE DIGITS OF  MDG10530
0009F0I   1168                     SLLS  R6,8              THE HIGH ADDRESS              MDG10540
0009F2I   D330 9588 =001F7EI       LB    R3,PDB+22                                       MDG10550
0009F6I   0663                     OAR   R6,R3                                           MDG10560
0009F8I   2761                     SIS   R6,1              SUBTRACT 1 FOR THE BORROW USED ABOVE  MDG10570
0009FAI   0B65                     SAR   R6,R5             SUBTRACT LOW (R5) FROM HIGH (R6)  MDG10580
0009FCI   4060 9818 =002218I       STH   R6,NUMBLK         STOR THE # OF FULL BLOCKS TO BE TRANS  MDG10590
000A00I   4300 802C =000A30I       B     UPDSPY                                          MDG10600
          0000 0A04I      LOFRHI   EQU   *                                               MDG10610
000A04I   0B65                     SAR   R6,R5             SUBTRACT LOW (R5) FROM HIGH (R6)  MDG10620
000A06I   C560 0000                CLHI  R6,X'00'          DIFFERENCE = 0 ?              MDG10630
000A0AI   2132                     BNES  LOHIK2            NO                            MDG10640
000A0CI   2461                     LIS   R6,1              YES - THEN SET 1              MDG10650
000A0EI   4060 9804 =002216I LOHIK2 STH  R6,LSTBLK         SAVE THE LENGTH               MDG10660
000A12I   D350 9564 =001F7AI       LB    R5,PDB+18         GET THE HIGH ORDER THREE DIGITS OF  MDG10670
000A16I   1158                     SLLS  R5,8              THE LOW ADDRESS               MDG10680
000A18I   D330 955F =001F7BI       LB    R3,PDB+19                                       MDG10690
000A1CI   0653                     OAR   R5,R3             R5 = HIGH ORDER OF LOW ADDRESS  MDG10700
000A1EI   D360 955B =001F7DI       LB    R6,PDB+21         GET THE HIGH ORDER THREE DIGITS OF  MDG10710
000A22I   1168                     SLLS  R6,8              THE HIGH ADDRESS              MDG10720
000A24I   D330 9556 =001F7EI       LB    R3,PDB+22                                       MDG10730
000A28I   0663                     OAR   R6,R3                                           MDG10740
000A2AI   0B65                     SAR   R6,R5                                           MDG10750
000A2CI   4060 97E8 =002218I       STH   R6,NUMBLK         STORE THE NUMBER OF FULL      MDG10760
          0000 0A30I      UPDSPY   EQU   *                 LOAD DISPLAY                  MDG10770
000A30I   2451                     LIS   R5,1              ADDRESS                       MDG10780
000A32I   0766                     XAR   R6,R6                                           MDG10790
000A34I   DE50 8033 =000A6BI       OC    R5,DSPCMD+1       INC MODE                      MDG10800
000A38I   D300 952D =001F69I       LB    R0,PDB+1                                        MDG10810
000A3CI   4130 924C =001C8CI       BAL   R3,ISHXCO                                       MDG10820
000A40I   0860                     LDAR  R6,R0                                           MDG10830
000A42I   1164                     SLLS  R6,4                                            MDG10840
000A44I   D300 9522 =001F6AI       LB    R0,PDB+2                                        MDG10850
000A48I   4130 9240 =001C8CI       BAL   R3,ISHXCO                                       MDG10860
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000A4CI  0660                            OAR   R6,R0                                              MDG10870
000A4EI  9A56                            WDR   R5,R6                                              MDG10880
000A50I  D300 9514 =001F68I              LB    R0,PDB                                             MDG10890
000A54I  4130 9234 =001C8CI              BAL   R3,ISHXCO                                          MDG10900
000A58I  9A50                            WDR   R5,R0                                              MDG10910
000A5AI  0700                            XAR   R0,R0                                              MDG10920
000A5CI  9A50                            WDR   R5,R0                                              MDG10930
000A5EI  9A50                            WDR   R5,R0                                              MDG10940
000A60I  DE50 8006 =000A6AI              OC    R5,DSPCMD                                          MDG10950
000A64I  5830 9764 =0021CCI              LDA   R3,MISTRN                                          MDG10960
000A68I  0303                            BR    R3                                                 MDG10970
000A6AI  8040                    DSPCMD  DC    X'8040'           NORM / INC                       MDG10980
         0000 0A6CI              DIMO    EQU   *                                                  MDG10990
                                 *  DISC INPUT - MAG TAPE OUTPUT                                  MDG11000
000A6CI  2441                            LIS   R4,1                                               MDG11010
000A6EI  4040 9798 =00220AI              STH   R4,EOJFLG                                          MDG11020
000A72I  4130 88D6 =00134CI              BAL   R3,UPDTPT         FIND THE STARTING POSITION       MDG11030
000A76I  4130 8D80 =0017FAI              BAL   R3,LIDAD                                           MDG11040
000A7AI  4130 8A54 =0014D2I              BAL   R3,DIRPGM         CONVERT THE POINTER TO LOC.      MDG11050
000A7EI  E650 94E6 =001F68I              LDAI  R5,PDB                                             MDG11060
000A82I  E660 9515 =001F9BI              LDAI  R6,PDB+51         *                       R04      MDG11070
000A86I  4130 87E4 =00126EI              BAL   R3,AVAILR         READ THE PDB FROM DISC           MDG11080
000A8AI  4130 FF28 =0009B6I              BAL   R3,MISTRT         SET THE NUM. OF BLKS. TO BE COPIED MDG11090
000A8EI  4130 8CF0 =001782I              BAL   R3,LODAD          LOAD THE OUTPUT DEV. ADD.        MDG11100
000A92I  9DA1                            SSR   RA,R1                                              MDG11110
000A94I  C310 0020                       THI   R1,X'20'          BOT ?                            MDG11120
000A98I  2335                            BZS   DIMO1             NO                               MDG11130
000A9AI  C810 00E0                       LHI   R1,X'E0'          YES - ERROR                      MDG11140
000A9EI  4300 9232 =001CD4I              B     ERRA                                               MDG11150
000AA2I  E650 94C2 =001F68I      DIMO1   LDAI  R5,PDB                                             MDG11160
000AA6I  E660 94F1 =001F9BI              LDAI  R6,PDB+51         WRITE PDB ON            R04      MDG11170
000AAAI  4130 8A8E =00153CI              BAL   R3,WRTPB          TAPE                             MDG11180
000AAEI  4130 8D48 =0017FAI      DIMONX  BAL   R3,LIDAD          LOAD IN ADD.                     MDG11190
000AB2I  E650 94E6 =001F9CI              LDAI  R5,WRTBUF         GET THE ADDRESS                  MDG11200
000AB6I  0865                            LDAR  R6,R5                                              MDG11210
000AB8I  4830 975C =002218I              LH    R3,NUMBLK         GET # OF BLOCKS                  MDG11220
*000ABCI 233E                            BZ    DIMOLB                                             MDG11230
*000ABEI CA60 00FF                       AAI   R6,X'FF'                                           MDG11240
000AC2I  2731                            SIS   R3,1                                               MDG11250
000AC4I  4030 9750 =002218I              STH   R3,NUMBLK                                          MDG11260
000AC8I  C830 00FF                       LHI   R3,X'FF'                                           MDG11270
000ACCI  4030 974A =00221AI      DIMO2X  STH   R3,CURBLK                                          MDG11280
000AD0I  4130 879A =00126EI              BAL   R3,AVAILR                                          MDG11290
000AD4I  4300 815A =000C32I              B     DIMO1X                                             MDG11300
         0000 0AD8I              DIMOLB  EQU   *                                                  MDG11310
000AD8I  4830 973A =002216I              LH    R3,LSTBLK                                          MDG11320
000ADCI  2336                            BZS   DIMONL                                             MDG11330
000ADEI  0A63                            AAR   R6,R3                                              MDG11340
000AE0I  0711                            XAR   R1,R1                                              MDG11350
000AE2I  4010 9730 =002216I              STH   R1,LSTBLK                                          MDG11360
000AE6I  220D                            BS    DIMO2X                                             MDG11370
000AE8I  4130 8004 =000AF0I      DIMONL  BAL   R3,COPDVE                                          MDG11380
000AECI  4300 80C2 =000BB2I              B     DIMOEE                                             MDG11390
000AF0I  5030 96F8 =0021ECI      COPDVE  STA   R3,DIRTN          NO DATA SHOULD BE LEFT FOR THIS  MDG11400
000AF4I  4080 972C =002224I              STH   R8,DIMOST         PROGRAM - SAVE CYL - HEAD - SECTOR MDG11410
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000AF8I  4880 9706 =002202I  1142          LH    R8,HEAD                          MDG11420
000AFCI  4080 9726 =002226I  1143          STH   R8,DIMOST+2      STORE HEAD        MDG11430
000B00I  4880 96FC =002200I  1144          LH    R8,CYL                           MDG11440
000B04I  4080 9720 =002228I  1145          STH   R8,DIMOST+4      STORE CYL         MDG11450
000B08I  4880 96A0 =0021ACI  1146          LH    R8,DCOPY         GET DIRECTORY INFO MDG11460
000B0CI  4830 969E =0021AEI  1147          LH    R3,DCOPY+2       SECTOR            MDG11470
000B10I  4030 96EE =002202I  1148          STH   R3,HEAD          HEAD              MDG11480
000B14I  4830 9698 =0021B0I  1149          LH    R3,DCOPY+4                         MDG11490
000B18I  4030 96E4 =002200I  1150          STH   R3,CYL                             MDG11500
000B1CI  4820 9692 =0021B2I  1151          LH    R2,DCOPY+6       INCREMENT         MDG11510
000B20I  2628                1152          AIS   R2,8                               MDG11520
000B22I  C520 0100           1153          CLHI  R2,X'100'        = X'100' ?        MDG11530
000B26I  4330 8054 =000B7EI  1154          BE    DIMOPP                             MDG11540
000B2AI  4020 9684 =0021B2I  1155  DIMOP5  STH   R2,DCOPY+6                         MDG11550
000B2EI  4130 8EDE =001A10I  1156          BAL   R3,FRSRW                           MDG11560
000B32I  4130 8EA8 =0019DEI  1157          BAL   R3,WDFT                            MDG11570
000B36I  DEA0 8D75 =0018AFI  1158          OC    RA,SEEK                            MDG11580
000B3AI  4130 8ED2 =001A10I  1159          BAL   R3,FRSRW                           MDG11590
000B3EI  E650 956A =002000I  1160          LDAI  R5,DIRECT        SET UP FOR READ   MDG11600
000B42I  E660 9665 =0021ABI  1161          LDAI  R6,DIRECT+255                      MDG11610
000B46I  4130 8E94 =0019DEI  1162          BAL   R3,WDFT                            MDG11620
000B4AI  4130 89CC =00151AI  1163          BAL   R3,RDISC         READ THE DIRECTORY MDG11630
000B4EI  4820 9660 =0021B2I  1164          LH    R2,DCOPY+6                         MDG11640
000B52I  4832 955A =0020B0I  1165          LH    R3,DIRECT+4(R2)  GET THE CYL FROM DIRECT MDG11650
000B56I  4530 96CE =002228I  1166          CLH   R3,DIMOST+4                        MDG11660
*000B5AI 213E                1167          BNE   DIMOSH                             MDG11670
 000B5CI 4830 96C6 =002226I  1168          LH    R3,DIMOST+2      HEAD              MDG11680
 000B60I D342 954F =0020B3I  1169          LB    R4,DIRECT+7(R2)  SET HEAD          MDG11690
 000B64I 0534                1170          CLAR  R3,R4                              MDG11700
 000B66I 2138                1171          BNES  DIMOSH                             MDG11710
 000B68I 4830 9688 =002224I  1172          LH    R3,DIMOST                          MDG11720
 000B6CI D342 9542 =0020B2I  1173          LB    R4,DIRECT+6(R2)                    MDG11730
 000B70I 0534                1174          CLAR  R3,R4                              MDG11740
 000B72I 4330 8036 =000BACI  1175          BE    DIMOSP                             MDG11750
 000B76I C810 00D0           1176  DIMOSH  LHI   R1,X'D0'                           MDG11760
 000B7AI 4300 9156 =001CD4I  1177          B     ERRA                               MDG11770
 000B7EI 2681                1178  DIMOPP  AIS   R8,1             INC. SECTOR       MDG11780
 000B80I 4840 968A =0022DEI  1179          LH    R4,CUTRKDEN                        MDG11790
 000B84I 4584 F9DC =000564I  1180          CLH   R8,SECTAB(R4)                      MDG11800
 000B88I 2334                1181          BES   DIMOP4           NO                MDG11810
 000B8AI 0722                1182          XAR   R2,R2            YES               MDG11820
 000B8CI 4300 FF9A =000B2AI  1183          B     DIMOP5                             MDG11830
 000B90I 4830 966E =002202I  1184  DIMOP4  LH    R3,HEAD          GET HEAD          MDG11840
 000B94I 4534 F9DA =000572I  1185          CLH   R3,HDTAB(R4)                       MDG11850
*000B98I 2338                1186          BE    DIMOSA                             MDG11860
 000B9AI 2631                1187          AIS   R3,1                               MDG11870
 000B9CI 4030 9662 =002202I  1188          STH   R3,HEAD                            MDG11880
 000BA0I 0722                1189          XAR   R2,R2                              MDG11890
 000BA2I 0788                1190          XAR   R8,R8                              MDG11900
 000BA4I 4300 FF82 =000B2AI  1191          B     DIMOP5                             MDG11910
 000BA8I 4020 9606 =0021B2I  1192  DIMOSA  STH   R2,DCOPY+6                         MDG11920
 000BACI 5830 963C =0021ECI  1193  DIMOSP  LDA   R3,DIRTN                          MDG11930
 000BB0I 0303                1194          BR    R3                                 MDG11940
 000BB2I 4130 8BCC =001782I  1195  DIMOEE  BAL   R3,LODAD         GET INPUT DEV.    MDG11950
 000BB6I DEA0 8CF1 =0018ABI  1196          OC    RA,WFM                             MDG11960
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000BBAI  4100 8DC2 =00198UI  1197          BAL   R0,NOMOTN                                    MDG11970
000BBEI  DEA0 8CE9 =0018ABI  1198          OC    RA,WFM          WRITE EOV ON TAPE            MDG11980
000BC2I  4100 8DBA =00198UI  1199          BAL   R0,NOMOTN                                    MDG11990
000BC6I  DEA0 8CE3 =0018ADI  1200          OC    RA,BKSP                                      MDG12000
000BCAI  4100 8DB2 =00198UI  1201          BAL   R0,NOMOTN                                    MDG12010
000BCEI  4130 8DF2 =0019C4I  1202          BAL   R3,LOKOUT       LOCK THE OUTPUT DEVICE       MDG12020
         0000 0BD2I          1203  DICOMN  EQU   *               DISC INPUT COMMON            MDG12030
000BD2I  4130 8C24 =0017FAI  1204          BAL   R3,LIDAD        LOAD INPUT DEVICE            MDG12040
000BD6I  4820 95D8 =0021B2I  1205          LH    R2,DCOPY+6                                   MDG12050
000BDAI  C520 0100           1206          CLHI  R2,X'100'       = TO X'100' ?                MDG12060
000BDEI  4330 8044 =000C26I  1207          BE    DIMOEV                                       MDG12070
000BE2I  4832 94C6 =0020ACI  1208          LH    R3,DIRECT(R2)   NO - EOV?                    MDG12080
000BE6I  4330 803C =000C26I  1209          BZ    DIMOEV          YES                          MDG12090
000BEAI  4530 95D2 =0021C0I  1210          CLH   R3,PGMNUM       NO - FIRST TWO DIGITS = ?    MDG12100
000BEEI  4230 8020 =000C12I  1211          BNE   DIMONM          COPY ANOTHER                 MDG12110
000BF2I  D332 94B8 =0020AEI  1212          LB    R3,DIRECT+2(R2) GET THIRD DIGIT              MDG12120
000BF6I  D340 95C8 =0021C2I  1213          LB    R4,PGMNUM+2                                  MDG12130
000BFAI  0534                1214          CLAR  R3,R4           = ?                          MDG12140
000BFCI  213B                1215          BNES  DIMONM          NO - COPY ANOTHER            MDG12150
000BFEI  4830 95BE =0021C0I  1216          LH    R3,PGMNUM       YES - COPY NO MORE           MDG12160
000C02I  4030 92E6 =001EECI  1217          STH   R3,PGMIPN       UPDATE LOCK WORD             MDG12170
000C06I  D240 92E4 =001EEEI  1218          STB   R4,PGMIPN+2                                  MDG12180
000C0AI  4130 8DC2 =0019D0I  1219          BAL   R3,ZSEQ                                      MDG12190
000C0EI  4300 8AAE =0016C0I  1220          B     PEOJ                                         MDG12200
         0000 0C12I          1221  DIMONM  EQU   *               UPDATE THE LOCK WORD         MDG12210
000C12I  4832 9496 =0020ACI  1222          LH    R3,DIRECT(R2)   SO THAT IT WILL BE FOUND     MDG12220
000C16I  4030 92D2 =001EECI  1223          STH   R3,PGMIPN       ON THE NEXT SEARCH           MDG12230
000C1AI  D332 9490 =0020AEI  1224          LB    R3,DIRECT+2(R2)                              MDG12240
000C1EI  D230 92CC =001EEEI  1225          STB   R3,PGMIPN+2                                  MDG12250
000C22I  4300 FB6C =000792I  1226          B     COPY1                                        MDG12260
000C26I  4130 8D8E =0019B8I  1227  DIMOEV  BAL   R3,LOKIN         LOCK INDEV                   MDG12270
000C2AI  4130 8DA2 =0019D0I  1228          BAL   R3,ZSEQ                                      MDG12280
000C2EI  4300 F86A =00049CI  1229          B     PEOV                                         MDG12290
         0000 0C32I          1230  DIMO1X  EQU   *                                            MDG12300
000C32I  4130 8B4C =001782I  1231          BAL   R3,LODAD        LOAD THE OUTPUT DEVICE ADDRESSES MDG12310
000C36I  E650 9362 =001F9CI  1232          LDAI  R5,WRTBUF                                    MDG12320
000C3AI  0865                1233          LDAR  R6,R5                                        MDG12330
000C3CI  4830 95DA =00221AI  1234          LH    R3,CURBLK       GET THE SIZE                 MDG12340
000C40I  0A63                1235          AAR   R6,R3                                        MDG12350
000C42I  4130 88F6 =00153CI  1236          BAL   R3,WRTPR                                     MDG12360
000C46I  4300 FE64 =000AAEI  1237          B     DIMONX                                       MDG12370
                             1238  *  DISC INPUT - DISC OUTPUT                               MDG12380
         0000 0C4AI          1239  DIDO    EQU   *                                            MDG12390
000C4AI  2441                1240          LIS   R4,1                                         MDG12400
000C4CI  4040 95BA =00220AI  1241          STH   R4,EOJFLG                                    MDG12410
000C50I  4130 86F8 =00134CI  1242          BAL   R3,UPDTPT       FIND THE STARTING POSITION   MDG12420
000C54I  4130 8BA2 =0017FAI  1243          BAL   R3,LIDAD                                     MDG12430
000C58I  4130 8876 =0014D2I  1244          BAL   R3,DIRPGM       CONVERT TO ACTUAL LOCATION   MDG12440
000C5CI  E650 9308 =001F68I  1245          LDAI  R5,PDB                                       MDG12450
000C60I  E660 9337 =001F98I  1246          LDAI  R6,PDB+51       *                      R04   MDG12460
000C64I  4130 8606 =00126EI  1247          BAL   R3,AVAILR       READ THE PDB FROM DISC       MDG12470
000C68I  4130 FD4A =0009B6I  1248          BAL   R3,MISTRT       SET THE NUM. OF BLKS. TO BE COPIED MDG12480
000C6CI  4080 95BA =00222AI  1249          STH   R8,DIDOIN       SAVE INPUT POINTERS          MDG12490
000C70I  4880 958E =0022U2I  1250          LH    R8,HEAD                                      MDG12500
000C74I  4080 9584 =00222CI  1251          STH   R8,DIDOIN+2                                  MDG12510
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000C78I  4880 9584 =002200I   1252            LH    R8,CYL                                          MDG12520
000C7CI  4080 95AE =00222EI   1253            STH   R8,DIDOIN+4                                     MDG12530
000C80I  4130 8AFE =001782I   1254            BAL   R3,LODAD        LOAD OUTPUT                     MDG12540
000C84I  E630 8008 =000C90I   1255            LDAI  R3,DIDO11       SET THE COPY FLAG               MDG12550
000C88I  5030 9548 =0021D4I   1256            STA   R3,CPYFLG                                       MDG12560
000C8CI  4300 83AC =00103CI   1257            B     CREDIS          WRITE PDB ON SECOND DISC        MDG12570
000C90I  4080 959C =00223UI   1258  DIDO11    STH   R8,DIDOOU                                       MDG12580
000C94I  4880 956A =002202I   1259            LH    R8,HEAD         SAVE OUTPUT POINTERS            MDG12590
000C98I  4080 9596 =002232I   1260            STH   R8,DIDOOU+2                                     MDG12600
000C9CI  4880 9560 =002200I   1261            LH    R8,CYL                                          MDG12610
000CA0I  4080 9590 =002234I   1262            STH   R8,DIDOOU+4                                     MDG12620
000CA4I  4130 8852 =0017FAI   1263            BAL   R3,LIDAD        LOAD INPUT DEVICE ADD'.         MDG12630
000CA8I  4880 9582 =00222EI   1264            LH    R8,DIDOIN+4                                     MDG12640
000CACI  4080 9550 =002200I   1265            STH   R8,CYL          GET INPUT DISC PARAMETERS       MDG12650
000CB0I  4880 9578 =00222CI   1266            LH    R8,DIDOIN+2     CYL                             MDG12660
000CB4I  4080 954A =002202I   1267            STH   R8,HEAD         HEAD                            MDG12670
000CB8I  4880 956E =00222AI   1268            LH    R8,DIDOIN       SECTOR                          MDG12680
000CBCI  E650 92DC =001F9CI   1269            LDAI  R5,WRTBUF                                       MDG12690
000CC0I  0865                 1270            LDAR  R6,R5           SET UP TO READ                  MDG12700
000CC2I  4830 9552 =002218I   1271            LH    R3,NUMBLK       ANOTHER BLOCK                   MDG12710
*000CC6I 2330                 1272            BZ    DIDOLB                                          MDG12720
*000CC8I CA60 00FF            1273            AAI   R6,X'FF'                                        MDG12730
000CCCI  2731                 1274            SIS   R3,1                                            MDG12740
000CCEI  4030 9546 =002218I   1275            STH   R3,NUMBLK                                       MDG12750
000CD2I  C830 00FF            1276            LHI   R3,X'FF'                                        MDG12760
000CD6I  4030 9540 =00221AI   1277  DIDO2X    STH   R3,CURBLK                                       MDG12770
000CDAI  4130 8590 =00126EI   1278            BAL   R3,AVAILR       READ FROM INPUT DISC            MDG12780
000CDEI  230D                 1279            BS    DIDO1X                                          MDG12790
         0000 0CE0I           1280  DIDOLB    EQU   *                                               MDG12800
000CE0I  4830 9532 =002216I   1281            LH    R3,LSTBLK       LAST BLOCK ?                    MDG12810
000CE4I  2336                 1282            BZS   DIDONL          NO - NONE LEFT                  MDG12820
000CE6I  0A63                 1283            AAR   R6,R3           YES                             MDG12830
000CE8I  0711                 1284            XAR   R1,R1                                           MDG12840
000CEAI  4010 9528 =002216I   1285            STH   R1,LSTBLK                                       MDG12850
000CEEI  220C                 1286            BS    DIDO2X                                          MDG12860
000CF0I  4130 FDFC =000AF0I   1287  DIDONL    BAL   R3,COPDVE       IS THIS TRUELY THE END ??       MDG12870
000CF4I  4300 8040 =000D38I   1288            B     DIDOEE          YES                             MDG12880
000CF8I  4080 952E =00222AI   1289  DIDO1X    STH   R8,DIDOIN                                       MDG12890
000CFCI  4880 9502 =002202I   1290            LH    R8,HEAD         SAVE THE INPUT PARMS.           MDG12900
000D00I  4080 9528 =00222CI   1291            STH   R8,DIDOIN+2                                     MDG12910
000D04I  4880 94F8 =002200I   1292            LH    R8,CYL                                          MDG12920
000D08I  4080 9522 =00222EI   1293            STH   R8,DIDOIN+4                                     MDG12930
000D0CI  4880 9524 =002234I   1294            LH    R8,DIDOOU+4     LOAD THE OUTPUT PARMS           MDG12940
000D10I  4080 94EC =002200I   1295            STH   R8,CYL          CYL                             MDG12950
000D14I  4880 951A =002232I   1296            LH    R8,DIDOOU+2     HEAD                            MDG12960
000D18I  4080 94E6 =002202I   1297            STH   R8,HEAD                                         MDG12970
000D1CI  4880 9510 =002230I   1298            LH    R8,DIDOOU       LOAD THE SECTOR                 MDG12980
000D20I  4130 8A5E =001782I   1299            BAL   R3,LODAD        LOAD OUTPUT ADDRESSES           MDG12990
000D24I  E650 9274 =001F9CI   1300            LDAI  R5,WRTBUF                                       MDG13000
000D28I  0865                 1301            LDAR  R6,R5                                           MDG13010
000D2AI  4830 94EC =00221AI   1302            LH    R3,CURBLK                                       MDG13020
000D2EI  0A63                 1303            AAR   R6,R3                                           MDG13030
000D30I  4130 8542 =001276I   1304            BAL   R3,AVAIL0       WRITE TO THE DISC               MDG13040
000D34I  4300 FF58 =000C90I   1305            B     DIDO11                                          MDG13050
         0000 0D38I           1306  DIDOEE    EQU   *               SAVE THE DIRECTORY PARMS        MDG13060
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000D38I  4080 94EE =00222AI  1307          STH   R8,DIDOIN                                                    MDG13070
000D3CI  4880 94C2 =002202I  1308          LH    R8,HEAD                                                      MDG13080
000D40I  4080 94E8 =00222CI  1309          STH   R8,DIDOIN+2                                                  MDG13090
000D44I  4880 94B8 =002200I  1310          LH    R8,CYL                                                       MDG13100
000D48I  4080 94E2 =00222EI  1311          STH   R8,DIDOIN+4                                                  MDG13110
000D4CI  4130 8A32 =001782I  1312          BAL   R3,LODAD                                                     MDG13120
000D50I  4830 9348 =00209CI  1313          LH    R3,DIRPRM          LOAD THE OUTPUT DIRECTORY IN BUFFER       MDG13130
000D54I  4030 94AA =002202I  1314          STH   R3,HEAD                                                      MDG13140
000D58I  4880 9342 =00209EI  1315          LH    R8,DIRPRM+2                                                  MDG13150
000D5CI  D320 F2EA =00004AI  1316          LB    R2,SOD             GET START                                 MDG13160
000D60I  4020 949C =002200I  1317          STH   R2,CYL                                                       MDG13170
000D64I  4130 8CA8 =001A10I  1318          BAL   R3,FRSRW                                                     MDG13180
000D68I  4130 8C72 =0019DEI  1319          BAL   R3,WDFT                                                      MDG13190
000D6CI  DEA0 8B3F =0018AFI  1320          OC    RA,SEEK                                                      MDG13200
000D70I  4130 8C9C =001A10I  1321          BAL   R3,FRSRW                                                     MDG13210
000D74I  E650 9334 =0020ACI  1322          LDAI  R5,DIRECT                                                    MDG13220
000D78I  E660 942F =0021ABI  1323          LDAI  R6,DIRECT+255                                                MDG13230
000D7CI  4130 8C5E =0019DEI  1324          BAL   R3,WDFT                                                      MDG13240
000D80I  4130 8796 =00151AI  1325          BAL   R3,RDISC                                                     MDG13250
000D84I  4880 94AC =002234I  1326          LH    R8,DIDOOU+4          LOAD THE OUTPUT PARMS                 MDG13260
000D88I  4080 9474 =002200I  1327          STH   R8,CYL               CYL                                   MDG13270
000D8CI  4880 94A2 =002232I  1328          LH    R8,DIDOOU+2          HEAD                                  MDG13280
000D90I  4080 946E =002202I  1329          STH   R8,HEAD                                                      MDG13290
000D94I  4880 9498 =002230I  1330          LH    R8,DIDOOU            SECTOR                                MDG13300
000D98I  4130 83BC =001158I  1331          BAL   R3,DTRDON            WRITE EOV ON THE DISC                 MDG13310
000D9CI  4880 948E =00222EI  1332          LH    R8,DIDOIN+4          LOAD THE INPUT PARMS                  MDG13320
000DA0I  4080 945C =002200I  1333          STH   R8,CYL               CYL                                   MDG13330
000DA4I  4880 9484 =00222CI  1334          LH    R8,DIDOIN+2          HEAD                                  MDG13340
000DA8I  4080 9456 =002202I  1335          STH   R8,HEAD                                                      MDG13350
000DACI  4880 947A =00222AI  1336          LH    R8,DIDOIN            SECTOR                                MDG13360
000DB0I  4130 8A46 =0017FAI  1337          BAL   R3,LIDAD             LOAD INPUT ADDRESSES                  MDG13370
000DB4I  4130 8C58 =001A10I  1338          BAL   R3,FRSRW                                                     MDG13380
000DB8I  4130 8C22 =0019DEI  1339          BAL   R3,WDFT              SET UP FILR                           MDG13390
000DBCI  DEA0 8AEF =0018AFI  1340          OC    RA,SEEK                                                      MDG13400
000DC0I  4130 8C4C =001A10I  1341          BAL   R3,FRSRW             SEEK                                  MDG13410
000DC4I  E650 92E4 =0020ACI  1342          LDAI  R5,DIRECT            SET UP FOR READ                       MDG13420
000DC8I  E660 93DF =0021ABI  1343          LDAI  R6,DIRECT+255                                                MDG13430
000DCCI  4130 8C0E =0019DEI  1344          BAL   R3,WDFT                                                      MDG13440
000DD0I  4130 8746 =00151AI  1345          BAL   R3,RDISC             READ INPUT DIRECTORY                  MDG13450
000DD4I  4300 FDFA =000BD2I  1346          B     DICOMN                                                       MDG13460
                             1347  ********************************************************************     MDG13470
                             1348  *                                                                  *     MDG13480
                             1349  *  I N I T                                                         *     MDG13490
                             1350  *                                                                  *     MDG13500
                             1351  ********************************************************************     MDG13510
                             1352  *                                                                  *     MDG13520
                             1353  *    THIS ROUTINE IS USED TO INITIALIZE A MAG TAPE - CASSETTE -     *     MDG13530
                             1354  *    OR DISC.                                                      *     MDG13540
                             1355  *          DEVICE            OPERATION PERFORMED                   *     MDG13550
                             1356  *                                                                  *     MDG13560
                             1357  *          MAG TAPE                                                *     MDG13570
                             1358  *          CASSETTE          THE TAPE IS CHECKED TO BE SURE        *     MDG13580
                             1359  *                            THE TAPE IS AT LOAD POINT.            *     MDG13590
                             1360  *                            1. A FILE MARK IS WRITTEN             *     MDG13600
                             1361  *                            2. BACKSPACE OVER THE FILE MARK       *     MDG13610
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                              *                    3. WRITE THE BOOT LOADER                *   MDG13620
                              *                    4. WRITE A FILE MARK                    *   MDG13630
                              *                                                            *   MDG13640
                              *          DISC      1. VERIFY THAT START CYLINDER IS        *   MDG13650
                              *                       ERROR FREE. (NO DEFECTIVE SECTOR     *   MDG13660
                              *                       BITS SET)                            *   MDG13670
                              *                    2. ZERO OUT START CYLINDER.             *   MDG13680
                              *                    3. VERIFY THAT NEXT CYLINDER IS ERROR   *   MDG13690
                              *                       FREE (NO DEFECTIVE SECTOR BITS SET)  *   MDG13700
                              *                                                            *   MDG13710
                              *                    4. SECTOR ZERO, START CYLINDER IS INIT- *   MDG13720
                              *                       IALIZED TO INDICATE THAT KNOWN DATA  *   MDG13730
                              *                       IS ON THE DISC                       *   MDG13740
                              *                                                            *   MDG13750
                              *                                                            *   MDG13760
                              **************************************************************   MDG13770
 0000D8I  4130 89A6 =001782I  INIT    BAL   R3,LODAD        LOAD DEVICE ADDRESSES              MDG13780
 000DDCI  C510 0003                   CLHI  R1,3                                               MDG13790
 000DE0I  4280 8104 =000EE8I          BL    INTAPE          INITIALIZE THE TAPE.               MDG13800
 000DE4I  2441                        LIS   R4,1            SET THE EOJ                        MDG13810
 000DE6I  4040 9420 =00220AI          STH   R4,EOJFLG       FLAG                               MDG13820
 000DEAI  DEB0 8ABE =0018ACI          OC    RB,STOP         STOP THE SELCH                     MDG13830
 000DEEI  DEC0 8ABE =0018B0I          OC    RC,RESET        NO - RESET THE CONTROLLER          MDG13840
 000DF2I  0733                        XAR   R3,R3           NO                                 MDG13850
 000DF4I  9DA1                IDWT    SSR   RA,R1           WAIT FOR DISC ADD. INTER. = 0      MDG13860
 000DF6I  C310 0010                   THI   R1,X'10'                                           MDG13870
 000DFAI  2033                        BNZS  IDWT                                               MDG13880
 000DFCI  D310 F24A =00004AI          LB    R1,SOD          GET START                          MDG13890
 000E00I  4010 93FC =002200I          STH   R1,CYL                                             MDG13900
 000E04I  4130 8BD6 =0019DEI          BAL   R3,WDFT                                            MDG13910
 000E08I  DEA0 8AA5 =0018B1I          OC    RA,RESTOR       RESTORE THE FILE                   MDG13920
 000E0CI  4130 8C00 =001A10I          BAL   R3,FRSRW                                           MDG13930
 000E10I  0700                        XAR   R0,R0                                              MDG13940
 000E12I  2410                        LIS   R1,0                                               MDG13950
 000E14I  2422                        LIS   R2,2                                               MDG13960
 000E16I  C830 00FE                   LHI   R3,X'FE'                                           MDG13970
 000E1AI  4001 917E =001F9CI  INITZF  STH   R0,WRTBUF(R1)                                      MDG13980
 000E1EI  C110 FFF8 =000E1AI          BXLE  R1,INITZF                                          MDG13990
 000E22I  4130 8BB8 =0019DEI  INITSK  BAL   R3,WDFT                                            MDG14000
 000E26I  DEA0 8A85 =0018AFI          OC    RA,SEEK         SEEK                               MDG14010
 000E2AI  4130 8BE2 =001A10I          BAL   R3,FRSRW                                           MDG14020
 000E2EI  2430                        LIS   R3,0            SET HEAD TO                        MDG14030
 000E30I  4030 93CE =002202I          STH   R3,HEAD         ZERO                               MDG14040
 000E34I  0788                SRCK1X  XAR   R8,R8           SET THE SECTOR TO ZERO             MDG14050
 000E36I  4130 8BA4 =0019DEI  SRCK1   BAL   R3,WDFT                                            MDG14060
 000E3AI  4130 8BF8 =001A36I          BAL   R3,RCHK         READ CHECK THE SECTOR              MDG14070
 000E3EI  4830 93B2 =0021F4I          LH    R3,CONSTA       GET THE STATUS                     MDG14080
 000E42I  C330 0020                   THI   R3,X'20'                                           MDG14090
 000E46I  4230 8096 =000EE0I          BNZ   PNGS            DEFECTIVE TRACK BRANCH             MDG14100
 000E4AI  E650 914E =001F9CI          LDAI  R5,WRTBUF                                          MDG14110
 000E4EI  0865                        LDAR  R6,R5                                              MDG14120
*000E50I  CA60 00FF                   AAI   R6,X'FF'                                           MDG14130
 000E54I  4130 8B86 =0019DEI          BAL   R3,WDFT                                            MDG14140
 000E58I  4130 86C4 =001520I          BAL   R3,WDISC                                           MDG14150
          0000 0E5CI          SRCK2   EQU   *                                                  MDG14160
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 000E5CI  4830 9364 =0021C4I   1417           LH    R3,TRKDEN          LOAD TRKDEN                            MDG14170
 000E60I  2681                 1418           AIS   R8,1               INCRIMENT SECTOR                       MDG14180
 000E62I  4583 F6FE =000564I   1419           CLH   R8,SECTAB(R3)      MORE SECTORS ?                         MDG14190
 000E66I  2333                 1420           BES   SRCK4              NO                                     MDG14200
 000E68I  4300 FFCA =000E36I   1421           B     SRCK1                                                     MDG14210
 000E6CI  4820 9392 =002202I   1422  SRCK4    LH    R2,HEAD                                                   MDG14220
 000E70I  4523 F6FE =000572I   1423           CLH   R2,HDTAB(R3)       MAXIMUM?                               MDG14230
*000E74I  2338                 1424           BE    SRCEND             YES - FINISHED                         MDG14240
 000E76I  4800 9388 =002202I   1425           LH    R0,HEAD            LOAD HEAD                              MDG14250
 000E7AI  2601                 1426           AIS   R0,1               INCRIMENT                              MDG14260
 000E7CI  4000 9382 =002202I   1427           STH   R0,HEAD            SAVE                                   MDG14270
 000E80I  4300 FFB0 =000E34I   1428           B     SRCK1X                                                    MDG14280
 000E84I  4810 9378 =002200I   1429  SRCEND   LH    R1,CYL             GET CURRENT                            MDG14290
 000E88I  D410 F1BF =00004BI   1430           CLB   R1,SOP             FIRST PROGRAM CYLINDER CHECKED??       MDG14300
*000E8CI  2337                 1431           BE    WINIFO             YES                                    MDG14310
 000E8EI  D310 F1B9 =00004BI   1432           LB    R1,SOP             GET FIRST PROGRAM CYLINDER             MDG14320
 000E92I  4010 936A =002200I   1433           STH   R1,CYL             MAKE CURRENT                           MDG14330
 000E96I  4300 FF88 =000E22I   1434           B     INITSK             CHECK IT                               MDG14340
 000E9AI  D310 F1AC =00004AI   1435  WINIFO   LB    R1,SOD             GET START                              MDG14350
 000E9EI  4010 935E =002200I   1436           STH   R1,CYL             MAKE CURRENT                           MDG14360
 000EA2I  0788                 1437           XAR   R8,R8              SET SECTOR TO ZERO                     MDG14370
 000EA4I  4080 935A =002202I   1438           STH   R8,HEAD            SET HEAD TO ZERO                       MDG14380
 000EA8I  4130 8B32 =0019DEI   1439           BAL   R3,WDFT                                                   MDG14390
 000EACI  DEA0 89FF =0018AFI   1440           OC    RA,SEEK            SEEK                                   MDG14400
 000EB0I  4130 8B5C =001A10I   1441           BAL   R3,FRSRW           WAIT                                   MDG14410
 000EB4I  C810 EEEE            1442           LHI   R1,X'EEEE'                                                MDG14420
 000EB8I  4010 90E0 =001F9CI   1443           STH   R1,WRTBUF          INIT. THE FIRST SECTOR                 MDG14430
 000EBCI  4010 90DE =001F9EI   1444           STH   R1,WRTBUF+2                                               MDG14440
 000EC0I  4010 90DC =001FA0I   1445           STH   R1,WRTBUF+4                                               MDG14450
 000EC4I  4010 90DA =001FA2I   1446           STH   R1,WRTBUF+6                                               MDG14460
 000EC8I  D330 F17F =00004BI   1447           LB    R3,SOP             GET START                              MDG14470
 000ECCI  D230 90D9 =001FA9I   1448           STB   R3,WRTBUF+13                                              MDG14480
 000ED0I  4130 8B0A =0019DEI   1449           BAL   R3,WDFT                                                   MDG14490
 000ED4I  4130 8648 =00152ØI   1450           BAL   R3,WDISC           WRITE TO THE DISC                      MDG14500
 000ED8I  4130 8AE8 =0019C4I   1451           BAL   R3,LOKOUT          LOCK THE OUTPUT DEVICE                 MDG14510
 000EDCI  4300 87E0 =0016C0I   1452           B     PEOJ                                                      MDG14520
 000EE0I  C810 00E2            1453  PNGS     LHI   R1,X'E2'           PRINT DISC PACK UNUSABLE               MDG14530
 000EE4I  4300 8DEC =001CD4I   1454           B     ERRA                                                      MDG14540
          0000 0EE8I           1455  INTAPE   EQU   *                                                         MDG14550
 000EE8I  9DA1                 1456           SSR   RA,R1                                                     MDG14560
 000EEAI  C310 0020            1457           THI   R1,X'20'                                                  MDG14570
 000EEEI  2135                 1458           BNZS  INTP1                                                     MDG14580
 000EF0I  C810 00E1            1459           LHI   R1,X'E1'                                                  MDG14590
 000EF4I  4300 8DDC =001CD4I   1460           B     ERRA                                                      MDG14600
          0000 0EF8I           1461  INTP1    EQU   *                                                         MDG14610
 000EF8I  2441                 1462           LIS   R4,1                                                      MDG14620
 000EFAI  4040 930C =00220AI   1463           STH   R4,EOJFLG                                                 MDG14630
 000EFEI  DEA0 89A8 =0018AAI   1464           OC    RA,DISABL                                                 MDG14640
 000F02I  DEA0 89A5 =0018ABI   1465           OC    RA,WFM             WRITE A FILE MARK                      MDG14650
 000F06I  9DA1                 1466           SSR   RA,R1                                                     MDG14660
 000F08I  C310 0010            1467           THI   R1,X'10'                                                  MDG14670
 000F0CI  4230 871C =00162CI   1468           BNZ   NORUN                                                     MDG14680
 000F10I  4100 8A6C =001980I   1469           BAL   R0,NOMOTN          WAIT FOR NO MOTION                     MDG14690
 000F14I  DEA0 8995 =0018ADI   1470           OC    RA,BKSP            BACKSPACE OVER THE                     MDG14700
 000F18I  4100 8A64 =001980I   1471           BAL   R0,NOMOTN          WAIT FOR NO MOTION                     MDG14710
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000F1CI  E650 8DE6 =001D06I  1472          LDAI  R5,MTBOOT                                    MDG14720
000F20I  E660 8E31 =001D55I  1473          LDAI  R6,MTBOOT+79                                 MDG14730
000F24I  4130 8614 =00153CI  1474          BAL   R3,WRTPB                                     MDG14740
000F28I  E650 8E2E =001D5AI  1475          LDAI  R5,MTLOADS          SET THE START ADDRESS     MDG1475
000F2CI  E660 8F99 =001EC9I  1476          LDAI  R6,MTLOADE          SET THE END ADDRESS       MDG1476
000F30I  4130 8608 =00153CI  1477          BAL   R3,WRTPB                                     MDG14770
000F34I  4130 8A8C =0019C4I  1478          BAL   R3,LOKOUT           LOCK THE OUTPUT DEVICE   MDG14780
000F38I  4300 876C =0016A8I  1479          B     EOV                                          MDG14790
                             1480  ********************************************************************** MDG14800
                             1481  *                                                                    * MDG14810
                             1482  *  C R E A T E                                                       * MDG14820
                             1483  *                                                                    * MDG14830
                             1484  ********************************************************************** MDG14840
                             1485  *                                                                    * MDG14850
                             1486  *   THIS ROUTINE WILL COPY A PROGRAM FROM MEMORY TO THE SPECIFIED     * MDG14860
                             1487  *   OUTPUT DEVICE. THE OPTION "LIMITS" IS USED TO SET THE BOUNDRIES  * MDG14870
                             1488  *   FOR THE PROGRAM TO BE COPIED. THE PDB IS FORMATTED WITH THE       * MDG14880
                             1489  *   OPTIONS "SEQNAM" - "LIMITS" - "LOW" - "HIGH" - AND THE CHKSUM    * MDG14890
                             1490  *   IS CALCULATED AND PLACED IN THE BLOCK. THE PDB FOLLOWED BY THE    * MDG14900
                             1491  *   PROGRAM IS COPIED TO THE OUTDEV MEDIA.                           * MDG14910
                             1492          ALIGN 8                                              MDG14920
000F40I                      1493  CREA    EQU   *                                              MDG14930
         0000 0F40I          1494          LIS   R3,0                SET THE CREATE INDICATOR  MDG14940
000F40I  2430                1495          STA   R3,CPYFLG           SAVE RETURN              MDG14950
000F42I  5030 928E =0021D4I  1496          LH    R0,SEQNAM                                      MDG14960
000F46I  4800 901E =001F68I  1497          CLHI  R0,X'2020'                                     MDG14970
000F4AI  C500 2020           1498          BE    CREAER                                         MDG14980
000F4EI  4330 81FE =001150I  1499          CLHI  R0,X'3030'          SEQNAM = 0               MDG14990
000F52I  C500 3030           1500          BNES  CREA1               NO                       MDG15000
000F56I  2137                1501          LB    R0,SEQNAM+2         SECOND HW = 0            MDG15010
000F58I  D300 900E =001F6AI  1502          CLHI  R0,X'30'                                       MDG15020
000F5CI  C500 0030           1503          BE    CREAER                                         MDG15030
000F60I  4330 81EC =001150I  1504  CREA1   LHI   R3,18                                         MDG15040
000F64I  C830 0012           1505          LIS   R5,0                SET FLAG                 MDG15050
000F68I  2450                1506          LDA   R0,LOW                                         MDG15060
000F6AI  5800 8F5E =001ECCI  1507  CREA3   LHI   R4,X'F0'                                       MDG15070
000F6EI  C840 00F0           1508          SLLS  R4,12                                          MDG15080
000F72I  114C                1509          NAR   R4,R0                                          MDG15090
000F74I  0440                1510          SRLS  R4,8                                           MDG15100
000F76I  1048                1511          SRLS  R4,8                                           MDG15110
000F78I  1048                1512          STB   R4,PDB(R3)                                     MDG15120
000F7AI  D243 8FEA =001F68I  1513          AIS   R3,1                                           MDG15130
000F7EI  2631                1514          LHI   R4,X'FF00'                                     MDG15140
000F80I  C840 FF00           1515          NAR   R4,R0                                          MDG15150
000F84I  0440                1516          SRLS  R4,8                                           MDG15160
000F86I  1048                1517          STB   R4,PDB(R3)                                     MDG15170
000F88I  D243 8FDC =001F68I  1518          AIS   R3,1                                           MDG15180
000F8CI  2631                1519          LHI   R4,X'00FF'                                     MDG15190
000F8EI  C840 00FF           1520          NAR   R4,R0                                          MDG15200
000F92I  0440                1521          STB   R4,PDB(R3)                                     MDG15210
000F94I  D243 8FD0 =001F68I  1522          AIS   R3,1                                           MDG15220
000F98I  2631                1523          CLHI  R5,0                                           MDG15230
000F9AI  C550 0000           1524          BNES  CRECHK                                         MDG15240
000F9EI  2136                1525          LIS   R5,15                                          MDG15250
000FA0I  245F                1526          LDA   R0,HIGH                                        MDG15260
000FA2I  5800 8F2A =001ED0I
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 000FA6I  4300 FFC4 =000F6EI   1527            B     CREA3                                                MDG15270
 000FAAI  2450                 1528  CRECHK    LIS   R5,0             CALCULATE THE                       MDG15280
 000FACI  5840 8F1C =001ECCI   1529            LDA   R4,LOW           CHKSUM BYTE                         MDG15290
 000FB0I  D324 0000            1530  CHK1      LB    R2,0(R4)                                             MDG15300
 000FB4I  0752                 1531            XAR   R5,R2                                                MDG15310
 000FB6I  2641                 1532            AIS   R4,1                                                 MDG15320
 000FB8I  5540 8F14 =001ED0I   1533            CLA   R4,HIGH                                              MDG15330
 000FBCI  2086                 1534            BLS   CHK1                                                 MDG15340
 000FBEI  D324 0000            1535            LB    R2,0(R4)                                             MDG15350
 000FC2I  0752                 1536            XAR   R5,R2                                                MDG15360
 000FC4I  D253 8FA0 =001F68I   1537            STB   R5,PDB(R3)                                           MDG15370
 000FC8I  2631                 1538            AIS   R3,1                                                 MDG15380
 000FCAI  2455                 1539            LIS   R5,5                                                 MDG15390
 000FCCI  D343 8F98 =001F68I   1540            LB    R4,PDB(R3)       LOAD EXTENSION DELIMITER            MDG15400
 000FD0I  C540 002E            1541            CLHI  R4,C'.'          EXISTS?                             MDG15410
*000FD4I  2133                 1542            BNE   CHK2             NO                                  MDG15420
 000FD6I  2752                 1543            SIS   R5,2             SET CLEAR COUNT                     MDG15430
 000FD8I  2632                 1544            AIS   R3,2             SET POINTER                         MDG15440
 000FDAI  2440                 1545  CHK2      LIS   R4,0                                                 MDG15450
 000FDCI  D243 8F88 =001F68I   1546            STB   R4,PDB(R3)                                           MDG15460
 000FE0I  2631                 1547            AIS   R3,1                                                 MDG15470
 000FE2I  2751                 1548            SIS   R5,1                                                 MDG15480
 000FE4I  2035                 1549            BNZS  CHK2                                                 MDG15490
 000FE6I  4130 8798 =001782I   1550            BAL   R3,LODAD         PERFORM TESTS IN THE ROUTINE        MDG15500
 000FEAI  48D0 8EEA =001ED8I   1551            LH    RD,OUTDEV        GET DEVICE INDICATOR                MDG15510
 000FEEI  C5D0 0003            1552            CLHI  RD,X'03'         DISC ?                              MDG15520
 000FF2I  4380 8046 =00103CI   1553            BNL   CREDIS           YES                                 MDG15530
 000FF6I  4130 8788 =001782I   1554            BAL   R3,LODAD                                             MDG15540
 000FFAI  9DA1                 1555            SSR   RA,R1                                                MDG15550
 000FFCI  C310 0020            1556            THI   R1,X'20'                                             MDG15560
 001000I  2335                 1557            BZS   WRTPDB                                               MDG15570
 001002I  C810 00E0            1558            LHI   R1,X'E0'         ERROR ILLEGAL BOT OR EOT            MDG15580
 001006I  4300 8CCA =001CD4I   1559            B     ERRA             AT THE START OF AN OPERATION        MDG15590
          0000 100AI           1560  WRTPDB    EQU   *                                                    MDG15600
 00100AI  2441                 1561            LIS   R4,1             SET THE EOJ                         MDG15610
 00100CI  4040 91FA =00220AI   1562            STH   R4,EOJFLG        FLAG                                MDG15620
 001010I  E650 8F54 =001F68I   1563            LDAI  R5,PDB                                               MDG15630
 001014I  E660 8F83 =001F9BI   1564            LDAI  R6,PDB+51        *                          R04      MDG15640
 001018I  4130 8520 =00153CI   1565            BAL   R3,WRTPR                                             MDG15650
 00101CI  58D0 8EAC =001ECCI   1566            LDA   RD,LOW                                               MDG15660
 001020I  58E0 8EAC =001ED0I   1567            LDA   RE,HIGH                                              MDG15670
 001024I  4130 884A =001872I   1568  WRT1Y     BAL   R3,STBKAD                                            MDG15680
 001028I  4130 8510 =00153CI   1569            BAL   R3,WRTPR                                             MDG15690
 00102CI  0844                 1570            LDAR  R4,R4                                                MDG15700
 00102EI  2235                 1571            BZS   WRT1Y                                                MDG15710
 001030I  4130 8990 =0019C4I   1572            BAL   R3,LOKOUT        LOCK THE OUTPUT DEVICE              MDG15720
 001034I  4130 8998 =0019D0I   1573            BAL   R3,ZSEQ                                              MDG15730
 001038I  4300 866C =0016A8I   1574            B     EOV                                                  MDG15740
          0000 103CI           1575  CREDIS    EQU   *                                                    MDG15750
 00103CI  2441                 1576            LIS   R4,1                                                 MDG15760
 00103EI  4040 91C8 =00220AI   1577            STH   R4,EOJFLG                                            MDG15770
 001042I  4130 833E =001384I   1578            BAL   R3,UPDTXX                                            MDG15780
 001046I  4130 8738 =001782I   1579            BAL   R3,LODAD                                             MDG15790
 00104AI  D330 EFFC =00004AI   1580            LB    R3,SOD           GET START                           MDG15800
 00104EI  4030 91AE =002200I   1581            STH   R3,CYL                                               MDG15810
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 001052I  0788                          XAR   R8,R8              SET SECTOR TO ZERO               MDG15820
 001054I  4130 8986 =0019DEI            BAL   R3,WDFT            SET UP FILE                      MDG15830
 001058I  DEA0 8853 =0018AFI            OC    RA,SEEK            SEEK                             MDG15840
 00105CI  4130 89B0 =001A10I            BAL   R3,FRSRW           WAIT                             MDG15850
 001060I  2430                          LIS   R3,0               ZERO                             MDG15860
 001062I  4030 919C =002202I            STH   R3,HEAD            OUT HEAD                         MDG15870
 001066I  E650 9042 =0020ACI            LDAI  R5,DIRECT          SET UP ADDRESSES                 MDG15880
 00106AI  0865                          LDAR  R6,R5              FOR THE SELCH                    MDG15890
*00106CI  CA60 00FF                     AAI   R6,X'FF'                                            MDG15900
 001070I  4130 896A =0019DEI            BAL   R3,WDFT                                             MDG15910
 001074I  4130 84A2 =00151AI            BAL   R3,RDISC           GO READ THE DISC                 MDG15920
 001078I  C830 EEEE                     LHI   R3,X'EEEE'         SEE IF THE DISC WAS INITIALIZED ? MDG15930
 00107CI  4530 902C =0020ACI            CLH   R3,DIRECT                                           MDG15940
 001080I  2335                          BES   CREA4                                               MDG15950
 001082I  C810 00E0                     LHI   R1,X'E0'                                            MDG15960
 001086I  4300 8C4A =001CD4I            B     ERRA                                                MDG15970
 00108AI  0722                  CREA4   XAR   R2,R2                                               MDG15980
 00108CI  D332 901E =0020AEI    CREA6   LB    R3,DIRECT+2(R2)                                     MDG15990
 001090I  C530 0000                     CLHI  R3,X'00'           DIRECTORY                        MDG16000
 001094I  4330 805C =0010F4I            BE    AVAIL              FOR AN                           MDG16010
 001098I  D350 8ECE =001F6AI            LB    R5,SEQNAM+2        GET THE THIRD DIGIT              MDG16020
 00109CI  0553                          CLAR  R5,R3              EQUAL ?                          MDG16030
 00109EI  2138                          BNES  CREAXY             NO                               MDG16040
 0010A0I  4832 9008 =0020ACI            LH    R3,DIRECT(R2)      GET THE FIRST TWO DIGITS         MDG16050
 0010A4I  4850 8EC0 =001F68I            LH    R5,SEQNAM                                           MDG16060
 0010A8I  0553                          CLAR  R5,R3              EQUAL ?                          MDG16070
 0010AAI  4330 81B8 =001266I            BE    NUMTHERE                                            MDG16080
          0000 10AEI            CREAXY  EQU   *                                                   MDG16090
 0010AEI  2628                          AIS   R2,8               EMPTY BLOCK                      MDG16100
 0010B0I  C520 0100                     CLHI  R2,X'100'          REACH THE END ?                  MDG16110
 0010B4I  4230 FFD4 =00108CI            BNE   CREA6              NO                               MDG16120
 0010B8I  2681                  NXTDIR  AIS   R8,1               INCREMENT SECTOR                 MDG16130
 0010BAI  4830 9150 =00220EI            LH    R3,CUTRKDEN        LOAD                             MDG16140
 0010BEI  4583 F4A2 =000564I            CLH   R8,SECTAB(R3)      MORE SECTORS THIS TRACK ?        MDG16150
*0010C2I  233D                          BE    NXDRHD             NO                               MDG16160
 0010C4I  E650 8FE4 =0020ACI    NXREA1  LDAI  R5,DIRECT          YES                              MDG16170
 0010C8I  0865                          LDAR  R6,R5              SET UP FOR READ                  MDG16180
*0010CAI  CA60 00FF                     AAI   R6,X'FF'                                            MDG16190
 0010CEI  4130 890C =0019DEI            BAL   R3,WDFT                                             MDG16200
 0010D2I  4130 8444 =00151AI            BAL   R3,RDISC           GO READ THE DISC                 MDG16210
 0010D6I  2420                  NXDR1   LIS   R2,0                                                MDG16220
 0010D8I  4300 FFB0 =00108CI            B     CREA6              SEARCH                           MDG16230
                                *                                                                 MDG16240
 0010DCI  4820 9122 =002202I    NXDRHD  LH    R2,HEAD            HEAD                             MDG16250
 0010E0I  4523 F48E =000572I            CLH   R2,HDTAB(R3)       MAXIMUM?                         MDG16260
 0010E4I  4330 8B9C =001C84I            BE    DIRFUL             YES - DIRECTORY FULL             MDG16270
 0010E8I  2621                          AIS   R2,1               NO SET HEAD =+1                  MDG16280
 0010EAI  4020 9114 =002202I            STH   R2,HEAD            STORE                            MDG16290
 0010EEI  0788                          XAR   R8,R8              SET SECTOR TO ZERO               MDG16300
 0010F0I  4300 FFD0 =0010C4I            B     NXREA1             GO READ                          MDG16310
 0010F4I  4830 910A =002202I    AVAIL   LH    R3,HEAD                                             MDG16320
 0010F8I  4030 8FA0 =00209CI            STH   R3,DIRPRM          SAVE DIRECTORY INFO.             MDG16330
 0010FCI  4080 8F9E =00209EI            STH   R8,DIRPRM+2                                         MDG16340
 001100I  4882 8FAC =0020B0I            LH    R8,DIRECT+4(R2)    GET THE CYL # FROM THE DIRECTORY MDG16350
 001104I  4080 90F8 =002200I            STH   R8,CYL                                              MDG16360
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001108I D382 8FA7 =0020B3I 1637          LB    R8,DIRECT+7(R2)     GET THE HEAD # FROM THE DIRECTORY      MDG16370
00110CI 4080 90F2 =002202I 1638          STH   R8,HEAD                                                MDG16380
001110I D382 8F9E =0020B2I 1639          LB    R8,DIRECT+6(R2)     GET THE SECTOR # FROM THE DIRECTORY    MDG16390
001114I 4020 8F88 =0020A0I 1640          STH   R2,DIRPRM+4                                            MDG16400
001118I E650 8E4C =001F68I 1641          LDAI  R5,PDB              SET UP TO WRITE THE PDB              MDG16410
00111CI E660 8E7B =001F9BI 1642          LDAI  R6,PDB+51           TO THE DISK                  R04     MDG16420
001120I 4130 8152 =001276I 1643          BAL   R3,AVAIL0                                              MDG16430
001124I 5830 90AC =0021D4I 1644          LDA   R3,CPYFLG           GET THE COPY FLAG - SET ?            MDG16440
001128I 0233               1645          BNZR  R3                  YES - COPY RETURN                    MDG16450
00112AI 58D0 8D9E =001ECCI 1646          LDA   RD,LOW              LOAD START ADDRESS                   MDG16460
00112EI 58E0 8D9E =001ED0I 1647          LDA   RE,HIGH             LOAD END ADDRESS                     MDG16470
001132I 4130 873C =001872I 1648 DTRIP    BAL   R3,STBKAD           GET BLOCK ADDRESSES                  MDG16480
001136I 4040 90D6 =002210I 1649          STH   R4,CUMAXCYL                                            MDG16490
00113AI 4130 8138 =001276I 1650          BAL   R3,AVAIL0           WRITE                                MDG16500
00113EI 4840 90CE =002210I 1651          LH    R4,CUMAXCYL                                            MDG16510
001142I 2238               1652          BZS   DTRIP                                                  MDG16520
001144I 4130 8010 =001158I 1653          BAL   R3,DTRDON                                              MDG16530
001148I 4130 8884 =0019D0I 1654          BAL   R3,ZSEQ                                                MDG16540
00114CI 4300 8570 =0016C0I 1655          B     PEOJ                                                   MDG16550
001150I C800 4432          1656 CREAER   LHI   R0,C'D2'                                               MDG16560
001154I 4300 8AB8 =001C10I 1657          B     ERROR                                                  MDG16570
                           1658 *    AT THIS TIME THE DIRECTORY MUST BE UPDATED                       MDG16580
                           1659 *       1. THE SEQUENCE NUMBER MUST BE STORED IN THE DIRECTORY        MDG16590
                           1660 *                                                                     MDG16600
                           1661 *       2. THE CURRENT SECTOR, HEAD AND CYLINDER MUST BE STORED IN    MDG16610
                           1662 *          THE NEXT BLOCK.                                            MDG16620
     0000 1158I            1663 DTRDON   EQU   *                                                      MDG16630
001158I 5030 907C =0021D8I 1664          STA   R3,DTDONE           SAVE THE ADDRESS                     MDG16640
00115CI 4130 8864 =0019C4I 1665          BAL   R3,LOKOUT           LOCK THE OUTPUT DEVICE               MDG16650
001160I 4830 909C =002200I 1666          LH    R3,CYL              SAVE THE CURRENT                     MDG16660
001164I 4030 8F3C =0020A4I 1667          STH   R3,NXTPRM           CYLINDER                             MDG16670
001168I 4830 9096 =002202I 1668          LH    R3,HEAD             HEAD                                 MDG16680
00116CI 4030 8F36 =0020A6I 1669          STH   R3,NXTPRM+2                                            MDG16690
001170I 4080 8F34 =0020A8I 1670          STH   R8,NXTPRM+4         SECTOR                               MDG16700
001174I 4830 8F24 =00209CI 1671          LH    R3,DIRPRM           RETRIEVE THE DIRECTROY PARAMETERS    MDG16710
001178I 4030 9086 =002202I 1672          STH   R3,HEAD             HEAD                                 MDG16720
00117CI 4880 8F1E =00209EI 1673          LH    R8,DIRPRM+2         SECTOR                               MDG16730
001180I D320 EEC6 =00004AI 1674          LB    R2,SOD              GET START                            MDG16740
001184I 4020 9078 =002200I 1675          STH   R2,CYL              CYLINDER                             MDG16750
001188I 4820 8F14 =0020A0I 1676          LH    R2,DIRPRM+4         DIRECTORY INCREMENT                  MDG16760
00118CI 0842               1677          LDAR  R4,R2               COPY INCREMENT                       MDG16770
00118EI D330 8DD6 =001F68I 1678          LB    R3,SEQNAM                                              MDG16780
001192I D234 8F16 =0020ACI 1679          STB   R3,DIRECT(R4)       STORE THE                            MDG16790
001196I 2641               1680          AIS   R4,1                SEQUENCE                             MDG16800
001198I D330 8DCD =001F69I 1681          LB    R3,SEQNAM+1         NUMBER                               MDG16810
00119CI D234 8F0C =0020ACI 1682          STB   R3,DIRECT(R4)       IN THE DIRECTORY                     MDG16820
0011A0I 2641               1683          AIS   R4,1                                                   MDG16830
0011A2I D330 8DC4 =001F6AI 1684          LB    R3,SEQNAM+2                                            MDG16840
0011A6I D234 8F02 =0020ACI 1685          STB   R3,DIRECT(R4)                                          MDG16850
0011AAI 2628               1686 UPDTDR   AIS   R2,8                NO - BUMP POINTER TO NEXT BLOCK      MDG16860
0011ACI C520 0100          1687          CLHI  R2,X'100'           > 100                                MDG16870
0011B0I 4330 8040 =0011F4I 1688          BE    NEEDNW              YES - NEED ANOTHER SECTOR            MDG16880
0011B4I 4840 8EEC =0020A4I 1689          LH    R4,NXTPRM           NO                                   MDG16890
0011B8I 4042 8EF4 =0020B0I 1690          STH   R4,DIRECT+4(R2)     STORE NEXT AVAIL. SECTOR             MDG16900
0011BCI 4840 8EE8 =0020A8I 1691          LH    R4,NXTPRM+4                                            MDG16910
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0011C0I  D242 8EEE =0020B2I   1692           STB   R4,DIRECT+6(R2)                                    MDG16920
0011C4I  4840 8EDE =0020A6I   1693           LH    R4,NXTPRM+2                                       MDG16930
0011C8I  D242 8EE7 =0020B3I   1694           STB   R4,DIRECT+7(R2)                                   MDG16940
         0000 11CCI           1695  STORDR   EQU   *                                                 MDG16950
0011CCI  4130 8840 =001A10I   1696           BAL   R3,FRSRW                                          MDG16960
0011D0I  4130 880A =0019DEI   1697           BAL   R3,WDFT                                           MDG16970
0011D4I  DEA0 86D7 =0018AFI   1698           OC    RA,SEEK                                           MDG16980
0011D8I  4130 8834 =001A10I   1699           BAL   R3,FRSRW                                          MDG16990
0011DCI  E650 8ECC =0020ACI   1700           LDAI  R5,DIRECT                                         MDG17000
0011E0I  0865                 1701           LDAR  R6,R5                                             MDG17010
*0011E2I CA60 00FF            1702           AAI   R6,X'FF'                                          MDG17020
0011E6I  4130 87F4 =0019DEI   1703           BAL   R3,WDFT                                           MDG17030
0011EAI  4130 8332 =00152CI   1704           BAL   R3,WDISC                                          MDG17040
0011EEI  5830 8FE6 =0021D8I   1705           LDA   R3,DTDONE          GET ADDRESS                    MDG17050
0011F2I  0303                 1706           BR    R3                 RETURN                         MDG17060
         0000 11F4I           1707  NEEDNW   EQU   *                                                 MDG17070
0011F4I  4130 8818 =001A10I   1708           BAL   R3,FRSRW                                          MDG17080
0011F8I  4130 87E2 =0019DEI   1709           BAL   R3,WDFT                                           MDG17090
0011FCI  DEA0 86AF =0018AFI   1710           OC    RA,SEEK                                           MDG17100
001200I  4130 880C =001A10I   1711           BAL   R3,FRSRW                                          MDG17110
001204I  E650 8EA4 =0020ACI   1712           LDAI  R5,DIRECT          WRITE                          MDG17120
001208I  0865                 1713           LDAR  R6,R5              DIRECTORY                      MDG17130
*00120AI CA60 00FF            1714           AAI   R6,X'FF'           TO THE DISC                    MDG17140
00120EI  4130 87CC =0019DEI   1715           BAL   R3,WDFT                                           MDG17150
001212I  4130 830A =001520I   1716           BAL   R3,WDISC                                          MDG17160
                              1717  *  GET NEXT SECTOR OF DIRECTORY AND LINK IT                      MDG17170
001216I  2681                 1718           AIS   R8,1               INCREMENT SECTOR               MDG17180
001218I  4830 8FF2 =00220EI   1719           LH    R3,CUTRKDEN        LOAD                           MDG17190
00121CI  4583 F344 =000564I   1720           CLH   R8,SECTAB(R3)      ANY SECTORS LEFT               MDG17200
*001220I 233D                 1721           BE    NEDNW1             NO                             MDG17210
001222I  E650 8E86 =0020ACI   1722           LDAI  R5,DIRECT                                         MDG17220
001226I  0865                 1723           LDAR  R6,R5                                             MDG17230
*001228I CA60 00FF            1724           AAI   R6,X'FF'                                          MDG17240
00122CI  4130 87AE =0019DEI   1725           BAL   R3,WDFT                                           MDG17250
001230I  4130 82E6 =00151AI   1726           BAL   R3,RDISC           READ DISC                      MDG17260
001234I  2528                 1727           LCS   R2,8                                              MDG17270
001236I  4300 FF70 =0011AAI   1728           B     UPDTDR                                            MDG17280
00123AI  4820 8FC4 =022202I   1729  NEDNW1   LH    R2,HEAD                                           MDG17290
00123EI  4523 F330 =000572I   1730           CLH   R2,HDTAB(R3)       MAXIMUM?                       MDG17300
001242I  4330 847A =0016C0I   1731           BE    PEOJ                                              MDG17310
001246I  2621                 1732           AIS   R2,1                                              MDG17320
001248I  4020 8FB6 =022202I   1733           STH   R2,HEAD                                           MDG17330
00124CI  0788                 1734           XAR   R8,R8                                             MDG17340
00124EI  E650 8E5A =0020ACI   1735           LDAI  R5,DIRECT                                         MDG17350
001252I  0865                 1736           LDAR  R6,R5                                             MDG17360
*001254I CA60 00FF            1737           AAI   R6,X'FF'                                          MDG17370
001258I  4130 8782 =0019DEI   1738           BAL   R3,WDFT                                           MDG17380
00125CI  4130 82BA =00151AI   1739           BAL   R3,RDISC           READ DISC                      MDG17390
001260I  2528                 1740           LCS   R2,8                                              MDG17400
001262I  4300 FF44 =0011AAI   1741           B     UPDTDR                                            MDG17410
001266I  C800 4434            1742  NUMTHERE LHI   R0,C'D4'                                         MDG17420
00126AI  4300 89A2 =001C10I   1743           B     ERROR                                             MDG17430
                              1744  ********************************************************************* MDG17440
                              1745  *                                                                   * MDG17450
                              1746  *                                                                   * MDG17460
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                                1747  *  A V A I L R                                                    *   MDG17470
                                1748  *                                                                 *   MDG17480
                                1749  *  A V A I L W   - - (AVAIL0)                                     *   MDG17490
                                1750  *                                                                 *   MDG17500
                                1751  *   THIS ROUTINE WILL READ OR WRITE A PROGRAM BLOCK FROM THE       *   MDG17510
                                1752  *   DISC AND WILL RETURN WITH SECTOR-HEAD-CYLINDER UPDATED TO THE  *   MDG17520
                                1753  *   NEXT SECTOR.                                                  *   MDG17530
                                1754  *                                                                 *   MDG17540
                                1755  *       INPUT - R3 = RETURN ADDRESS                               *   MDG17550
                                1756  *               R8 = SECTOR TO BE READ                            *   MDG17560
                                1757  *              CYL = CYLINDER TO BE READ                          *   MDG17570
                                1758  *             HEAD = HEAD TO BE READ                              *   MDG17580
                                1759  *               R5 = START ADDRESS OF THE BUFFER                  *   MDG17590
                                1760  *               R6 = END ADDRESS OF THE BUFFER                    *   MDG17600
                                1761  *                                                                 *   MDG17610
                                1762  *       OUTPUT: R5 = SAME                                         *   MDG17620
                                1763  *               R6 = SAME                                         *   MDG17630
                                1764  *               R8 = NEXT SECTOR                                  *   MDG17640
                                1765  *              CYL = NEXT CYL (IF NEEDED)                         *   MDG17650
                                1766  *             HEAD = NEXT HEAD (IF NEEDED)                        *   MDG17660
                                1767  *        IF A READ:= BUFFER AREA SPECIFIED BY R5 & R6 = DATA READ  *   MDG17670
                                1768  *                                                                 *   MDG17680
                                1769  ***********************************************************************   MDG17690
      0000 126EI                1770  AVAILR  EQU   *                                                       MDG17700
00126EI 242F                    1771          LIS   R2,15             INDICATE READ                       MDG17710
001270I 4020 8FAC =002220I      1772          STH   R2,AVAFLG                                             MDG17720
001274I 2304                    1773          BS    AVALL1                                                MDG17730
      0000 1276I                1774  AVAIL0  EQU   *                                                       MDG17740
      0000 1276I                1775  AVAILW  EQU   *                                                       MDG17750
001276I 2420                    1776          LIS   R2,0              INDICATE WRITE                      MDG17760
001278I 4020 8FA4 =002220I      1777          STH   R2,AVAFLG                                             MDG17770
      0000 127CI                1778  AVALL1  EQU   *                                                       MDG17780
00127CI 5030 8F64 =0021E4I      1779          STA   R3,AVARTN                                             MDG17790
001280I 4130 875A =0019DEI      1780  AVAIL5  BAL   R3,WDFT                                               MDG17800
001284I DEA0 8627 =0018AFI      1781          OC    RA,SEEK                                               MDG17810
001288I 4130 8784 =001A10I      1782          BAL   R3,FRSRW                                              MDG17820
00128CI 4840 8F7E =00220EI      1783          LH    R4,CUTRKDEN                                           MDG17830
001290I 4584 F2D0 =000564I      1784          CLH   R8,SECTAB(R4)     MAXIMUM ?                           MDG17840
*001294I 233F                   1785          BE    AVAIL4A           NO                                  MDG17850
001296I 4130 8744 =0019DEI      1786  AVAIL4  BAL   R3,WDFT                                               MDG17860
00129AI 4130 8798 =001A36I      1787          BAL   R3,RCHK           READ CHECK THE SECTOR               MDG17870
00129EI 4830 8F52 =0021F4I      1788          LH    R3,CONSTA         IS THIS SECTOR                      MDG17880
0012A2I C330 0020               1789          THI   R3,X'20'          DEFECTIVE                           MDG17890
0012A6I 4330 8042 =0012ECI      1790          BZ    AVAIL1            NO                                  MDG17900
0012AAI 2681                    1791          AIS   R8,1              NO - GET ANOTHER SECTOR             MDG17910
0012ACI 4584 F2B4 =000564I      1792          CLH   R8,SECTAB(R4)     ANY ON TH S TRACK ?                 MDG17920
0012B0I 203D                    1793          BNES  AVAIL4                                                MDG17930
0012B2I 4830 8F4C =022202I      1794  AVAIL4A LH    R3,HEAD           LOAD HEAD                           MDG17940
0012B6I 4534 F2B8 =000572I      1795          CLH   R3,HDTAB(R4)      MAXIMUM                             MDG17950
*0012BAI 2337                   1796          BE    AVAI00            NO                                  MDG17960
0012BCI 2631                    1797          AIS   R3,1              YES                                 MDG17970
0012BEI 4030 8F40 =022202I      1798          STH   R3,HEAD           INCREMENT HEAD                      MDG17980
0012C2I 0788                    1799          XAR   R8,R8             ZERO SECTOR                         MDG17990
0012C4I 4300 FFCE =001296I      1800          B     AVAIL4                                                MDG18000
0012C8I 4830 8F34 =022200I      1801  AVAI00  LH    R3,CYL            GET NEXT CYL #                      MDG18010
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                                              AIS   R3,1
0012CCI  2631
0012CEI  4534 F05C =00032EI                   CLH   R3,CYLTAB(R4)      VALID ?
0012D2I  2186                                 BLS   AVACON             YES
0012D4I  2335                                 BES   AVACON             YES
0012D6I  C810 00EC                            LHI   R1,X'EC'           NO - ERROR
0012DAI  4300 89F6 =001CD4I                   B     ERRA               PACK FULL
0012DEI  4030 8F1E =002200I         AVACON    STH   R3,CYL             SAVE NEW CYL VALUE
0012E2I  0788                                 XAR   R8,R8              ZERO SECTOR
0012E4I  4080 8F1A =002202I                   STH   R8,HEAD            ZERO OUT HEAD
0012E8I  4300 FF94 =001280I                   B     AVAIL5             GO SEEK
         0000 12ECI                 AVAIL1    EQU   *
0012ECI  4830 8F30 =002220I                   LH    R3,AVAFLG          READ OR WRITE ?
0012F0I  2336                                 BZS   AVAWRT             WRITE
0012F2I  4130 86E8 =0019DEI                   BAL   R3,WDFT
0012F6I  4130 8220 =00151AI                   BAL   R3,RDISC           READ
0012FAI  2305                                 BS    AVACTN             CONTINUE
0012FCI  4130 86DE =0019DEI         AVAWRT    BAL   R3,WDFT
001300I  4130 821C =001520I                   BAL   R3,WDISC
001304I  2681                       AVACTN    AIS   R8,1
001306I  4584 F25A =000564I                   CLH   R8,SECTAB(R4)      > MAX ?
00130AI  2333                                 BES   AVAIL6             YES
00130CI  4300 8036 =001346I                   B     AVAEND             NO - RETURN
001310I  4830 8EEE =002202I         AVAIL6    LH    R3,HEAD            INC. THE HEAD IF POSSIBLE
001314I  4534 F25A =000572I                   CLH   R3,HDTAB(R4)       MAXIMUM?
*001318I 2337                                 BE    AVANCY             NOT POSSIBLE
00131AI  2631                                 AIS   R3,1               SET THE HEAD
00131CI  4030 8EE2 =002202I                   STH   R3,HEAD            TO 1
001320I  0788                                 XAR   R8,R8              SET SECTOR TO ZERO
001322I  4300 8020 =001346I                   B     AVAEND
001326I  4830 8ED6 =002200I         AVANCY    LH    R3,CYL             GET THE CYLINDER VALUE
00132AI  2631                                 AIS   R3,1
00132CI  4534 EFFE =00032EI                   CLH   R3,CYLTAB(R4)      VALID ?
001330I  2186                                 BLS   AVACY1
001332I  2335                                 BES   AVACY1
001334I  C810 00EC                            LHI   R1,X'EC'           PACK FULL
001338I  4300 8998 =001CD4I                   B     ERRA
00133CI  4030 8EC0 =002200I         AVACY1    STH   R3,CYL             SAVE THE NEW CYLINDER
001340I  0788                                 XAR   R8,R8              ZERO OUT THE SECTOR
001342I  4080 8EBC =002202I                   STH   R8,HEAD            ZERO OUT THE HEAD
001346I  5830 8E9A =0021E4I         AVAEND    LDA   R3,AVARTN          GET THE RETURN ADDRESS
00134AI  0303                                 BR    R3
                                    ***********************************************************************
                                    *                                                                     *
                                    *  U P D T P T                                                        *
                                    *                                                                     *
                                    *                                                                     *
                                    *     THIS ROUTINE WILL RETURN THE DISC PARAMETERS(CYL- HEAD -SECTOR) *
                                    *     FOR THE PROGRAM NUMBER IN THE INDEV LOCK WORD.                  *
                                    *                                                                     *
                                    *         INPUT: R3=RETURN ADDRESS                                    *
                                    *                                                                     *
                                    *         OUTPUT: LOCATION "DCOPY" = SECTOR                           *
                                    *                          "DCOPY+2" = HEAD                           *
                                    *                          "DCOPY+4" = CYL                            *
                                    *
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                                  ************************************************************************
          0000 134CI              UPDTPT   EQU   *
00134CI   5030 8E80 =0021D0I               STA   R3,UPDTRN            SAVE RETURN
001350I   4130 84A6 =0017FAI               BAL   R3,LIDAD             LOAD INPUT ADDRESSES
001354I   4820 8B94 =001EECI               LH    R2,PGMIPN
001358I   C520 FFFF                        CLHI  R2,X'FFFF'           IS IT LOCKED ?
00135CI   2135                             BNES  UPPT1                NO
00135EI   C810 00EB                        LHI   R1,X'EB'             YES - ERROR
001362I   4300 896E =001CD4I               B     ERRA
          0000 1366I              UPPT1    EQU   *
001366I   243F                             LIS   R3,15                SET THE UPDATE FLAG
001368I   4030 8E82 =00221EI               STH   R3,UPDFLG
00136CI   4830 8B7C =001EECI               LH    R3,PGMIPN
001370I   4030 8E7C =0021F0I               STH   R3,PGMUPN
001374I   D330 8B76 =001EEEI               LB    R3,PGMIPN+2
001378I   D230 8E76 =0021F2I               STB   R3,PGMUPN+2
00137CI   4840 8E46 =0021C6I               LH    R4,TRKDFN+2
001380I   4300 802C =0013B0I               B     UPDCOM               BRANCH TO COMMON
                                  ************************************************************************
                                  *                                                                      *
                                  *  U P D T X X                                                         *
                                  *                                                                      *
                                  *     THIS ROUTINE WILL UPDATE THE DISC DIRECTORY AS FOLLOWS:          *
                                  *     THE ENTIRE DIRECTORY FROM THE OUTDEV LOCK WORD VALUE             *
                                  *     IS ZEROED OUT. USED FOR WRITE EOV AND WHEN COPY OR CREATE        *
                                  *     IS PERFORMED FROM OTHER THAN EOV.                                *
                                  *                                                                      *
                                  *       INPUT: R3 = RETURN ADDRESS                                     *
                                  *                                                                      *
                                  *       OUTPUT: NONE OTHER THAN THE UPDATED DIRECTORY.                 *
                                  *                                                                      *
                                  ************************************************************************
          0000 1384I              UPDTXX   EQU   *
001384I   5030 8E48 =0021D0I               STA   R3,UPDTRN            SAVE RETURN
001388I   4820 8B5C =001EE8I               LH    R2,PGMOPN            GET THE LOCK WORD
00138CI   C520 FFFF                        CLHI  R2,X'FFFF'           IS IT LOCKED ?
001390I   0333                             BER   R3                   YES - RETURN
001392I   4130 83EC =001782I               BAL   R3,LODAD             DIRECTORY
001396I   2430                             LIS   R3,0                 SET THE FF- BF FLAG
001398I   4030 8E82 =00221EI               STH   R3,UPDFLG
00139CI   4830 8B48 =001EE8I               LH    R3,PGMOPN
0013A0I   4030 8E4C =0021F0I               STH   R3,PGMUPN
0013A4I   D330 8B42 =001EEAI               LB    R3,PGMOPN+2
0013A8I   D230 8E46 =0021F2I               STB   R3,PGMUPN+2
0013ACI   4840 8E14 =0021C4I               LH    R4,TRKDFN
0013B0I   D330 EC96 =00004AI      UPDCOM   LB    R3,SOD               GET START
0013B4I   4030 8E48 =002200I               STH   R3,CYL               SET CYL TO START
0013B8I   2430                             LIS   R3,0                 CLEAR
0013BAI   4030 8E44 =002202I               STH   R3,HEAD              SET HEAD TO ZERO
0013BEI   0788                             XAR   R8,R8                SET SECTOR TO ZERO
0013C0I   4130 861A =0019DEI               BAL   R3,WDFT              SET UP FILE
0013C4I   DEA0 84E7 =0018AFI               OC    RA,SEEK              SEEK
0013C8I   4130 8644 =001A10I               BAL   R3,FRSRW             WAIT
0013CCI   E650 8CDC =0020ACI               LDAI  R5,DIRECT
0013D0I   0865                             LDAR  R6,R5
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*001302I CA60 00FF                        AAI   R6,X'FF'                                         MDG19120
 0013D6I 4130 8604 =0019DEI               BAL   R3,WDFT                                          MDG19130
 0013DAI 4130 813C =00151AI               BAL   R3,RDISC          GO READ                        MDG19140
 0013DEI C830 EEEE                        LHI   R3,X'EEEE'        IS THE FIRST BYTE              MDG19150
 0013E2I 4530 8CC6 =0020ACI               CLH   R3,DIRECT         X'EEEE' ?                      MDG19160
 0013E6I 2335                             BES   UPDTX1            YES OK                         MDG19170
 0013E8I C810 00E0                        LHI   R1,X'E0'          NO                             MDG19180
 0013ECI 4300 88E4 =001CD4I               B     ERRA                                             MDG19190
 0013F0I 0722                     UPDTX1  XAR   R2,R2                                            MDG19200
 0013F2I 4832 8CB6 =0020ACI       UPDTX3  LH    R3,DIRECT(R2)     GET THE NUMBER FROM THE DIRECTORY MDG19210
 0013F6I 4530 8DF6 =0021F0I               CLH   R3,PGMUPN                                        MDG19220
 0013FAI 2138                             BNES  UPDTX2            NO                             MDG19230
 0013FCI D332 8CAE =0020AEI               LB    R3,DIRECT+2(R2)   YES - ARE THE THIRD DIGITS = ? MDG19240
 001400I D310 8DEE =0021F2I               LB    R1,PGMUPN+2                                      MDG19250
 001404I 0531                             CLAR  R3,R1                                            MDG19260
 001406I 4330 8044 =00144EI               BE    UPFIND            YES  MATCH                     MDG19270
 00140AI 2628                     UPDTX2  AIS   R2,8              BUMP POINTER                   MDG19280
 00140CI C520 0100                        CLHI  R2,X'100'         MAX ?                          MDG19290
 001410I 203F                             BNES  UPDTX3            NO                             MDG19300
 001412I 2681                             AIS   R8,1              YES - BUMP SECTOR              MDG19310
 001414I 4584 F14C =000564I               CLH   R8,SECTAB(R4)     MAXIMUM?                       MDG19320
*001418I 233C                             BE    UPDTX4            NO                             MDG19330
 00141AI E650 8C8E =0020ACI       UPDTX5  LDAI  R5,DIRECT         YES                            MDG19340
 00141EI 0865                             LDAR  R6,R5                                            MDG19350
*001420I CA60 00FF                        AAI   R6,X'FF'                                         MDG19360
 001424I 4130 85B6 =0019DEI               BAL   R3,WDFT                                          MDG19370
 001428I 4130 80EE =00151AI               BAL   R3,RDISC          READ NEXT DIRECTORY            MDG19380
 00142CI 4300 FFC0 =0013F0I               B     UPDTX1                                           MDG19390
 001430I 4820 8DCE =002202I       UPDTX4  LH    R2,HEAD                                          MDG19400
 001434I 4524 F13A =000572I               CLH   R2,HDTAB(R4)      MAXIMUM?                       MDG19410
*001438I 2337                             BE    UPDTXM            NO - MATCH                     MDG19420
 00143AI 2621                             AIS   R2,1                                             MDG19430
 00143CI 4020 8DC2 =002202I               STH   R2,HEAD           SET HEAD TO +1                 MDG19440
 001440I 0788                             XAR   R8,R8             ZERO SECTOR                    MDG19450
 001442I 4300 FFD4 =00141AI               B     UPDTX5                                           MDG19460
         0000 1446I               UPDTXM  EQU   *                 NO MATCH                       MDG19470
 001446I C810 00EB                        LHI   R1,X'EB'                                         MDG19480
 00144AI 4300 8886 =001CD4I               B     ERRA                                             MDG19490
         0000 144EI               UPFIND  EQU   *                                                MDG19500
 00144EI 4810 8DCC =00221EI               LH    R1,UPDFLG         GET FF/BF - UPDATE FLAG        MDG19510
 001452I 4230 8062 =0014B8I               BNZ   UPDTP1                                           MDG19520
 001456I 2410                             LIS   R1,0                                             MDG19530
 001458I 4012 8C50 =0020ACI               STH   R1,DIRECT(R2)     ZERO OUT NUMBER BUT LEAVE      MDG19540
 00145CI D212 8C4E =0020AEI               STB   R1,DIRECT+2(R2)   SECTOR POINTER                 MDG19550
 001460I 2628                             AIS   R2,8                                             MDG19560
 001462I C520 0100                UPFIN1  CLHI  R2,X'100'                                        MDG19570
 001466I 2335                             BES   UPXWB1                                           MDG19580
 001468I D212 8C40 =0020ACI               STB   R1,DIRECT(R2)     ZERO ALL REMAINING DIRECTORYS  MDG19590
 00146CI 2621                             AIS   R2,1                                             MDG19600
 00146EI 2206                             BS    UPFIN1                                           MDG19610
 001470I E650 8C38 =0020ACI       UPXWB1  LDAI  R5,DIRECT                                        MDG19620
 001474I 0865                             LDAR  R6,R5             STORE THE DIRECTORY BACK ON    MDG19630
*001476I CA60 00FF                        AAI   R6,X'FF'          THE PACK.                      MDG19640
 00147AI 4130 8560 =0019DEI               BAL   R3,WDFT                                          MDG19650
 00147EI 4130 809E =001520I               BAL   R3,WDISC                                         MDG19660
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001482I  2420                          LIS   R2,0                ARE THERE MORE SECTORS TO     MDG19670
001484I  2410                          LIS   R1,0                ZERO OUT.                     MDG19680
001486I  D212 8C22 =0020ACI   UPFIZF   STB   R1,DIRECT(R2)                                     MDG19690
00148AI  2621                          AIS   R2,1                                              MDG19700
00148CI  C520 0100                     CLHI  R2,X'100'                                         MDG19710
001490I  2035                          BNES  UPFIZF                                            MDG19720
001492I  2681                          AIS   R8,1                DIRECTORY IS FULL OF ZEROES   MDG19730
001494I  4584 F0CC =000564I            CLH   R8,SECTAB(R4)       MAXIMUM?                      MDG19740
001498I  4230 FFD4 =001470I            BNE   UPXWB1              NO                            MDG19750
00149CI  4830 8D62 =002202I            LH    R3,HEAD             ALL SECTORS ARE ZERO          MDG19760
0014A0I  4534 F0CE =000572I            CLH   R3,HDTAB(R4)        MAXIMUM?                      MDG19770
*0014A4I 2337                          BE    UPFIEN              YES                           MDG19780
0014A6I  2631                          AIS   R3,1                NO                            MDG19790
0014A8I  4030 8D56 =002202I            STH   R3,HEAD             DO NEXT HEAD                  MDG19800
0014ACI  0788                          XAR   R8,R8                                             MDG19810
0014AEI  4300 FFBE =001470I            B     UPXWB1                                            MDG19820
0014B2I  5830 8D1A =0021D0I   UPFIEN   LDA   R3,UPDTRN                                         MDG19830
0014B6I  0303                          BR    R3                                                MDG19840
         0000 14B8I           UPDTP1   EQU   *                                                 MDG19850
0014B8I  4080 8CF0 =0021ACI            STH   R8,DCOPY            STORE SECTOR                  MDG19860
0014BCI  4880 8D42 =002202I            LH    R8,HEAD                                           MDG19870
0014C0I  4080 8CEA =0021AEI            STH   R8,DCOPY+2          STORE HEAD                    MDG19880
0014C4I  4880 8D38 =002200I            LH    R8,CYL                                            MDG19890
0014C8I  4080 8CE4 =0021B0I            STH   R8,DCOPY+4          STORE CYL                     MDG19900
0014CCI  4020 8CE2 =0021B2I            STH   R2,DCOPY+6          STORE POINTER                 MDG19910
0014D0I  220F                          BS    UPFIEN              RETURN                        MDG19920
                              * THIS ROUTINE WILL COVERT THE ADDRESS IN DCOPY TO THE           MDG19930
                              *  ACTUAL LOCATION ON THE DISC OF THE PROGRAM                    MDG19940
         0000 14D2I           DIRPGM   EQU   *                                                 MDG19950
0014D2I  5030 8D12 =0021E8I            STA   R3,DIRPRN           SAVE RETURN                   MDG19960
0014D6I  4880 8CD2 =0021ACI            LH    R8,DCOPY            GET SECTOR                    MDG19970
0014DAI  4820 8CD0 =0021AEI            LH    R2,DCOPY+2                                        MDG19980
0014DEI  4020 8D20 =002202I            STH   R2,HEAD             GET HEAD                      MDG19990
0014E2I  4820 8CCA =0021B0I            LH    R2,DCOPY+4                                        MDG20000
0014E6I  4020 8D16 =002200I            STH   R2,CYL              GET CYL                       MDG20010
0014EAI  E650 8BBE =0020ACI            LDAI  R5,DIRECT                                         MDG20020
0014EEI  0865                          LDAR  R6,R5                                             MDG20030
*0014F0I CA60 00FF                     AAI   R6,X'FF'                                          MDG20040
0014F4I  4130 84E6 =0019DEI            BAL   R3,WDFT                                           MDG20050
0014F8I  4130 801E =00151AI            BAL   R3,RDISC            READ DIRECTORY                MDG20060
0014FCI  4820 8CB2 =0021B2I            LH    R2,DCOPY+6          GET POINTER                   MDG20070
001500I  4882 8BAC =0020B0I            LH    R8,DIRECT+4(R2)     GET CYL                       MDG20080
001504I  4080 8CF8 =002200I            STH   R8,CYL                                            MDG20090
001508I  D382 8BA7 =0020B3I            LB    R8,DIRECT+7(R2)     GET HEAD                      MDG20100
00150CI  4080 8CF2 =002202I            STH   R8,HEAD                                           MDG20110
001510I  D382 8B9E =0020B2I            LB    R8,DIRECT+6(R2)     GET SECTOR                    MDG20120
001514I  5830 8CD0 =0021E8I            LDA   R3,DIRPRN                                         MDG20130
001518I  0303                          BR    R3                  RETURN                        MDG20140
                              ****************************************************************** MDG20150
                              *                                                              * MDG20160
                              *  R E A D / W R I T E                                         * MDG20170
                              *   THIS IS THE COMMON READ / WRITE ROUTINE FOR ALL MAGNETIC MEDIA * MDG20180
                              *   READ/WRITE OPERATIONS. THE ROUTINE HAS 4 ENTRY POINTS. THE  * MDG20190
                              *   ENTRY POINTS ARE AS FOLLOWS:                               * MDG20200
                              *                                                              * MDG20210
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2022  *        ENTRY POINT          OPERATION                                  *   MDG20220
2023  *                                                                        *   MDG20230
2024  *        RDISC                THIS ENTRY  WILL READ DATA FROM THE        *   MDG20240
2025  *                             DISC.  THE INPUT PARAMETERS ARE:           *   MDG20250
2026  *                                                                        *   MDG20260
2027  *                                R3 = RETURN ADDRESS                     *   MDG20270
2028  *                                R5 = LOW ADDRESS OF READ BUFFER         *   MDG20280
2029  *                                R6 = HIGH ADDRESS OF READ BUFFER        *   MDG20290
2030  *                                RA = DISC ADDRESS                       *   MDG20300
2031  *                                RB = SELCH ADDRESS                      *   MDG20310
2032  *                                RC = CONTROLLER ADDRESS                 *   MDG20320
2033  *                                R8 = SECTOR TO BE READ                  *   MDG20330
2034  *                             "HEAD" = HEAD WHERE "R8" RESIDES           *   MDG20340
2035  *                             "CYL"  = CYLINDER WHERE "R8" RESIDES       *   MDG20350
2036  *                                                                        *   MDG20360
2037  *        WDISC                THIS ENTRY WILL WRITE DATA TO THE          *   MDG20370
2038  *                             DISC. THE INPUT PARAMETERS ARE:            *   MDG20380
2039  *                                                                        *   MDG20390
2040  *                                R3 = RETURN ADDRESS                     *   MDG20400
2041  *                                R5 = LOW ADDRESS OF WRITE BUFFER        *   MDG20410
2042  *                                R6 = HIGH ADDRESS OF WRITE BUFFER       *   MDG20420
2043  *                                RA = DISC ADDRESS                       *   MDG20430
2044  *                                RB = SELCH ADDRESS                      *   MDG20440
2045  *                                RC = CONTROLLER ADDRESS                 *   MDG20450
2046  *                                R8 = SECTOR TO BE WRITTEN               *   MDG20460
2047  *                             "HEAD" = HEAD WHERE "R8" RESIDES           *   MDG20470
2048  *                             "CYL"  = CYLINDER WHERE "R8" RESIDES       *   MDG20480
2049  *                                                                        *   MDG20490
2050  *                                R0 = WORK REGISTER                      *   MDG20500
2051  *                                R2 = WORK REGISTER                      *   MDG20510
2052  *                                                                        *   MDG20520
2053  *                                R0 = WORK REGISTER                      *   MDG20530
2054  *                                R2 = WORK REGISTER                      *   MDG20540
2055  *                                                                        *   MDG20550
2056  *        WRTPB                THIS ENTRY WILL WRITE A BLOCK OF DATA      *   MDG20560
2057  *                             TO MAG TAPE OR CASSETTE.  THE INPUT        *   MDG20570
2058  *                             PARAMETERS ARE:                            *   MDG20580
2059  *                                                                        *   MDG20590
2060  *                                R3 = RETURN ADDRESS                     *   MDG20600
2061  *                                R5 = LOW ADDRESS OF WRITE BUFFER        *   MDG20610
2062  *                                R6 = HIGH ADDRESS OF WRITE BUFFER       *   MDG20620
2063  *                                RA = DEVICE ADDRESS                     *   MDG20630
2064  *                                RB = SELCH ADDRESS (IF = 0 "WB" USED)   *   MDG20640
2065  *                                R0 = WORK REGISTER                      *   MDG20650
2066  *                                R1 = WORK REGISTER                      *   MDG20660
2067  *                                R2 = WORK REGISTER                      *   MDG20670
2068  *                                                                        *   MDG20680
2069  *        READPB               THIS ENTRY WILL READ A BLOCK OF DATA       *   MDG20690
2070  *                             FROM MAG TAPE OR CASSETTE.  THE INPUT      *   MDG20700
2071  *                             PARAMETERS ARE:                            *   MDG20710
2072  *                                                                        *   MDG20720
2073  *                                R3 = RETURN ADDRESS                     *   MDG20730
2074  *                                R5 = LOW ADDRESS OF READ BUFFER         *   MDG20740
2075  *                                R6 = HIGH ADDRESS OF READ BUFFER        *   MDG20750
2076  *                                RA = DEVICE ADDRESS                     *   MDG20760
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                            *                                RB = SELCH ADDRESS (IF = 0 "RB" USED)*   MDG20770
                            *                                R1 = RETURN ADDRESS IF A "FM" IS READ*   MDG20780
                            *                                R0 = WORK REGISTER                   *   MDG20790
                            *                                R2 = WORK REGISTER                   *   MDG20800
                            *                                                                     *   MDG20810
                            *                                                                     *   MDG20820
                            *                           OUTPUT  -  ALL THE ABOVE ROUTINE WILL     *   MDG20830
                            *                                      RETRY ON A RECOVERABLE ERROR   *   MDG20840
                            *                                      AND ABORT ON A NON-RECOVER-    *   MDG20850
                            *                                     ABLE ERROR. ALL REGISTER        *   MDG20860
                            *                                      VALUES ARE RETURNED AS THEY    *   MDG20870
                            *                                     ENTERED EXCEPT FOR REGISTERS    *   MDG20880
                            *                                      R0, R1, AND R2.  ON A          *   MDG20890
                            *                                      RETURN THE DESIGNATED AREA     *   MDG20900
                            *                                      SPECIFIED BY R5 AND R6 IS      *   MDG20910
                            *                                      GUARANTEED WRITTEN OR READ.    *   MDG20920
                            *                                                                     *   MDG20930
                            ***********************************************************************   MDG20940
                            *                                                                         MDG20950
                            *                                                                         MDG20960
00151AI  D320 8398 =0018B6I  RDISC    LB    R2,DREAD        GET THE READ COMMAND                      MDG20970
00151EI  2303                         BS    WRDSC1                                                    MDG20980
001520I  D320 838F =0018B3I  WDISC    LB    R2,DWRIT        LOAD THE WRITE COMMAND                    MDG20990
001524I  D220 8CDC =002204I  WRDSC1   STB   R2,DISCMD                                                 MDG21000
001528I  5030 8C90 =0021BCI           STA   R3,WRTEND                                                 MDG21010
00152CI  2435                         LIS   R3,5            SET THE RETRY COUNT                       MDG21020
00152EI  4030 8CDA =00220CI           STH   R3,RETRY                                                  MDG21030
001532I  243F                         LIS   R3,15           SET THE DISC INDICATOR                    MDG21040
001534I  4030 8CE4 =00221CI           STH   R3,RWDEV                                                  MDG21050
001538I  4300 8090 =0015CCI           B     DISC                                                      MDG21060
         0000 153CI          WRTPB    EQU   *                                                         MDG21070
00153CI  E610 811C =00165CI           LDAI  R1,MTERR        SET THE EOV BRANCH                        MDG21080
001540I  D320 8364 =0018A8I           LB    R2,MTWRT        GET THE WRITE COMMAMD                     MDG21090
001544I  2303                         BS    MTCOM                                                     MDG21100
001546I  D320 836D =0018B7I  READPB   LB    R2,MTREAD       GET THE READ COMMAND                      MDG21110
00154AI  D220 8CAA =0021F8I  MTCOM    STB   R2,MTCMD        STORE THE COMMAND                         MDG21120
00154EI  5030 8C6A =0021BCI           STA   R3,WRTEND                                                 MDG21130
001552I  5010 8C8A =0021E0I           STA   R1,EOVRTN       SAVE THE EOV BRANCH ADD.                  MDG21140
001556I  2415                         LIS   R1,5            SET THE WRITE RETRY COUNTER               MDG21150
001558I  4010 8CB0 =00220CI           STH   R1,RETRY        TO FIVE                                   MDG21160
00155CI  2430                         LIS   R3,0            SET THE MAG TAPE INDICATOR                MDG21170
00155EI  4030 8CBA =00221CI           STH   R3,RWDEV                                                  MDG21180
                            *                                                                         MDG21190
001562I  DEA0 8344 =0018AAI           OC    RA,DISABL                                                 MDG21200
                            *                                                                         MDG21210
001566I  08BB                MTRY     LDAR  RB,RB           SELCH ?                                   MDG21220
001568I  4230 8060 =0015CCI           BNZ   SELWRT          YES - BRANCH                              MDG21230
00156CI  2430                         LIS   R3,0            NO - USE WB                               MDG21240
00156EI  4030 8C96 =002208I           STH   R3,SELERR       ZERO OUT THE SELCH ERROR FLAG             MDG21250
001572I  D330 8C82 =0021F8I           LB    R3,MTCMD        GET THE COMMAND                           MDG21260
001576I  D320 833D =0018B7I           LB    R2,MTREAD       GET THE READ COMMAND                      MDG21270
00157AI  0523                         CLAR  R2,R3           IS THIS A READ ?                          MDG21280
00157CI  4330 8022 =0015A2I           BE    WBLKRD          YES                                       MDG21290
                            *                                                                         MDG21300
001580I  9EA3                         OCR   RA,R3           OUTPUT THE WRITE COMMAND                  MDG21310
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001582I  0815                             LDAR   R1,R5           SAVE R5                                  MDG21320
001584I  0826                             LDAR   R2,R6           SAVE R6                                  MDG21330
001586I  9DA0                    MTWB     SSR    RA,R0           SENSE STATUS                             MDG21340
001588I  2081                             BTBS   8,1             WAIT FOR BUSY NOT                        MDG21350
00158AI  DAA5 0000                        WD     RA,0(R5)        WRITE DATA                               MDG21360
00158EI  2651                             AIS    R5,1            BUMP                                     MDG21370
001590I  0565                             CLAR   R6,R5           DONE??                                   MDG21380
001592I  2286                             BNCS   MTWB            NO, LOOP                                 MDG21390
001594I  0851                             LDAR   R5,R1           RESTORE R5                               MDG21400
001596I  0862                             LDAR   R6,R2           RESTORE R6                               MDG21410
001598I  9DA0                             SSR    RA,R0           SENSE STATUS                             MDG21420
00159AI  4270 8024 =0015C2I               BTC    7,MTERRB        GO TO RETRY                              MDG21430
00159EI  4300 8076 =001618I               B      CONT5B                                                   MDG21440
0015A2I  9EA3                    WRLKRD   OCR    RA,R3           OUTPUT THE READ COMMAND                  MDG21450
0015A4I  0815                             LDAR   R1,R5           SAVE R5                                  MDG21460
0015A6I  0826                             LDAR   R2,R6           SAVE R6                                  MDG21470
0015A8I  9DA0                    MTRB     SSR    RA,R0           SENSE STATUS                             MDG21480
0015AAI  2081                             BTBS   8,1             WAIT FOR BUSY NOT                        MDG21490
0015ACI  DBA5 0000                        RD     RA,0(R5)        READ DATA                                MDG21500
0015B0I  2651                             AIS    R5,1            BUMP                                     MDG21510
0015B2I  0565                             CLAR   R6,R5           DONE??                                   MDG21520
0015B4I  2286                             BNCS   MTRB            NO, LOOP                                 MDG21530
0015B6I  0851                             LDAR   R5,R1           RESTORE R5                               MDG21540
0015B8I  0862                             LDAR   R6,R2           RESTORE R6                               MDG21550
0015BAI  9DA0                             SSR    RA,R0           SENSE STATUS                             MDG21560
0015BCI  2173                             BTFS   7,MTERRB        GO TO RETRY                              MDG21570
0015BEI  4300 8056 =001618I               B      CONT5B                                                   MDG21580
                                 *                                                                        MDG21590
0015C2I  241F                    MTERRB   LIS    R1,15                                                    MDG21600
0015C4I  4010 8C40 =002208I               STH    R1,SELERR                                                MDG21610
0015C8I  4300 804C =001618I               B      CONT5B                                                   MDG21620
                                 *                                                                        MDG21630
         0000 15CCI              DISC     EQU    *                                                        MDG21640
0015CCI  DEB0 82DC =0018ACI      SELWRT   OC     RB,STOP         STOP THE SELCH                           MDG21650
0015D0I                                   IFZ    ADC-4           *                               R04
0015D0I  3425                             EXHR   R2,R5           MS START ADDRESS DOWN           R04
0015D2I  3436                             EXHR   R3,R6           MS END ADDRESS DOWN             R04
0015D4I  9AB2                             WDR    RB,R2           WRITE THE FIRST BYTE                     MDL05910
                                          ENDC                   *                               R04
0015D6I  98B5                    CONT4B   WHR    RB,R5           WRITE THE 2ND + 3RD BYTES                MDG21790
0015D8I                                   IFZ    ADC-4           *                               R04
0015D8I  9AB3                             WDR    RB,R3           WRITE THE 4TH BYTE              R04      MDL05950
                                          ENDC                   *                               R04
0015DAI  98B6                    CONT4C   WHR    RB,R6           WRITE THE 5TH & 6TH BYTES                MDG21830
0015DCI  5050 8BFC =0021DCI               STA    R5,STADD        SAVE THE START ADDRESS.                  MDG21840
0015E0I  5060 8B04 =0021B8I               STA    R6,FADD                                                  MDG21850
                                 *                                                                        MDG21870
0015E4I  4820 8C34 =00221CI               LH     R2,RWDEV                                                 MDG21880
0015E8I  4230 80E4 =0016D0I               BNZ    SELDIS                                                   MDG21890
                                 *                                                                        MDG21900
0015ECI  D320 8C08 =0021F8I               LB     R2,MTCMD        GET THE MAG TAPE COMMAND                 MDG21910
0015F0I  D310 82C3 =0018B7I               LB     R1,MTREAD       GET MAG TAPE READ COMMAND                MDG21950
0015F4I  0512                             CLAR   R1,R2           IS THIS A MAG TAPE READ ?                MDG21960
0015F6I  2335                             BES    EMTRD           YES - GIVE ESELCH READ COMMAND           MDG21970
0015F8I  9EA2                             OCR    RA,R2           NO - GIVE MAGTPE WRITE COMMAND           MDG21980
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 0015FAI                           IFZ   ADC=4              *                              R04
 0015FAI  DEB0 82AB =0018A9I       OC    RB,ESWRT           ESELCH WRITE COMMAND      R04       MDL06060
                                   ELSE                     *                              R04
                                   OC    RB,SWRT            GIVE SELCH WRITE COMMAND  R04       MDL06100
                                   ENDC                     *                              R04
*0015FEI  2304                     B     SEL1                                                  MDG22000
 001600I  9EA2             EMTRD   OCR   RA,R2              GIVE THE MAGTPE READ COMMAND        MDG22010
 001602I                           IFZ   ADC=4              *                              R04
 001602I  DEB0 82B3 =0018B9I       OC    RB,ESREAD          GIVE THE ESELCH READ COMMAND        MDL06060
                                   ELSE                     *                              R04
                                   OC    RB,SREAD           GIVE SELCH READ COMMAND             MDL06100
                                   ENDC                     *                              R04
                           *                                                                   MDG22130
 001606I  4120 847E =001A88I SEL1  BAL   R2,SETSEL          SET UP FOR A SELCH INTERRUPT        MDG22140
 00160AI  C200 8002 =001610I       LPSW  CONT5A                                                MDG22150
                           *                                                                   MDG22160
 001610I                           ALIGN 8                                                     MDG22170
          0000 1610I       CONT5A  EQU   *                                                     MDG22180
 001610I                           IFNZ  ADC=2                                                 MDG22190
 001610I  0000                     DC    X'0000',X'F0F0'                                       MDG22200
 001612I  F0F0
 001614I  0000 1618I               DC    A(CONT5B)                                             MDG22210
                                   ELSE                                                        MDG22220
                                   DC    X'F000',Z(CONT5B)                                     MDG22230
                                   ENDC                                                        MDG22240
                           *                                                                   MDG22250
                           *                                                                   MDG22260
          0000 1618I       CONT5B  EQU   *                                                     MDG22270
 001618I  D320 8BDC =0021F8I       LB    R2,MTCMD           GET THE MT COMMAND                  MDG22280
 00161CI  D310 8297 =0018B7I       LB    R1,MTREAD          IS THIS A MT READ                   MDG22290
 001620I  0512                     CLAR  R1,R2                                                 MDG22300
*001622I  2339                     BE    CONMTX             YES - DONT CHECK FOR WRITE PROTECT  MDG22310
                           *                           NO - THE MT WRITE - CHECK TO SEE IF      MDG22320
 001624I  9DA1                     SSR   RA,R1              TAPE RESPONDED TO THE WRITE COMMAND MDG22330
 001626I  C310 0010                THI   R1,X'10'           NO MOTION SET ?                     MDG22340
 00162AI  2335                     BZS   CONMTX             NO - TAPE IS MOVING                 MDG22350
 00162CI  C810 00E9        NORUN   LHI   R1,X'E9'           YES - THEN TAPE DIDNT MOVE          MDG22360
 001630I  4300 86A0 =001CD4I       B     ERRA               PRINT ERROR                         MDG22370
                           *                                                                   MDG22380
          0000 1634I       CONMTX  EQU   *                                                     MDG22390
 001634I  9DA1             CONMT1  SSR   RA,R1              NO - THE MAGTAPE                    MDG22400
 001636I  4210 8634 =001C6EI       BTC   1,DEVDU            DEVICE IS DU                        MDG22410
 00163AI  C310 0010                THI   R1,X'10'           WAIT FOR NO MOTION                  MDG22420
 00163EI  2235                     BZS   CONMT1                                                MDG22430
 001640I  C310 0020                THI   R1,X'20'                                              MDG22440
 001644I  2335                     BZS   CONMT9                                                MDG22450
 001646I  C810 00D3                LHI   R1,X'D3'           END OF TAPE                         MDG22460
 00164AI  4300 8686 =001CD4I       B     ERRA                                                  MDG22470
          0000 164EI       CONMT9  EQU   *                                                     MDG22480
 00164EI  C310 00C0                THI   R1,X'C0'           ANY ERROR ?                         MDG22490
 001652I  2135                     BNZS  MTERR              YES - TRY TO RECOVER                MDG22500
 001654I  4830 8BB0 =002208I       LH    R3,SELERR          NO - SELCH ERROR ?                  MDG22510
 001658I  4330 8046 =0016A2I       BZ    MTEND                                                 MDG22520
                           *                                                                   MDG22530
          0000 165CI       MTERR   EQU   *                                                     MDG22540
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 00165CI  9DA1                    2241          SSR   RA,R1                                           MDG22550
 00165EI  C310 0010               2242          THI   R1,X'10'                                        MDG22560
 001662I  2233                    2243          BZS   MTERR                                           MDG22570
 001664I  D320 8B90 =0021F8I      2244          LB    R2,MTCMD              GET THE MAG TAPE COMMAND  MDG22580
 001668I  D330 824B =0018B7I      2245          LB    R3,MTREAD             GET THE READ CMD          MDG22590
 00166CI  0532                    2246          CLAR  R3,R2                 MT   READ ?               MDG22600
*00166EI  2138                    2247          BNE   MTERRW                NO - ERROR                MDG22610
 001670I  9DA1                    2248          SSR   RA,R1                 YES - CHECK FOR EOF.      MDG22620
 001672I  C310 0040               2249          THI   R1,X'40'              EOF ?                     MDG22630
 001676I  2334                    2250          BZS   MTERRW                NO                        MDG22640
 001678I  5830 8B64 =0021E0I      2251          LDA   R3,EOVRTN             YES - TAKE THE EOF RETURN MDG22650
 00167CI  0303                    2252          BR    R3                                              MDG22660
 00167EI  4830 8B8A =00220CI      2253 MTERRW   LH    R3,RETRY              TRY TO RECOVER            MDG22670
 001682I  2135                    2254          BNZS  MTERR1                                          MDG22680
 001684I  C810 00E3               2255          LHI   R1,X'E3'              RECOVERY UNSUCCESSFUL     MDG22690
 001688I  4300 8648 =001CD4I      2256          B     ERRA                                            MDG22700
 00168CI  2731                    2257 MTERR1   SIS   R3,1                                            MDG22710
 00168EI  4030 8B7A =00220CI      2258          STH   R3,RETRY                                        MDG22720
 001692I  4100 82EA =001980I      2259          BAL   R0,NOMOTN             WAIT FOR NO MOTION        MDG22730
 001696I  DEA0 8213 =0018ADI      2260          OC    RA,BKSP               BACKSPACE THE FILE        MDG22740
 00169AI  4100 82E2 =001980I      2261          BAL   R0,NOMOTN             WAIT FOR NO MOTION        MDG22750
 00169EI  4300 FEC4 =001566I      2262          B     MTRY                                            MDG22760
                                  2263 *                                                              MDG22770
          0000 16A2I              2264 MTEND    EQU   *                                               MDG22780
 0016A2I  5830 8B16 =0021BCI      2265          LDA   R3,WRTEND                                       MDG22790
 0016A6I  0303                    2266          BR    R3                                              MDG22800
                                  2267 *                                                              MDG22810
          0000 16A8I              2268 EOV      EQU   *                                               MDG22820
 0016A8I  DEA0 81FF =0018ABI      2269          OC    RA,WFM                WRITE A FILE MARK         MDG22830
 0016ACI  4100 82D0 =001980I      2270          BAL   R0,NOMOTN             WAIT FOR NO MOTION        MDG22840
 0016B0I  DEA0 81F7 =0018ABI      2271          OC    RA,WFM                                          MDG22850
 0016B4I  4100 82C8 =001980I      2272          BAL   R0,NOMOTN             WAIT FOR NO MOTION        MDG22860
 0016B8I  DEA0 81F1 =0018ADI      2273          OC    RA,BKSP                                         MDG22870
 0016BCI  4100 82C0 =001980I      2274          BAL   R0,NOMOTN             WAIT FOR NO MOTION        MDG22880
                                  2275 *                                                              MDG22890
 0016C0I  41E0 81F8 =0018BCI      2276 PEOJ     BAL   RE,CRLF               DO CR/LF                  MDG22900
 0016C4I  E620 80B4 =00177CI      2277          LDAI  R2,EOJ                                          MDG22910
 0016C8I  4130 81FA =0018C6I      2278          BAL   R3,PRINT                                        MDG22920
 0016CCI  4300 E9CC =00009CI      2279          B     REDTTY                                          MDG22930
                                  2280 *                                                              MDG22940
 0016D0I  9DC1                    2281 SELDIS   SSR   RC,R1                 WAIT                      MDG22950
 0016D2I  2221                    2282          BFBS  2,SELDIS              CONTROLLER IDLE           MDG22960
 0016D4I  4130 8306 =0019DEI      2283          BAL   R3,WDFT                                         MDG22970
 0016D8I  4830 8B32 =00220EI      2284          LH    R3,CUTRKDEN                                     MDG22980
 0016DCI  C530 0008               2285          CLHI  R3,8                                            MDG22990
*0016E0I  233C                    2286          BE    SELDIS2                                         MDG23000
 0016E2I  9AC8                    2287          WDR   RC,R8                 WRITE SECTOR              MDG23010
 0016E4I  4810 8B1A =002202I      2288          LH    R1,HEAD                                         MDG23020
 0016E8I  111A                    2289          SLLS  R1,10                 SCALE                     MDG23030
 0016EAI  4870 8B12 =002200I      2290          LH    R7,CYL                                          MDG23040
 0016EEI  0617                    2291          OAR   R1,R7                 MERGE CYL                 MDG23050
 0016F0I  98C1                    2292          WHR   RC,R1                 WRITE HEAD/CYL            MDG23060
 0016F2I  9DC7                    2293          SSR   RC,R7                                           MDG23070
 0016F4I  2221                    2294          BFBS  2,1                                             MDG23080
*0016F6I  2306                    2295          B     SELDIS1                                         MDG23090
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0016F8I  4810 8B06 =022002I  2296  SELDIS2  LH    R1,HEAD                                          MDG23100
0016FCI  1115                2297           SLLS  R1,5              POSITION THE HEAD BIT       MDG23110
0016FEI  0618                2298           OAR   R1,R8                                          MDG23120
001700I  9AC1                2299           WDR   RC,R1             SET UP THE HEADER           MDG23130
         0000 1702I          2300  SELDIS1  EQU   *                 *                  R04
001702I  D320 8AFE =002204I  2301           LB    R2,DISCMD         GET THE DISC COMMAND        MDG23150
001706I  D310 81AC =0018B6I  2302           LB    R1,DREAD          EXTENDED SELCH COMMANDS     MDG23180
00170AI  0512                2303           CLAR  R1,R2             IS THIS A DISC READ ?       MDG23190
00170CI  233A                2304           BES   ESRD              YES - GIVE ESELCH READ CMD  MDG23200
                             2305  *                                 NO - GIVE ESELCH WRITE CMD. MDG23210
00170EI  9DA1                2306           SSR   RA,R1                                          MDG23220
001710I  C310 0080           2307           THI   R1,X'80'          WRITE PROTECT SET ?         MDG23230
001714I  4230 805C =001774I  2308           BNZ   WRTPRT            YES                         MDG23240
001718I  9EC2                2309           OCR   RC,R2             START THE DISC              MDG23250
00171AI                      2310           IFZ   ADC-4             IF 32 BIT
00171AI  DEB0 818B =0018A9I  2311           OC    RB,ESWRT          START THE SELCH    R04
                             2312           ELSE
                             2313           OC    RB,SWRT           START THE SELCH    R04
                             2314           ENDC
*00171EI 2304                2315           B     SELD1                                           MDG23270
001720I  9EC2                2316  ESRD     OCR   RC,R2             START THE DISC READ         MDG23280
001722I                      2317           IFZ   ADC-4             IF 32 BIT          R04
001722I  DEB0 8193 =0018B9I  2318           OC    RB,ESREAD         START THE ESELCH READ       MDG23290
                             2319           ELSE
                             2320           OC    RB,SREAD          START THE SELCH    R04
                             2321           ENDC
001726I  4120 835E =001A88I  2322  SELD1    BAL   R2,SETSEL         SET UP FOR SELCH INTERRUPT  MDG23440
00172AI  C200 8002 =001730I  2323           LPSW  CONTDS                                          MDG23450
001730I                      2324           ALIGN 8                                               MDG23460
         0000 1730I          2325  CONTDS   EQU   *                                               MDG23470
001730I                      2326           IFNZ  ADC-2                                           MDG23480
001730I  0000                2327           DC    X'0000',X'F0F0'                                 MDG23490
001732I  F0F0
001734I  0000 1738I          2328           DC    A(CONDS1)                                       MDG23500
                             2329           ELSE                                                  MDG23510
                             2330           DC    X'F000',Z(CONDS1)                               MDG23520
                             2331           ENDC                                                  MDG23530
                             2332  *                                                              MDG23540
001738I  4130 833E =001A7AI  2333  CONDS1   BAL   R3,SETCON                                       MDG23550
                             2334  *                                                              MDG23560
00173CI  9DA1                2335  CONDS3   SSR   RA,R1                                          MDG23570
00173EI  4210 852C =001C6EI  2336           BTC   1,DEVDU                                         MDG23580
001742I  4810 8AAE =0021F4I  2337           LH    R1,CONSTA                                       MDG23590
001746I  C310 0005           2338           THI   R1,X'05'          CONTROLLER ERROR ?          MDG23600
00174AI  2134                2339           BNZS  DSCERR                                          MDG23610
00174CI  4810 8AB8 =002208I  2340           LH    R1,SELERR                                       MDG23620
*001750I 233D                2341           BZ    DSCEND                                          MDG23630
001752I  4830 8AB6 =002200I  2342  DSCERR    LH    R3,RETRY          TRY TO RECOVER              MDG23640
001756I  2135                2343           BNZS  DSERR1                                          MDG23650
001758I  C810 00E3           2344           LHI   R1,X'E3'          RECOVERY UNSUCCESSFUL       MDG23660
00175CI  4300 8574 =001CD4I  2345           B     ERRA                                            MDG23670
001760I  2731                2346  DSERR1   SIS   R3,1                                           MDG23680
001762I  4030 8AA6 =002200I  2347           STH   R3,RETRY                                        MDG23690
001766I  4300 FE62 =0015CCI  2348           B     SELWRT                                          MDG23700
00176AI  4130 82A2 =001A10I  2349  DSCEND   BAL   R3,FRSRW           WAIT FOR DISC ADD. INTERLOCK MDG23710
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00176EI  5830 8A4A =0021BCI   2350            LDA   R3,WRTEND                                    MDG23720
001772I  0303                 2351            BR    R3                                           MDG23730
                              2352  *                                                            MDG23740
         0000 1774I           2353  WRTPRT    EQU   *                                            MDG23750
001774I  C810 00E9            2354            LHI   R1,X'E9'          WRITE PROTECT ERROR        MDG23760
001778I  4300 8558 =001CD4I   2355            B     ERRA                                         MDG23770
                              2356  *                                                            MDG23780
                              2357  *                                                            MDG23790
00177CI  454F 4A20            2358  EOJ       DC    C'EOJ',X'0D0A'                               MDG23800
001780I  0D0A
                              2359  *                                                            MDG23810
                              2360  *                                                            MDG23820
                              2361  *                                                            MDG23830
                              2362  *                                                            MDG23840
                              2363  ************************************************************ MDG23850
                              2364  *                                                          * MDG23860
                              2365  *  L O D A D                                               * MDG23870
                              2366  *                                                          * MDG23880
                              2367  *   THIS ROUTINE WILL LOAD THE OUTDEV DEVICE ADDRESSES IN THE * MDG23890
                              2368  *   REGISTERS. THE ROUTINE WILL ABORT IF A DEVICE RESPONDS WITH * MDG23900
                              2369  *   "FALSE SYNC." OR A DEVICE IS "DU".  IT ALSO LOAD THE DEVICE * MDG23910
                              2370  *   INDICATOR. IF A DISC TRACK DENSITY AND MAXCYL ARE SET.  * MDG23920
                              2371  *                                                          * MDG23930
                              2372  *        INPUT: R3 = RETURN ADDRESS                        * MDG23940
                              2373  *                                                          * MDG23950
                              2374  *       OUTPUT: RA = DEVICE ADDRESS                        * MDG23960
                              2375  *               RB = SELCH ADDRESS                         * MDG23970
                              2376  *               RC = CONTROLLER ADDRESS                    * MDG23980
                              2377  *               R1 = DEVICE INDICATOR                      * MDG23990
                              2378  *                                                          * MDG24000
                              2379  *                                                          * MDG24010
                              2380  ************************************************************ MDG24020
001782I  48A0 8754 =001EDAI   2381  LODAD     LH    RA,OUTDEV+2       GET THE DEVICE ADDRESS   MDG24030
001786I  2135                 2382            BNZS  LOD1              ZERO ?                   MDG24040
001788I  C800 4534            2383            LHI   R0,C'E4'          YES                      MDG24050
00178CI  4300 8480 =001C10I   2384            B     ERROR                                      MDG24060
001790I  9DA1                 2385  LOD1      SSR   RA,R1             NO                       MDG24070
001792I  C510 0004            2386            CLHI  R1,X'04'          FALSE SYNC ?             MDG24080
001796I  2135                 2387            BNES  LOD1A                                      MDG24090
001798I  C810 00E6            2388            LHI   R1,X'E6'          YES                      MDG24100
00179CI  4300 8534 =001CD4I   2389            B     ERRA                                       MDG24110
0017A0I  C310 0001            2390  LOD1A     THI   R1,1              DU ?                     MDG24120
0017A4I  2335                 2391            BZS   LOD2               NO                       MDG24130
0017A6I  C810 00EE            2392            LHI   R1,X'EE'          YES                      MDG24140
0017AAI  4300 8526 =001CD4I   2393            B     ERRA                                       MDG24150
0017AEI  48B0 872A =001EDCI   2394  LOD2      LH    RB,OUTDEV+4       GET THE SELCH ADDRESS    MDG24160
0017B2I  233B                 2395            BZS   LOD3                                       MDG24170
0017B4I  DEB0 80F4 =0018ACI   2396            OC    RB,STOP           STOP THE SELCH           MDG24180
0017B8I  9DB1                 2397            SSR   RB,R1                                       MDG24190
0017BAI  C510 0004            2398            CLHI  R1,X'04'          FALSE SYNC ?             MDG24200
0017BEI  2135                 2399            BNES  LOD3              NO                       MDG24210
0017C0I  C810 00E6            2400            LHI   R1,X'E6'          YES                      MDG24220
0017C4I  4300 8510 =001CD8I   2401            B     ERRB                                       MDG24230
0017C8I  48C0 8712 =001EDEI   2402  LOD3      LH    RC,OUTDEV+6       GET THE CONTROLLER ADDRESS MDG24240
0017CCI  2339                 2403            BZS   LOD4                                       MDG24250
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0017CEI  9DC1                          SSR   RC,R1                                       MDG24260
0017D0I  C510 0004                     CLHI  R1,X'04'          FALSE SYNC ?              MDG24270
0017D4I  2135                          BNES  LOD4              NO                        MDG24280
0017D6I  C810 00E6                     LHI   R1,X'E6'          YES                       MDG24290
0017DAI  4300 84FE =001CDCI            B     ERRC                                        MDG24300
0017DEI  4810 86F6 =001ED8I      LOD4  LH    R1,OUTDEV         GET THE DEVICE INDICATOR  MDG24310
0017E2I  2135                          BNZS  LOD5                                        MDG24320
0017E4I  C800 4534                     LHI   R0,C'E4'          YES                       MDG24330
0017E8I  4300 8424 =001C10I            B     ERROR             ERROR                     MDG24340
0017ECI  4810 89D4 =0021C4I      LOD5  LH    R1,TRKDEN         GET OUTPUT TRKDEN         MDG24350
0017F0I  4010 8A1A =00220EI            STH   R1,CUTRKDEN       STORE IT                  MDG24360
0017F4I  4810 86E0 =001ED8I            LH    R1,OUTDEV                                   MDG24370
0017F8I  0303                          BR    R3                RETURN                    MDG24380
                                 *                                                       MDG24390
                                 ****************************************************************  MDG24400
                                 *                                                              *  MDG24410
                                 *  L I D A D                                                   *  MDG24420
                                 *                                                              *  MDG24430
                                 *   THIS ROUTINE WILL LOAD THE INDEV DEVICE ADDRESSES IN THE   *  MDG24440
                                 *   REGISTERS. THE ROUTINE WILL ABORT IF A DEVICE RESPONDS WITH *  MDG24450
                                 *   "FALSE SYNC" OR A DEVICE IS "DU". IT ALSO LOADS THE DEVICE  *  MDG24460
                                 *   INDICATOR. IF A DISC TRACK DENSITY AND MAXCYL ARE SET.     *  MDG24470
                                 *                                                              *  MDG24480
                                 *        INPUT: R3 = RETURN ADDRESS                            *  MDG24490
                                 *                                                              *  MDG24500
                                 *       OUTPUT: RA = DEVICE ADDRESS                            *  MDG24510
                                 *               RB = SELCH ADDRESS                             *  MDG24520
                                 *               RC = CONTROLLER ADDRESS                        *  MDG24530
                                 *               R1 = DEVICE INDICATOR                          *  MDG24540
                                 *                                                              *  MDG24550
                                 ****************************************************************  MDG24560
                                 *                                                       MDG24570
0017FAI  48A0 86E4 =001EE2I      LIDAD LH    RA,INDEV+2        GET THE DEVICE ADDRESS    MDG24580
0017FEI  2135                          BNZS  LID1              ZERO ?                    MDG24590
001800I  C800 4535                     LHI   R0,C'E5'          YES                       MDG24600
001804I  4300 8408 =001C10I            B     ERROR                                       MDG24610
001808I  9DA1                    LID1  SSR   RA,R1             NO                        MDG24620
00180AI  C510 0004                     CLHI  R1,X'04'          FALSE SYNC ?              MDG24630
00180EI  2135                          BNES  LID1A                                       MDG24640
001810I  C810 00E7                     LHI   R1,X'E7'          YES                       MDG24650
001814I  4300 84BC =001CD4I            B     ERRA                                        MDG24660
001818I  C310 0001               LID1A THI   R1,1              DU ?                      MDG24670
00181CI  2335                          BZS   LID2              NO                        MDG24680
00181EI  C810 00EF                     LHI   R1,X'EF'          YES                       MDG24690
001822I  4300 84AE =001CD4I            B     ERRA                                        MDG24700
001826I  48B0 86BA =001EE4I      LID2  LH    RB,INDEV+4        GET THE SELCH ADDRESS     MDG24710
00182AI  233B                          BZS   LID3                                        MDG24720
00182CI  DEB0 807C =0018ACI            OC    RB,STOP           STOP THE SELCH            MDG24730
001830I  9DB1                          SSR   RB,R1                                       MDG24740
001832I  C510 0004                     CLHI  R1,X'04'          FALSE SYNC ?              MDG24750
001836I  2135                          BNES  LID3              NO                        MDG24760
001838I  C810 00E7                     LHI   R1,X'E7'          YES                       MDG24770
00183CI  4300 8498 =001CD8I            B     ERRB                                        MDG24780
001840I  48CD 86A2 =001EE6I      LID3  LH    RC,INDEV+6        GET THE CONTROLLER ADDRESS  MDG24790
001844I  2339                          BZS   LID4                                        MDG24800
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001846I  9DC1                              SSR   RC,R1
001848I  C510 0004                         CLHI  R1,X'04'           FALSE SYNC ?
00184CI  2135                              BNES  LID4               NO
00184EI  C810 00E7                         LHI   R1,X'E7'           YES
001852I  4300 8486 =001CDCI                B     ERRC
001856I  4810 8686 =001EE0I        LID4    LH    R1,INDEV           GET THE DEVICE INDICATOR
00185AI  2135                              BNZS  LID5
00185CI  C800 4535                         LHI   R0,C'E5'           YES
001860I  4300 83AC =001C10I                B     ERROR
001864I  4810 895E =0021C6I        LID5    LH    R1,TRKDEN+2        GET INPUT TRKDEN
001868I  4010 89A2 =00220EI                STH   R1,CUTRKDEN        STORE IT
00186CI  4810 8670 =001EE0I                LH    R1,INDEV
001870I  0303                              BR    R3                 RETURN
                                   *
                                   *
                                   *
                                   *
                                   *
                                   *  S T B K A D
                                   *
                                   *     THIS ROUTINE WILL RETURN THE PROPER VALUES TO SET UP THE
                                   *     SELCH OR TO SET UP THE WRITE BLOCK.
                                   *
                                   *        INPUT = RD = LOW ADDRESS TO BE COPIED
                                   *                RE = HIGH ADDRESS TO BE COPIED
                                   *                R3 = RETURN ADDRESS
                                   *        OUTPUT = R4 = 0 MORE DATA BLOCKS REQUIRED TO FINISH
                                   *                        THE ENTIRE TRANSFER
                                   *                   = F INDICATES THAT THIS IS THE LAST
                                   *                       BLOCK OF THE TRANSFER
                                   *                R5 = LOW ADDRESS FOR THIS BLOCK
                                   *                R6 = HIGH ADDRESS FOR THIS BLOCK
                                   *                RD = ENTRY VALUE + X'100'
                                   *                RE = ENTRY VALUE (NEVER ALTERED)
                                   *
 001872I  085D                     STBKAD  LDAR  R5,RD              COPY THE LOW POINTER
 001874I  086E                             LDAR  R6,RE              COPY THE HIGH POINTER
 001876I  0B65                             SAR   R6,R5              SUBTRACT (HIGH - LOW)
 001878I  C560 00FF                        CLHI  R6,X'FF'
*00187CI  218A                             BL    NOMORE
*00187EI  2339                             BE    NOMORE
 001880I  085D                             LDAR  R5,RD
*001882I  CAD0 0100                        AAI   RD,X'100'
 001886I  0865                             LDAR  R6,R5
*001888I  CA60 00FF                        AAI   R6,X'FF'
 00188CI  2440                             LIS   R4,0
 00188EI  0303                             BR    R3
                                   *
 001890I  244F                     NOMORE  LIS   R4,15
 001892I  C560 0000                        CLHI  R6,X'00'           DIFFERENCE = 0 ?
*001896I  2334                             BE    NOMO1
 001898I  085D                             LDAR  R5,RD
 00189AI  086E                             LDAR  R6,RE
 00189CI  0303                             BR    R3
                                   *
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                          *                                                           MDG25360
00189EI  085D             NOM01   LDAR  R5,RD                                         MDG25370
0018A0I  0865                     LDAR  R6,R5                                         MDG25380
0018A2I  2661                     AIS   R6,1         ADD 1 SO THAT A MIN. OF 2 BYTES  MDG25390
                          *                     WILL BE TRANSFERED                    MDG25400
0018A4I  0303                     BR    R3                                            MDG25410
                          *                                                           MDG25420
                          *                                                           MDG25430
                          *                                                           MDG25440
                          *                                                           MDG25450
0018A6I  2313             FWFM    DC    X'2313'      FORWARD FM / BACKSPACE FM        MDG25460
         0000 18A7I       BKFM    EQU   FWFM+1                                        MDG25470
                          *                                                           MDG25480
0018A8I  2250             MTWRT   DC    X'2250'                                       MDG25490
         0000 18A9I       ESWRT   EQU   MTWRT+1                                       MDG25500
                          *                                                           MDG25510
0018AAI  C030             DISABL  DC    X'C030'      DISABLE / WFM                    MDG25520
         0000 18ABI       WFM     EQU   DISABL+1                                      MDG25530
                          *                                                           MDG25540
0018ACI  0811             STOP    DC    X'0811'      STOP/BKSP                        MDG25550
         0000 18ADI       BKSP    EQU   STOP+1                                        MDG25560
                          *                                                           MDG25570
0018AEI  10C2             SWRT    DC    X'10C2'      SELCH GO / SEEK                  MDG25580
         0000 18AFI       SEEK    EQU   SWRT+1                                        MDG25590
                          *                                                           MDG25600
0018B0I  C8C1             RESET   DC    X'C8C1'                                       MDG25610
         0000 18B1I       RESTOR  EQU   RESET+1                                       MDG25620
                          *                                                           MDG25630
0018B2I  0302             RCHECK  DC    X'0302'      READ CHECK / DISC WRITE          MDG25640
         0000 18B3I       DWRIT   EQU   RCHECK+1                                      MDG25650
                          *                                                           MDG25660
0018B4I  2038             CLEAR   DC    X'2038'      CLEAR / REWIND                   MDG25670
         0000 18B5I       REWIND  EQU   CLEAR+1                                       MDG25680
                          *                                                           MDG25690
0018B6I  0121             DREAD   DC    X'0121'      DISC READ / MT READ              MDG25700
         0000 18B7I       MTREAD  EQU   DREAD+1                                       MDG25710
                          *                                                           MDG25720
0018B8I  3070             SREAD   DC    X'3070'                                       MDG25730
         0000 18B9I       ESREAD  EQU   SREAD+1                                       MDG25740
                          *                                                           MDG25750
0018BAI  4800             ESTOP   DC    X'4800'      ESELCH STOP                      MDG25760
                          *                                                           MDG25770
                          *                                                           MDG25780
         0000 18BCI       CRLF    EQU   *                                             MDG25790
0018BCI  E620 809E =00195EI       LDAI  R2,AST+2     LOAD ADDRESS                     MDG25800
0018C0I  4130 8002 =0018C6I       BAL   R3,PRINT     DO CR/LF                         MDG25810
0018C4I  030E                     BR    RE           RETURN                           MDG25820
                          *                                                           MDG25830
                          *                                                           MDG25840
                          *                                                           MDG25850
                          *                                                           MDG25860
                          *      P R I N T                                            MDG25870
                          *                                                           MDG25880
                          *THIS SUBROUTINE WILL PRINT TO THE TTY, CRT, OR CAROUSEL ON PASLA  MDG25890
                          *                                                           MDG25900
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                                2569  *  INPUT TO THE ROUTINE                                                    MDG25910
                                2570  *                                                                         MDG25920
                                2571  *        R1 = NUMBER OF CHARACTERS TO BE OUTPUT                           MDG25930
                                2572  *        R2 = THE ADDRESS OF THE OUTPUT BUFFER                            MDG25940
                                2573  *        R3 = THE RETURN ADDRESS                                          MDG25950
                                2574  *                                                                         MDG25960
                                2575  *                                                                         MDG25970
      0000 18C6I                2576  PRINT    EQU   *                                                          MDG25980
0018C6I D342 0000               2577  PRINT2   LB    R4,0(R2)            GET A MESSAGE BYTE                    MDG25990
0018CAI 41F0 8016 =0018E4I      2578           BAL   LINK,OUTCHR         OUTPUT IT                             MDG26000
0018CEI 274D                    2579           SIS   R4,13               CR ?                                  MDG26010
*0018D0I 2333                   2580           BZ    PRINT3              MSG OVER                              MDG26020
0018D2I 2621                    2581           AIS   R2,1                                                      MDG26030
0018D4I 2207                    2582           BS    PRINT2              LOOP FOR NEXT CHAR                    MDG26040
0018D6I 244A                    2583  PRINT3   LIS   R4,10               LF                                    MDG26050
0018D8I 41F0 8008 =0018E4I      2584           BAL   LINK,OUTCHR         LF                                    MDG26060
0018DCI 2541                    2585           LCS   R4,1                DEL                                   MDG26070
0018DEI 41F0 8002 =0018E4I      2586  PRINT3B  BAL   LINK,OUTCHR         TERMINAL CHARACTER                    MDG26080
0018E2I 0303                    2587  PRNTEX   BR    R3                  RETURN                                MDG26090
                                2588  *  TO OUTPUT A CHARACTER TO THE LIST DEVICE                              MDG26100
                                2589  *                                                                         MDG26110
      0000 18E4I                2590  OUTCHR   EQU   *                                                          MDG26120
0018E4I 2400                    2591           LIS   R0,0                CLEAR                                 MDG26130
0018E6I 4000 807A =001964I      2592           STH   R0,PAUSE                                                  MDG26140
0018EAI 4800 E738 =000026I      2593           LH    R0,CONRADR          GET READ ADDRESS                      MDG26150
0018EEI 4810 E73A =00002CI      2594           LH    R1,CON2ND           GET 2ND CMD                           MDG26160
0018F2I 2332                    2595           BZS   OTC.0               SKIP IF ZERO                          MDG26170
0018F4I 9E01                    2596           OCR   R0,R1               ISSUE 2ND CMD                         MDG26180
      0000 18F6I                2597  OTC.0    EQU   *                                                          MDG26190
0018F6I 4800 E72C =000026I      2598           LH    R0,CONRADR          GET READ ADDRESS                      MDG26200
0018FAI D310 E72C =00002AI      2599           LB    R1,CONRD            GET READ COMMAND                      MDG26210
0018FEI 9E01                    2600           OCR   R0,R1               ISSUE READ CMD                        MDG26220
001900I 9D01                    2601           SSR   R0,R1               SENSE STATUS                          MDG26230
*001902I 2386                   2602           BFC   8,OTC.2             BRANCH IF CHAR. IS TO BE READ         MDG26240
001904I 4810 805C =001964I      2603  OTC.1    LH    R1,PAUSE            PAUSED NOW ?                          MDG26250
001908I 2039                    2604           BNZS  OTC.0               YES, LOOP                             MDG26260
00190AI 4300 8020 =00192EI      2605           B     OUTCHR2             NO, GO OUTPUT CHARACTER               MDG26270
00190EI 9B01                    2606  OTC.2    RDR   R0,R1               GET CHARACTER                         MDG26280
001910I C410 007F               2607           NHI   R1,X'7F'                                                  MDG26290
001914I CB10 0012               2608           SHI   R1,X'12'            DC2 ?                                 MDG26300
*001918I 2134                   2609           BNZ   OTC.3                                                     MDG26310
00191AI 4010 8046 =001964I      2610           STH   R1,PAUSE                                                  MDG26320
00191EI 2308                    2611           BS    OUTCHR2                                                   MDG26330
001920I 2712                    2612  OTC.3    SIS   R1,2                DC4 ?                                 MDG26340
001922I 4230 FFD0 =0018F6I      2613           BNZ   OTC.0               NO, GO WAIT FOR DC2                   MDG26350
001926I 40F0 803A =001964I      2614           STH   LINK,PAUSE                                                MDG26360
00192AI 4300 FFC8 =0018F6I      2615           B     OTC.0                                                     MDG26370
                                2616  *                                                                         MDG26380
00192EI 4010 8032 =001964I      2617  OUTCHR2  STH   R1,PAUSE            RESET FLAG                            MDG26390
001932I 4800 E6F2 =000028I      2618           LH    R0,CONWADR          GET WRITE ADDRESS                     MDG26400
001936I D310 E6F1 =00002BI      2619           LB    R1,CONWRT           GET WRITE COMMAND                     MDG26410
00193AI 9E01                    2620           OCR   R0,R1               ISSUE WRITE CMD                       MDG26420
00193CI 9D01                    2621  OTC.4    SSR   R0,R1               WAIT FOR NOT BUSY                     MDG26430
*00193EI 211A                   2622           BTC   1,OUTO              BRANCH IF OFF-LINE                    MDG26440
001940I C510 000C               2623           CLHI  R1,12               PASLA OFFLINE ?                       MDG26450
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*001944I  2337                          BE    OUT0              BRANCH: YES.              MDG26460
 001946I  C310 0008                     THI   R1,8              BUSY ?                    MDG26470
*00194AI  2037                          BNZ   OTC.4             WAIT FOR NOT BUSY.        MDG26480
 00194CI  9A04                          WDR   R0,R4             OUTPUT DATA BYTE          MDG26490
          0000 194EI           OTC.5    EQU   *                                           MDG26500
 00194EI  9D01                          SSR   R0,R1                                       MDG26510
*001950I  2081                          BTC   8,OTC.5           WAIT FOR BUSY TO DROP     MDG26520
          0000 1952I           OUT0     EQU   *                                           MDG26530
          0000 1952I           OUT1     EQU   *                                           MDG26540
 001952I  030F                          BR    LINK              RETURN                    MDG26550
                               *-*------------------------                                MDG26560
                               *                                                          MDG26570
                               *                                                          MDG26580
 001954I  4D44 4752 3034       TITLE    DC    C'MDGR04',X'0D0A'                           MDG26590
 00195AI  0D0A
 00195CI  2A20                 AST      DC    C'*',X'D0A'                                 MDG26600
 00195EI  0D0A
 001960I  3F20                 QUST     DC    C'?',X'D0A'                                 MDG26610
 001962I  0D0A
 001964I  0000                 PAUSE    DC    X'0'                                        MDG26620
                               ******************************************************    MDG26630
                               *                                                          MDG26640
                               *   G E T C H R                                            MDG26650
                               *                                                          MDG26660
                               *     GETS A CHARACTER FROM INBUF AND RETURNS IT IN R0     MDG26670
                               *                                                          MDG26680
                               *                                                      *   MDG26690
                               *                                                      *   MDG26700
                               *         INPUT: R3 = RETURN ADDRESS                   *   MDG26710
                               *                R1 = POINTER TO THE DESIRED CHARACTER *   MDG26720
                               *                                                      *   MDG26730
                               *        OUTPUT: R0 = CHARACTER DESIRED                *   MDG26740
                               *                                                      *   MDG26750
                               ******************************************************    MDG26760
                               *                                                      *   MDG26770
 001966I  C510 0032            GETCHR   CLHI  R1,50             MAX ?                     MDG26780
*00196AI  2385                          BNL   QUEST             YES                       MDG26790
 00196CI  D301 8580 =001EF0I            LB    R0,INBUF(R1)      GET THE CHAR.             MDG26800
 001970I  2611                          AIS   R1,1              BUMP POINTER              MDG26810
 001972I  0303                          BR    R3                RETURN                    MDG26820
          0000 1974I           QUEST    EQU   *                                           MDG26830
 001974I  41E0 FF44 =0018BCI            BAL   RE,CRLF           DO CR/LF                  MDG26840
 001978I  E620 FFE4 =001960I            LDAI  R2,QUST                                     MDG26850
 00197CI  4300 E718 =000098I            B     REDPTX                                      MDG26860
                               *                                                          MDG26870
                               ******************************************************    MDG26880
                               *                                                          MDG26890
                               *  N O M O T N                                             MDG26900
                               *                                                          MDG26910
                               ******************************************************    MDG26920
                               *                                                          MDG26930
                               *    WAIT FOR NO MOTION                                    MDG26940
                               *                                                          MDG26950
                               *          R0 = RETURN ADDRESS                             MDG26960
                               *          R1 = SCRATCH REGISTER                           MDG26970
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                                2676  *          RA = THE DEVICE ADDRESS                                          MDG26980
                                2677  *                                                                           MDG26990
                                2678  * ************************************************************************* MDG27000
                                2679  *                                                                           MDG27010
001980I  9DA1                   2680  NOMOTN   SSR   RA,R1              SENSE THE STATUS                        MDG27020
001982I  4210 82E8 =001C6EI     2681           BTC   1,DEVDU                                                     MDG27030
001986I  C310 0010              2682           THI   R1,X'10'            NOMOTION SET ?                          MDG27040
00198AI  2235                   2683           BZS   NOMOTN              NO - WAIT                               MDG27050
00198CI  0300                   2684           BR    R0                  YES - RETURN                            MDG27060
                                2685  *                                                                           MDG27070
         0000 198EI             2686  BKFMNM   EQU   *                                                         MDG27080
00198EI  9DA1                   2687           SSR   RA,R1                                                       MDG27090
001990I  4210 82DA =001C6EI     2688           BTC   1,DEVDU                                                     MDG27100
001994I  C310 0020              2689           THI   R1,X'20'            ET BIT SET ?                            MDG27110
001998I  2135                   2690           BNZS  PBOV                                                        MDG27120
00199AI  C310 0010              2691           THI   R1,X'10'            NO MOTION ?                             MDG27130
00199EI  2238                   2692           BZS   BKFMNM              NO                                      MDG27140
0019A0I  0300                   2693           BR    R0                                                          MDG27150
                                2694  *                                                                           MDG27160
0019A2I  41E0 FF16 =0018BCI     2695  PBOV     BAL   RE,CRLF             DO CRLF                                 MDG27170
0019A6I  E620 8008 =0019B2I     2696           LDAI  R2,BOV              PRINT "BOV"                             MDG27180
0019AAI  4130 FF18 =0018C6I     2697           BAL   R3,PRINT                                                    MDG27190
0019AEI  4300 FD0E =0016C0I     2698           B     PEOJ                                                        MDG27200
                                2699  *                                                                           MDG27210
                                2700  *                                                                           MDG27220
0019B2I  424F 5620              2701  BOV      DC    C'BOV',X'0D0A'                                              MDG27230
0019B6I  0D0A
                                2702  *                                                                           MDG27240
                                2703  *                                                                           MDG27250
                                2704  *                                                                           MDG27260
                                2705  ************************************************************************* MDG27270
                                2706  *                                                                       *   MDG27280
                                2707  *                                                                       *   MDG27290
                                2708  *  L O K I N                                                            *   MDG27300
                                2709  *                                                                       *   MDG27310
                                2710  *   THIS ROUTINE WILL LOCK THE INPUT DEVICE INDICATING AN ERROR,        *   MDG27320
                                2711  *   OR EOV.  WHEN A DEVICE IS LOCKED COPY CANNOT BE USED WITH           *   MDG27330
                                2712  *   THAT DEVICE                                                         *   MDG27340
                                2713  *                                                                       *   MDG27350
                                2714  *        INPUT : R3 = RETURN ADDRESS                                    *   MDG27360
                                2715  *                                                                       *   MDG27370
                                2716  *       OUTPUT: THE LOCK WORD IS SET (DEVICE LOCKED)                    *   MDG27380
                                2717  *                                                                       *   MDG27390
                                2718  *                                                                       *   MDG27400
                                2719  ************************************************************************* MDG27410
         0000 19B8I             2720  LOKIN    EQU   *                                                         MDG27420
*0019B8I  2511                  2721           LHI   R1,X'FFFF'                                                  MDG27430
 0019BAI  4010 852E =001EECI    2722           STH   R1,PGMIPN                                                   MDG27440
 0019BEI  4010 852C =001EEEI    2723           STH   R1,PGMIPN+2                                                 MDG27450
 0019C2I  0303                  2724           BR    R3                                                          MDG27460
                                2725  *                                                                           MDG27470
                                2726  ************************************************************************* MDG27480
                                2727  *                                                                       *   MDG27490
                                2728  *  L O K O U T                                                          *   MDG27500
                                2729  *                                                                       *   MDG27510
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                                2730  *   THIS ROUTINE WILL LOCK THE OUTPUT DEVICE - INDICATING AN ERROR,   *   MDG27520
                                2731  *   OR EOV.  WHEN A DEVICE IS LOCKED COPY CANNOT BE USED WITH THAT    *   MDG27530
                                2732  *    DEVICE.                                                          *   MDG27540
                                2733  *                                                                     *   MDG27550
                                2734  *        INPUT: R3 = RETURN ADDRESS                                   *   MDG27560
                                2735  *                                                                     *   MDG27570
                                2736  *       OUTPUT: THE LOCK IS SET (DEVICE LOCKED)                       *   MDG27580
                                2737  *                                                                     *   MDG27590
                                2738  *                                                                     *   MDG27600
                                2739  ***********************************************************************   MDG27610
        0000 19C4I              2740  LOKOUT   EQU   *                                                        MDG27620
*0019C4I 2511                   2741           LHI   R1,X'FFFF'          SET THE LOCKOUT INDICATOR           MDG27630
 0019C6I 4010 851E =001EE8I     2742           STH   R1,PGMOPN                                               MDG27640
 0019CAI 4010 851C =001EEAI     2743           STH   R1,PGMOPN+2                                             MDG27650
 0019CEI 0303                   2744           BR    R3                                                      MDG27660
                                2745  *                                                                     *   MDG27670
                                2746  ***********************************************************************   MDG27680
                                2747  *                                                                     *   MDG27690
                                2748  *  Z S E Q                                                            *   MDG27700
                                2749  *                                                                     *   MDG27710
                                2750  *   THIS ROUTINE WILL ZERO (ASCII) THE SEQUENCE NUMBER FIELD.         *   MDG27720
                                2751  *   THIS INDICATES AN ILLEGAL NUMBER.                                 *   MDG27730
                                2752  *                                                                     *   MDG27740
                                2753  *        INPUT: R3 = RETURN ADDRESS                                   *   MDG27750
                                2754  *                                                                     *   MDG27760
                                2755  *       OUTPUT: SEQUENCE NUMBER = 0                                   *   MDG27770
                                2756  *                                                                     *   MDG27780
                                2757  *                                                                     *   MDG27790
                                2758  ***********************************************************************   MDG27800
                                2759  *                                                                     *   MDG27810
 0019D0I C810 3030              2760  ZSEQ     LHI   R1,X'3030'          ZERO THE SEQUENCE                   MDG27820
 0019D4I 4010 8590 =001F68I     2761           STH   R1,SEQNAM           NUMBER SO A CREATE                  MDG27830
 0019D8I D210 858E =001F6AI     2762           STB   R1,SEQNAM+2         CANNOT BE DONE                      MDG27840
 0019DCI 0303                   2763           BR    R3                                                      MDG27850
                                2764  ***********************************************************************   MDG27860
                                2765  *                                                                         MDG27870
                                2766  *  W D F T                                                                MDG27880
                                2767  *                                                                         MDG27890
                                2768  ***********************************************************************   MDG27900
                                2769  ***********************************************************************   MDG27910
                                2770  *    WRITE THE DATA TO THE FILE                                           MDG27920
                                2771  *                                                                         MDG27930
                                2772  *         RA =  FILE ADDRESS                                              MDG27940
                                2773  *         R3 =  RETURN ADDRESS                                            MDG27950
                                2774  *         R1 =  USED AS SCRATCH                                           MDG27970
                                2775  *                                                                         MDG27980
                                2776  ***********************************************************************   MDG27990
 0019DEI 4810 882C =0022CEI     2777  WDFT     LH    R1,CUTRKDEN                                             MDG28000
 0019E2I 2718                   2778           SIS   R1,8                SEE IF 10 MB                  R04
*0019E4I 233E                   2779           BZ    WDFT3               SKIP IF YES                   R04
 0019E6I D8A0 8818 =002202I     2780           WH    RA,HEAD             HEAD NUMBER TO DRIVE          R04
 0019EAI DEA0 8020 =001A0EI     2781           OC    RA,SETHEAD          SET HEAD REGISTER             R04
 0019EEI 9DC1                   2782  WDFT1    SSR   RC,R1               WAIT FOR CONTROLLER IDLE      R04
*0019F0I 2221                   2783           BFC   2,WDFT1             *                             R04
 0019F2I D8A0 880A =002200I     2784           WH    RA,CYL              SEND CYLINDER NUMBER TO DRIVE R04
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0019F6I  DEA0 8015 =001A0FI   2785            OC    RA,SETCYL          SET CYLINDER REGISTER          R04
0019FAI  9DC1                 2786  WDFT2     SSR   RC,R1              *                              R04
*0019FCI 2221                 2787            BFC   2,WDFT2            WAIT FOR CONTROLLER IDLE       R04
0019FEI  0303                 2788            BR    R3                 RETURN TO CALL                 R04
001A00I  DAA0 87FC =002200I   2789  WDFT3     WD    RA,CYL             SEND CYLINDER NUMBER TO DRIVE  R04
001A04I  DAA0 87F9 =002201I   2790            WD    RA,CYL+1           LS BYTE OF CYLINDER            R04
001A08I  9DC1                 2791  WDFT4     SSR   RC,R1              WAIT FOR CONTROLLER IDLE       R04
*001A0AI 2221                 2792            BFC   2,WDFT4            *                              R04
001A0CI  0303                 2793            BR    R3                 RETURN TO CALL                 R04
001A0EI  20                   2794  SETHEAD   DB    X'20'              *                              R04
001A0FI  10                   2795  SETCYL    DB    X'10'              *                              R04
                              2796  *                                                                 MDG28260
                              2797  ********************************************************************** MDG28270
                              2798  *                                                                   MDG28280
                              2799  *  F R S R W                                                        MDG28290
                              2800  *                                                                   MDG28300
                              2801  ********************************************************************** MDG28310
                              2802  *                                                                   MDG28320
                              2803  *    FILE READY TO SEEK READ OR WRITE ?                             MDG28330
                              2804  *                                                                   MDG28340
                              2805  *         R3  =  RETURN ADDRESS                                     MDG28350
                              2806  *                                                                   MDG28360
                              2807  ********************************************************************** MDG28370
                              2808  *                                                                   MDG28380
001A10I  9DC1                 2809  FRSRW     SSR   RC,R1                                               MDG28390
001A12I  2221                 2810            BFBS  2,1                WAIT FOR CONTROLLER IDLE       MDG28400
001A14I  9DA1                 2811            SSR   RA,R1                                               MDG28410
001A16I  4210 8254 =001C6EI   2812            BTC   1,DEVDU                                             MDG28420
*001A1AI 2173                 2813            BTC   7,FRSERR                                            MDG28430
*001A1CI 2086                 2814            BTC   8,FRSRW                                             MDG28440
001A1EI  0303                 2815            BR    R3                                                  MDG28450
001A20I  C310 0030            2816  FRSERR    THI   R1,X'30'                                            MDG28460
*001A24I 2135                 2817            BNZ   ILLADD                                              MDG28470
001A26I  C810 00E8            2818            LHI   R1,X'E8'                                            MDG28480
001A2AI  4300 82A6 =001CD4I   2819            B     ERRA                                                MDG28490
                              2820  *                                                                   MDG28500
                              2821  *                                                                   MDG28510
001A2EI  C810 00EA            2822  ILLADD    LHI   R1,X'EA'                                            MDG28520
001A32I  4300 829E =001CD4I   2823            B     ERRA                                                MDG28530
                              2824  *                                                                   MDG28540
                              2825  *                                                                   MDG28550
                              2826  *                                                                   MDG28560
                              2827  ********************************************************************** MDG28570
                              2828  *                                                                   MDG28580
                              2829  *  R C H K                                                          MDG28590
                              2830  *                                                                   MDG28600
                              2831  ********************************************************************** MDG28610
                              2832  *                                                                   MDG28620
                              2833  *    READ CHECK SUBROUTINE                                          MDG28630
                              2834  *                                                                   MDG28640
                              2835  *          R3 = RETURN ADDRESS                                      MDG28650
                              2836  *          R8 = SECTOR NUMBER                                       MDG28660
                              2837  *                                                                   MDG28670
001A36I  5030 877A =0021B4I   2838  RCHK      STA   R3,ADDRES          SAVE RETURN ADDRESS            MDG28680
001A3AI  4870 8786 =0021C4I   2839            LH    R7,TRKDEN                                           MDG28690
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 001A3EI  C570 0008            2840          CLHI  R7,8              SEE IF 10 MB DRIVE                R04   MDG28700
*001A42I  233C                 2841          BE    RCHK1             BRANCH IF YES                     R04   MDG28710
 001A44I  4130 FF96 =0019DEI   2842          BAL   R3,WDFT           ELSE SEND HEAD & CYLINDER INFO          MDG28720
 001A48I  9AC8                 2843          WDR   RC,R8             SEND SECTOR TO CONTROLLER               
 001A4AI  4830 87B4 =002202I   2844          LH    R3,HEAD                                                   MDG28740
 001A4EI  113A                 2845          SLLS  R3,10                                                     MDG28750
 001A50I  4870 87AC =002200I   2846          LH    R7,CYL                                                    MDG28760
 001A54I  0637                 2847          OAR   R3,R7             MERGE CYLINDER AND HEAD                 MDG28770
 001A56I  98C3                 2848          WHR   RC,R3             SEND TO CONTROLLER                      MDG28780
*001A58I  230A                 2849          B     RCHK3                                                     MDG28790
 001A5AI  4130 FFB2 =001A10I   2850  RCHK1   BAL   R3,FRSRW          WAIT FOR DISK READY                     MDG28800
 001A5EI  4130 FF7C =0019DEI   2851          BAL   R3,WDFT           SET UP DRIVE                            MDG28810
 001A62I  4830 879C =002202I   2852          LH    R3,HEAD                                                   MDG28820
 001A66I  1135                 2853          SLLS  R3,5                                                      MDG28830
 001A68I  0638                 2854          OAR   R3,R8             MERGE CYLINDER AND HEAD INFO            MDG28840
 001A6AI  9AC3                 2855          WDR   RC,R3             SEND TO CONTROLLER                      MDG28850
 001A6CI  DEC0 FE42 =0018B2I   2856  RCHK3   OC    RC,RCHECK         ISSUE READ CHECK COMMAND                MDG28860
 001A70I  4130 8006 =001A7AI   2857          BAL   R3,SETCON         WAIT FOR IDLE, THEN RESET CONTROLLER    MDG28870
                               2858  *                                                                       MDG28880
 001A74I  5830 873C =0021B4I   2859  RCHK2   LDA   R3,ADDRES         GET ADDRESS                             MDG28890
 001A78I  0303                 2860          BR    R3                RETURN                                  MDG28900
                               2861  *                                                                       MDG28910
                               2862  ************************************************************************MDG28920
                               2863  *                                                                       MDG28930
                               2864  *  S E T C O N                                                          MDG28940
                               2865  *                                                                       MDG28950
                               2866  ************************************************************************MDG28960
                               2867  *                                                                       MDG28970
      0000 1A7AI               2868  SETCON  EQU   *                                                         MDG28980
 001A7AI  9DC1                 2869          SSR   RC,R1                                                     MDG28990
 001A7CI  2221                 2870          BFBS  2,SETCON          WAIT FOR IDLE                           MDG29000
 001A7EI  4010 8772 =0021F4I   2871          STH   R1,CONSTA         SAVE STATUS                             MDG29010
 001A82I  DEC0 FE2A =0018B0I   2872          OC    RC,RESET          RESET PENDING INT.                      MDG29020
 001A86I  0303                 2873          BR    R3                                                        MDG29030
                               2874  *                                                                       MDG29040
                               2875  *                                                                       MDG29050
                               2876  ************************************************************************MDG29060
                               2877  *                                                                       MDG29070
                               2878  *  S E T S E L                                                          MDG29080
                               2879  *                                                                       MDG29090
                               2880  ************************************************************************MDG29100
                               2881  *                                                                       MDG29110
      0000 1A88I               2882  SETSEL  EQU   *                                                         MDG29120
 001A88I  2400                 2883          LIS   R0,0                                                      MDG29130
 001A8AI  4000 877A =002208I   2884          STH   R0,SELERR                                                 MDG29140
 001A8EI                       2885          IFNZ  ADC-2                                                     MDG29150
 001A8EI  E600 8012 =001AA4I   2886          LA    R0,SELINT         GET THE INTERRUPT ADDRESS               MDG29160
 001A92I  081B                 2887          LDAR  R1,RB             GET THE SELCH ADDRESS                   MDG29170
 001A94I  4010 877A =002212I   2888  SETCOM  STH   R1,INTADD         SAVE INTERRUPT ADDRESS                  MDG29180
 001A98I  1111                 2889          SLLS  R1,1              MULTIPLY BY 2                           MDG29190
*001A9AI  CA10 00D0            2890          AAI   R1,X'D0'          ADD X'D0'                               MDG29200
 001A9EI  4001 0000            2891          STH   R0,0(R1)                                                  MDG29210
 001AA2I  0302                 2892          BR    R2                                                        MDG29220
                               2893  *                                                                       MDG29230
                               2894          ELSE                                                            MDG29240
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                                   *                                                            MDG29250
                                                LHI   R0,SELINT                                 MDG29260
                                                LDAR  R1,RB                                     MDG29270
                                   SETCOM       STH   R1,INTADD         SAVE INT ADDRESS        MDG29280
                                                LIS   R1,0                                      MDG29290
                                                STH   R1,X'44'                                  MDG29300
                                                STH   R0,X'46'                                  MDG29310
                                                BR    R2                                        MDG29320
                                   *                                                            MDG29330
                                                ENDC                                            MDG29340
                                   *                                                            MDG29350
                                   *                                                            MDG29360
          0000 1AA4I               SELINT       EQU   *                                         MDG29370
                                   *                                                            MDG29380
001AA4I                                         IFNZ  ADC-2                                     MDG29390
                                   *                                                            MDG29400
001AA4I   4840 876A =002212I                    LH    R4,INTADD                                 MDG29410
001AA8I   0542                                  CLAR  R4,R2                                     MDG29420
001AAAI   4230 8022 =001AD0I                    BNE   SELIN1                                    MDG29430
001AAEI   DEB0 FE08 =0018BAI                    OC    RB,ESTOP          GIVE THE ESELCH STOP COMMAND   MDG29460
          0000 1AB2I               SELST1       EQU   *                                         MDG29490
001AB2I   2460                                  LIS   R6,0                                      MDG29500
001AB4I   9B46                                  RDR   R4,R6             3 - READ THE MOST SIG. BYTE    MDG29530
001AB6I   3466                                  EXHR  R6,R6             LEFT 16            R04
001AB8I   2470                     SELIN2       LIS   R7,0                                      MDG29560
001ABAI   9947                                  RHR   R4,R7             READ A HALFWORD         MDG29570
001ABCI   0667                                  OAR   R6,R7             R6 = FINAL ADDRESS      MDG29580
001ABEI   5870 86F6 =0021B8I                    LDA   R7,FADD           GET THE FINAL ADDRESS   MDG29590
001AC2I   0576                                  CLAR  R7,R6             COMPARE THE ADDRESSES   MDG29600
*001AC4I  2137                                  BNE   SELIN9                                    MDG29610
001AC6I   2400                                  LIS   R0,0              REMOVE THE WAIT BIT     MDG29620
001AC8I   4000 873C =002208I                    STH   R0,SELERR         SET NO SELCH ERROR      MDG29630
*001ACCI  C800 30F0                             LI    R0,Y'000030F0'                            MDG29640
001AD0I   1800                     SELIN1       LPSWR R0                RETURN TO WHERE INTERRUPTED    MDG29650
                                   *                                                            MDG29660
001AD2I   240F                     SELIN9       LIS   R0,15             SET SELCH               MDG29670
001AD4I   4000 8730 =002208I                    STH   R0,SELERR         ERROR                   MDG29680
*001AD8I  C800 30F0                             LI    R0,Y'000030F0'                            MDG29690
001ADCI   1800                                  LPSWR R0                RETURN TO WHERE INTERRUPTED    MDG29700
                                   *                                                            MDG29710
                                                ELSE                                            MDG29720
                                   *                                                            MDG29730
                                                AIR   RF,R1                                     MDG29740
                                                CLHR  RF,RB                                     MDG29750
                                                BNES  SELIN3            NO                      MDG29760
                                                OC    RB,STOP           YES                     MDG29770
                                                RHR   RB,R9             READ END ADDRESS        MDG29780
                                                CLHR  R6,R9             COMPARE ADDRESSES ?     MDG29790
                                                BNE   SELIN4            NO                      MDG29800
                                                LIS   R9,0              SET NO                  MDG29810
                                                STH   R9,SELERR         SELCH ERROR             MDG29820
                                                LHI   R9,X'3000'        SET NEW PSW             MDG29830
                                                STH   R9,X'40'                                  MDG29840
                                   SELIN3       LPSW  X'40'             RETURN TO WHERE INTERRUPTED    MDG29850
                                   *                                                            MDG29860
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                                2950  SELIN4   LIS   R9,15              SET SELCH                          MDG29870
                                2951           STH   R9,SELERR          ERROR                              MDG29880
                                2952           LIS   R9,0                                                  MDG29890
                                2953           STH   R9,X'40'           ZERO THE PSW                       MDG29900
                                2954           LPSW  X'40'              RETURN TO WHERE INTERRUPTED        MDG29910
                                2955  *                                                                    MDG29920
                                2956           ENDC                                                        MDG29930
        0000 1ADEI              2957  LCORE    EQU   *                  INITIALIZE                         MDG29940
001ADEI                         2958           IFNZ  ADC-2                                                 MDG29950
                                2959  *                                                                    MDG29960
                                2960  *     INITIALIZE FOR THE 32 SERIES PROCESSOR                         MDG29970
                                2961  *                                                                    MDG29980
001ADEI  C200 8086 =001B68I     2962           LPSW  INIT32                                                MDG29990
*001AE2I C800 00F0              2963  GO32     LI    R0,Y'000000F0'                                        MDG30000
001AE6I  5000 0020              2964           ST    R0,X'20'                                              MDG30010
001AEAI  5000 0024              2965           ST    R0,X'24'                                              MDG30020
001AEEI  5000 0028              2966           ST    R0,X'28'                                              MDG30030
001AF2I  5000 002C              2967           ST    R0,X'2C'                                              MDG30040
001AF6I  5000 0030              2968           ST    R0,X'30'                                              MDG30050
001AFAI  E610 80B0 =001BAEI     2969           LA    R1,ILLIST                                             MDG30060
001AFEI  5010 0034              2970           ST    R1,X'34'                                              MDG30070
001B02I  5000 0038              2971           ST    R0,X'38'                                              MDG30080
001B06I  E610 80AC =001BB6I     2972           LA    R1,MCHMAL                                             MDG30090
001B0AI  5010 003C              2973           ST    R1,X'3C'                                              MDG30100
001B0EI  5000 0040              2974           ST    R0,X'40'                                              MDG30110
001B12I  5000 0044              2975           ST    R0,X'44'                                              MDG30120
001B16I  5000 0048              2976           ST    R0,X'48'                                              MDG30130
001B1AI  E610 8088 =001BA6I     2977           LA    R1,ARFLT                                              MDG30140
001B1EI  5010 004C              2978           ST    R1,X'4C'                                              MDG30150
001B22I  5000 0080              2979           ST    R0,X'80'                                              MDG30160
001B26I  E610 870E =002238I     2980           LA    R1,OLDPSW                                             MDG30170
001B2AI  C410 FF00              2981           NHI   R1,X'FF00'         MAKE 256 BYTE BOUNDARY             MDG30180
001B2EI  CA10 0100              2982           AHI   R1,X'100'          BUMP TO NEXT BOUNDARY              MDG30190
001B32I  4010 0084              2983           STH   R1,X'84'                                              MDG30200
001B36I  2618                   2984           AIS   R1,8               BUMP                               MDG30210
001B38I  4010 0086              2985           STH   R1,X'86'                                              MDG30220
001B3CI  4000 0088              2986           STH   R0,X'88'                                              MDG30230
001B40I  E610 80B8 =001BFCI     2987           LA    R1,IOVQU                                              MDG30240
001B44I  5010 008C              2988           ST    R1,X'8C'                                              MDG30250
001B48I  5000 0090              2989           ST    R0,X'90'                                              MDG30260
001B4CI  E610 80B2 =001C02I     2990           LA    R1,MACINT                                             MDG30270
001B50I  5010 0094              2991           ST    R1,X'94'                                              MDG30280
001B54I  5000 0098              2992           ST    R0,X'98'                                              MDG30290
001B58I  4000 00CC              2993           STH   R0,X'CC'                                              MDG30300
001B5CI  E610 8090 =001BF0I     2994           LA    R1,BNDYERR                                            MDG30310
001B60I  4010 00CE              2995           STH   R1,X'CE'                                              MDG30320
*001B64I 2306                   2996           B     INTCOM                                                MDG30330
                                2997  *                                                                    MDG30340
001B68I                         2998           ALIGN 8                                                     MDG30350
001B68I  0000                   2999  INIT32   DC    X'0000',X'30F0'                                       MDG30360
001B6AI  30F0
001B6CI  0000 1AE2I             3000           DC    A(GO32)                                               MDG30370
                                3001           ELSE                                                        MDG30380
                                3002           LPSW  INIT16                                                MDG30390
                                3003  GO16     XHR   R0,R0                                                 MDG30400
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                                         STH    R0,X'2C'
                                         STH    R0,X'34'
                                         STH    R0,X'3C'
                                         STH    R0,X'44'
                                         STH    R0,X'4C'
                                         LHI    R0,REGSAV
                                         STH    R0,X'22'
                                *
                                         LHI    R0,ARFLT
                                         STH    R0,X'2E'
                                         LHI    R0,ILLIST
                                         STH    R0,X'36'
                                         LHI    R0,MCHMAL
                                         STH    R0,X'3E'
                                         LHI    R0,INTER
                                         STH    R0,X'46'
                                         LHI    R0,DIVFLT
                                         STH    R0,X'4E'
                                         B      BEGIN
                                INIT16   DC     X'3000',Z(G016)
                                         ENDC
 001B70I  4830 8094 =001C08I    INTCOM   LH     R3,SVCERR
 001B74I  C810 009C                      LHI    R1,X'9C'
 001B78I  4031 0000             X9C      STH    R3,0(R1)
 001B7CI  2612                           AIS    R1,2
 001B7EI  C510 00BC                      CLHI   R1,X'BC'
 001B82I  2035                           BNES   X9C
 001B84I  0700                           XAR    R0,R0
 001B86I  4001 0000             XBC      STH    R0,0(R1)
 001B8AI  2612                           AIS    R1,2
 001B8CI  C510 00D0                      CLHI   R1,X'D0'
 001B90I  2035                           BNES   XBC
 001B92I  C800 1C0EI                     LHI    R0,INTER          SET THE ADDRESS
 001B96I  4001 0000             XCC      STH    R0,0(R1)
 001B9AI  2612                           AIS    R1,2
 001B9CI  C510 02D0                      CLHI   R1,X'2D0'
 001BA0I  2035                           BNES   XCC
 001BA2I  4300 E4A6 =00004CI             B      BEGIN
                                *
                                *
 001BA6I  C800 4630             ARFLT    LHI    R0,C'F0'          FLPT ARIT FAULT
 001BAAI  4300 8062 =001C10I             B      PSWE
 001BAEI  C800 4631             ILLIST   LHI    R0,C'F1'          ILLEGAL INST.
 001BB2I  4300 805A =001C10I             B      PSWE
 001BB6I                                 IFNZ   ADC-2
 001BB6I  95AA                  MCHMAL   EPSR   RA,RA             CAPTURE PSW
 001BB8I  5800 0040                      L      R0,X'40'          SEE IF S3200
 001BBCI  2336                           BZS    NOT3200           NO
 001BBEI  2113                           BMS    PWRDN             POWER DOWN
 001BC0I  C200 800C =001BD0I    PWRUP    LPSW   MCHPSW
 001BC4I  C200 8020 =001BE8I    PWRDN    LPSW   PFL
 001BC8I  08AA                  NOT3200  LDAR   RA,RA             SET CC
*001BCAI  211B                           BTC    1,PFAIL           POWER DOWN
*001BCCI  2206                           B      PWRUP             POWER RESTORE
                                         ELSE
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                                3059  MCHMAL   BTC   1,PFAIL                                                    MDG30960
                                3060           LPSW  MCHPSW                                                     MDG30970
                                3061           ENDC                                                             MDG30980
001BD0I                         3062           ALIGN 8                                                          MDG30990
            0000 1BD0I          3063  MCHPSW   EQU   *                                                          MDG31000
001BD0I                         3064           IFNZ  ADC=2                                                      MDG31010
001BD0I     0000                3065           DC    X'0000',X'30F0'                                            MDG31020
001BD2I     30F0
001BD4I     0000 1BD8I          3066           DC    A(MCH1)                                                    MDG31030
                                3067           ELSE                                                             MDG31040
                                3068           DC    X'3000',Z(MCH1)                                            MDG31050
                                3069           ENDC                                                             MDG31060
001BD8I     C800 4632           3070  MCH1     LHI   R0,C'F2'                                                   MDG31070
001BDCI     4300 8030 =001C10I  3071           B     PSWE                                                       MDG31080
001BE0I     C200 8004 =001BE8I  3072  PFAIL    LPSW  PFL                                                        MDG31090
001BE8I                         3073           ALIGN 8                                                          MDG31100
            0000 1BE8I          3074  PFL      EQU   *                                                          MDG31110
001BE8I                         3075           IFNZ  ADC=2                                                      MDG31120
001BE8I     0000                3076           DC    X'0000',X'B0F0'                                            MDG31130
001BEAI     B0F0
001BECI     0000 1BE0I          3077           DC    A(PFAIL)                                                   MDG31140
                                3078           ELSE                                                             MDG31150
                                3079           DC    X'B000',Z(PFAIL)                                           MDG31160
                                3080           ENDC                                                             MDG31170
001BF0I     C800 4638           3081  BNDYERR  LHI   R0,C'F8'          BOUNDARY VIOLATION                       MDG31180
*001BF4I    230E                3082           B     PSWE                                                       MDG31190
001BF6I     C800 4633           3083  DIVFLT   LHI   R0,C'F3'          DIVIDE FAULT                             MDG31200
*001BFAI    230B                3084           B     PSWE                                                       MDG31210
001BFCI     C800 4635           3085  IOVQU    LHI   R0,C'F5'          I/O QUEUE OVERFLOW                       MDG31220
*001C00I    2308                3086           B     PSWE                                                       MDG31230
001C02I     C800 4636           3087  MACINT   LHI   R0,C'F6'          MAC INTERRUPT                            MDG31240
*001C06I    2305                3088           B     PSWE                                                       MDG31250
001C08I     C800 4637           3089  SVCERR   LHI   R0,C'F7'          SVC INTERRUPT                            MDG31260
001C0CI     2302                3090           BS    PSWE                                                       MDG31270
            0000 1C0EI          3091  INTER    EQU   *                                                          MDG31280
001C0EI                         3092           IFNZ  ADC=2                                                      MDG31290
001C0EI     1800                3093           LPSWR R0                RETURN TO WHERE INTERRUPTED              MDG31300
                                3094           ELSE                                                             MDG31310
                                3095           AAI   RF,SCRAD                                                   MDG31320
                                3096           LPSW  X'40'             RETURN TO WHERE INTERRUPTED              MDG31330
                                3097           ENDC                                                             MDG31340
            0000 1C10I          3098  PSWE     EQU   *                                                          MDG31350
001C10I     4000 80AC =001CC0I  3099  ERROR    STH   R0,ERPTSS                                                  MDG31360
001C14I     C800 3030           3100           LHI   R0,X'3030'                                                 MDG31370
001C18I     4000 80A2 =001CBEI  3101           STH   R0,ERPTDD                                                  MDG31380
001C1CI     41E0 FC9C =0018BCI  3102           BAL   RE,CRLF           DO CR/LF                                 MDG31390
001C20I     E620 8092 =001CB6I  3103           LDAI  R2,ERPT                                                    MDG31400
001C24I     4130 FC9E =0018C6I  3104           BAL   R3,PRINT                                                   MDG31410
001C28I     4840 85DE =00220AI  3105  SSS      LH    R4,EOJFLG         SHOULD EOJ BE PRINTED ?                  MDG31420
*001C2CI    213A                3106           BNZ   YESEOJ            YES                                      MDG31430
001C2EI     C200 8006 =001C38I  3107           LPSW  NOEOJ             NO                                       MDG31440
001C38I                         3108           ALIGN 8                                                          MDG31450
            0000 1C38I          3109  NOEOJ    EQU   *                                                          MDG31460
001C38I                         3110           IFNZ  ADC=2                                                      MDG31470
001C38I     0000                3111           DC    X'0000',X'30F0'                                            MDG31480
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001C3AI  30F0
001C3CI  0000 009CI          3112            DC    A(REDTTY)                                    MDG31490
                             3113            ELSE                                               MDG31500
                             3114            DC    X'3000',Z(REDTTY)                            MDG31510
                             3115            ENDC                                               MDG31520
         0000 1C40I          3116  YESEOJ    EQU   *                                            MDG31530
001C40I  C200 8004 =001C48I  3117            LPSW  ERRPSW                                       MDG31540
001C48I                      3118            ALIGN 8                                            MDG31550
         0000 1C48I          3119  ERRPSW    EQU   *                                            MDG31560
001C48I                      3120            IFNZ  ADC-2                                        MDG31570
001C48I  0000                3121            DC    X'0000',X'30F0'                              MDG31580
001C4AI  30F0
001C4CI  0000 1C50I          3122            DC    A(PJABT)                                     MDG31590
                             3123            ELSE                                               MDG31600
                             3124            DC    X'3000',Z(PJABT)                             MDG31610
                             3125            ENDC                                               MDG31620
                             3126  *                                                            MDG31630
001C50I  41E0 FC68 =0018BCI  3127  PJABT     BAL   RE,CRLF              DO CR/LF              MDG31640
001C54I  E620 8008 =001C60I  3128            LDAI  R2,JABT                                      MDG31650
001C58I  4130 FC6A =0018C6I  3129            BAL   R3,PRINT                                     MDG31660
001C5CI  4300 E43C =00009CI  3130            B     REDTTY                                       MDG31670
                             3131  *                                                            MDG31680
001C60I  4A4F 4220 4142 4F52 3132  JABT      DC    C'JOB ABORTED',X'0D0A'                       MDG31690
001C68I  5445 4420
001C6CI  0D0A
                             3133  *                                                            MDG31700
         0000 1C6EI          3134  DEVDU     EQU   *                                            MDG31710
001C6EI  45A0 8268 =001EDAI  3135            CLH   RA,OUTDEV+2          IS IT OUTDEV ADDRESS DU ?  MDG31720
001C72I  2135                3136            BNES  IDEVDU               NO                     MDG31730
001C74I  C810 00EE           3137            LHI   R1,X'EE'             YES                    MDG31740
001C78I  4300 8058 =001CD4I  3138            B     ERRA                                         MDG31750
001C7CI  C810 00EF           3139  IDEVDU    LHI   R1,X'EF'             INDEV ADDRESS          MDG31760
001C80I  4300 8050 =001CD4I  3140            B     ERRA                                         MDG31770
                             3141  *                                                            MDG31780
001C84I  C810 00ED           3142  DIRFUL    LHI   R1,X'ED'             DIRECTORY FULL         MDG31790
001C88I  4300 8048 =001CD4I  3143            B     ERRA                                         MDG31800
                             3144  *                                                            MDG31810
                             3145  *   I S H X C O                                              MDG31820
                             3146  *                                                            MDG31830
                             3147  *  THIS ROUTINE WILL CHECK THE VALUE IN R0 TO BE SURE IT IS A MDG31840
                             3148  *   VALID HEX CHARACTER. IF IT IS IT WILL BE CONVERTED TO HEX. MDG31850
                             3149  *                                                            MDG31860
                             3150  *                                                            MDG31870
001C8CI  C500 0030           3151  ISHXCO    CLHI  R0,X'30'             NUMBER ?               MDG31880
001C90I  4280 FCE0 =001974I  3152            BL    QUEST                NO                     MDG31890
001C94I  C500 003A           3153            CLHI  R0,X'3A'             MAYBE - NUMBER ?       MDG31900
001C98I  218A                3154            BLS   ISNUM                YES                    MDG31910
001C9AI  C500 0041           3155            CLHI  R0,X'41'                                     MDG31920
001C9EI  4280 FCD2 =001974I  3156            BL    QUEST                                        MDG31930
001CA2I  C500 0047           3157            CLHI  R0,X'47'             A - F ?                MDG31940
001CA6I  2186                3158            BLS   ISAF                                         MDG31950
001CA8I  4300 FCC8 =001974I  3159            B     QUEST                                        MDG31960
001CACI  C400 000F           3160  ISNUM     NHI   R0,X'0F'             MAKE A HEX NUMBER      MDG31970
001CB0I  0303                3161            BR    R3                                           MDG31980
001CB2I  2609                3162  ISAF      AIS   R0,9                                         MDG31990
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001CB4I  2204                  3163          BS     ISNUM                                        MDG32000
                               3164   *                                                         MDG32010
                               3165   *                                                         MDG32020
                               3166   *                                                         MDG32030
                               3167   *                                                         MDG32040
                               3168   *                                                         MDG32050
                               3169   *                                                         MDG32060
                               3170   *                                                         MDG32070
001CB6I  4552 524F 5220 2020   3171   ERPT    DC     C'ERROR  '                                 MDG32080
001CBEI  4444                  3172   ERPTDD  DC     C'DD'                                      MDG32090
001CC0I  5353                  3173   ERPTSS  DC     C'SS'                                      MDG32100
001CC2I  0D0A                  3174           DC     X'D0A'                                     MDG32110
001CC4I  3031 3233 3435 3637   3175   ASCI    DC     C'0123456789ABCDEF'                        MDG32120
001CCCI  3839 4142 4344 4546
001CD4I  080A                  3176   ERRA    LDAR   R0,RA                                      MDG32130
001CD6I  2304                  3177           BS     ERR                                        MDG32140
001CD8I  080B                  3178   ERRB    LDAR   R0,RB                                      MDG32150
001CDAI  2302                  3179           BS     ERR                                        MDG32160
001CDCI  080C                  3180   ERRC    LDAR   R0,RC                                      MDG32170
001CDEI  1108                  3181   ERR     SLLS   R0,8                                       MDG32180
001CE0I  0601                  3182           OAR    R0,R1                                      MDG32190
001CE2I  2413                  3183           LIS    R1,3                                       MDG32200
001CE4I  242F                  3184   ERR1    LIS    R2,X'F'                                    MDG32210
                               3185   *                                                         MDG32220
001CE6I  0420                  3186           NAR    R2,R0                                      MDG32230
001CE8I  D332 FFD8 =001CC4I    3187           LB     R3,ASCI(R2)                                MDG32240
001CECI  D231 FFCE =001CBEI    3188           STB    R3,ERPTDD(R1)                              MDG32250
001CF0I  1004                  3189           SRLS   R0,4                                       MDG32260
001CF2I  2711                  3190           SIS    R1,1                                       MDG32270
001CF4I  2218                  3191           BNMS   ERR1                                       MDG32280
001CF6I  41E0 FBC2 =0018BCI    3192           BAL    RE,CRLF            DO CR/LF                MDG32290
001CFAI  E620 FFB8 =001CB6I    3193           LDAI   R2,ERPT                                    MDG32300
001CFEI  4130 FBC4 =0018C6I    3194           BAL    R3,PRINT                                   MDG32310
001D02I  4300 FF22 =001C28I    3195           B      SSS                                        MDG32320
                               3196   *                                                         MDG32330
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MAG TAPE BOOT LOADER

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                0000 000A           3198  R10      EQU   10
                0000 0009           3199  R11      EQU   11
                0000 000E           3200  R14      EQU   14
                0000 000F           3201  R15      EQU   15
                                    3202           NOSQZ

001D06I  D310 0078                  3204  MTBOOT   LB    R1,X'78'          GET TAPE DEVICE ADDRESS          R04
001D0AI  2420                       3205           LIS   R2,0              *                                R04
001D0CI  D330 007D                  3206           LB    R3,X'7D'          PICK UP SELCH ADDRESS            R04
001D10I  9423                       3207           EXBR  R2,R3             (R2)='SS00' OR '0000SS00'        R04
001D12I  EC20 0008                  3208           SRL   R2,8              IF 16 BIT, (R2,R3)='00SS,0000'   R04
                                    3209  *                                IF 32 BIT, (R2)=(R3)='000000SS'  R04
001D16I  9D19                       3210  MTBOOT1  SSR   R1,R9             STATUS CHECK                     R04
001D18I  919C                       3211           SLHLS R9,12             NO MOTION BIT TO CARRY           R04
                                    3212  *                                LS BYTE OF R9 = 00               R04
001D1AI  2282                       3213           BNCS  MTBOOT1           WAIT FOR NO-MOTION               R04
001D1CI  C850 0100                  3214           LHI   R5,X'100'         LOAD START ADDRESS               R04
001D20I  2461                       3215           LIS   R6,1              BXLE INCREMENT                   R04
001D22I  C870 026F                  3216           LHI   R7,MTLOADE-MTLOADS+X'100' LOAD END ADDRESS         R04
001D26I  C800 0030                  3217           LHI   R0,X'30'          SELCH READ COMMAND               R04
001D2AI  2448                       3218           LIS   R4,8              SELCH STOP COMMAND               R04
001D2CI  9E24                       3219           OCR   R2,R4             SELCH STOP                       R04
001D2EI  9A39                       3220           WDR   R3,R9             MS BYTE OF 3 BYTE ADDRESS        R04
                                    3221  *                                R3=SELCH ADDRESS IF 32 BIT HOST  R04
001D30I  9825                       3222           WHR   R2,R5             LS 2 BYTES OF START ADDRESS      R04
001D32I  9A39                       3223           WDR   R3,R9             MS BYTE OF 3 BYTE END ADDRESS    R04
001D34I  9827                       3224           WHR   R2,R7             LS 2 BYTES OF END ADDRESS        R04
001D36I  DE10 0079                  3225           OC    R1,X'79'          MAG TAPE WRITE                   R04
001D3AI  9E20                       3226           OCR   R2,R0             SELCH GO                         R04
001D3CI  2145                       3227           BOS   MTBOOT2           FALSE SYNC = NO SELCH            R04
001D3EI  9D29                       3228           SSR   R2,R9             ELSE, WAIT FOR SELCH NOT BUSY    R04
001D40I  2081                       3229           BTBS  8,1               LOOP ON BUSY                     R04
001D42I  9E24                       3230           OCR   R2,R4             SELCH STOP                       R04
001D44I  0305                       3231           BR    R5                BRANCH, START CODE JUST LOADED   R04
001D46I  9D19                       3232  MTBOOT2  SSR   R1,R9             MAG TAPE STATUS                  R04
001D48I  2081                       3233           BTBS  8,1               LOOP ON BUSY                     R04
001D4AI  0B15 0000                  3234           RD    R1,0(R5)          READ A BYTE                      R04
001D4EI  C150 00C0                  3235           BXLE  R5,MTBOOT2-MTBOOT+X'80' DECREMENT INDEX, LOOP      R04
001D52I  4300 0100                  3236           B     X'100'            GO TO LOAD START ADRS            R04
001D56I  0000                       3237           DCX   0000              FILLER                           R04
001D58I  0000                       3238           DCX   0000              FILLER                           R04
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                        3240  * THE FIRST PART OF THE BOOT LOADER RESIDES IN MEMORY                R04
                        3241  * FROM LOCATION X'80' TO X'CF'.  IT IS LOADED BY THE                  R04
                        3242  * X'50' SEQUENCE.  WHEN CONTROL IS TRANSFERRED TO IT,                 R04
                        3243  * THAT CODE READS IN THIS NEXT SECTION WHICH STARTS                   R04
                        3244  * AT ADDRESS X'100'.                                                  R04

                        3246  * ON INPUT, (R0)=SELCH READ COMMAND, X'30'                            R04
                        3247  *           (R1)=MAG TAPE DEVICE ADDRESS                             R04
                        3248  *           (R2)=SELCH ADDRESS                                       R04
                        3249  *           (R3)=0 IF 16 BIT HOST                                    R04
                        3250  *           (R3)=SELCH ADDRESS IF 32 BIT HOST                        R04
                        3251  *           (R4)=SELCH STOP COMMAND, X'08'                           R04
                        3252  *           (R6)=1                                                   R04
                        3253  *                                                                    R04
                        3254  *                                                                    R04
001D5AI  C810 8000      3255  MTLOADS  LHI   R1,X'8000'          FOR TARGET CHECK                R04
001D5EI  0A11           3256            AAR   R1,R1              =0000 OR FFFF0000               R04
001D60I  0631           3257            OAR   R3,R1              =0000 OR FFFF00SS               R04
001D62I  D310 0078      3258            LB    R1,X'78'           GET TAPE DEVICE ADDRESS         R04
001D66I  9D19           3259  MTLOADS0  SSR   R1,R9              MAG TAPE STATUS                 R04
001D68I  C390 0010      3260            THI   R9,X'10'           TEST FOR NO MOTION              R04
001D6CI  2233           3261            BZS   MTLOADS0           WAIT FOR IT                     R04
001D6EI  C8F0 A023      3262            LHI   R15,X'A023'        FF COMMANDS                     R04
001D72I  C8E0 C9C0      3263            LHI   R14,X'C9C0'        DISARM COMMANDS                 R04
001D76I  D390 0079      3264            LB    R9,X'79'           GET READ COMMAND                R04
001D7AI  C590 00A1      3265            CLHI  R9,X'A1'           800/1600 BPI?                   R04
001D7EI  2333           3266            BES   MTLOADS1           SKIP IF YES                     R04
001D80I  90F8           3267            SRHLS R15,8              FF COMMAND FOR 6250             R04
001D82I  90E8           3268            SRHLS R14,8              DISARM COMMAND FOR 6250         R04
001D84I  9E1E           3269  MTLOADS1  OCR   R1,R14             DISARM                          R04
001D86I  9E1F           3270            OCR   R1,R15             FORWARD FILE MARK               R04
001D88I  9D19           3271  MTLOAD2   SSR   R1,R9              *                               R04
001D8AI  C390 0010      3272            THI   R9,X'10'           NO MOTION?                      R04
001D8EI  2233           3273            BZS   MTLOAD2            NO, WAIT                        R04
001D90I  0833           3274            LDAR  R3,R3              CHECK HOST                      R04
001D92I  2336           3275            BZS   MTLOAD4            SKIP IF 16 BIT HOST             R04
001D94I  9E1F           3276            OCR   R1,R15             ELSE, ANOTHER FORWARD FILE      R04
001D96I  9D19           3277  MTLOAD3   SSR   R1,R9              *                               R04
001D98I  C390 0010      3278            THI   R9,X'10'           NO MOTION CHECK                 R04
001D9CI  2233           3279            BZS   MTLOAD3            *                               R04
                        3280  *                                  TAPE IS NOW IN POSITION AT THE  R04
                        3281  *                                  BEGINNING OF THE 1ST OR 2ND     R04
                        3282  *                                  PROGRAM, DEPENDING ON THE HOST. R04
                        3283  *                                  NEXT, READ IN THAT PROGRAM'S    R04S
                        3284  *                                  PROGRAM DEFINITION BLOCK (PDB)  R04
                        3285  *                                                                  R04
001D9EI  C850 0270      3286  MTLOAD4   LHI   R5,BOOTEN-MTLOADS+X'100' START ADDRESS             R04
001DA2I  C860 02A3      3287            LHI   R6,BOOTEN-MTLOADS+X'133' END ADDRESS               R04
001DA6I  9E24           3288            OCR   R2,R4              SELCH STOP                      R04
001DA8I  2490           3289            LIS   R9,0               *                               R04
001DAAI  9A39           3290            WDR   R3,R9              MS BYTE OF 3 BYTE START ADRS    R04
001DACI  9825           3291            WHR   R2,R5              LS 2 BYTES OF START ADRS        R04
001DAEI  9A39           3292            WDR   R3,R9              MS BYTE OF 3 BYTE END ADRS      R04
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MAG TAPE BOOT LOADER

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001DB0I  9826                3293           WHR   R2,R6              LS 2 BYTES OF END ADDRESS       R04
001DB2I  DE10 0079           3294           OC    R1,X'79'           START TAPE                      R04
001DB6I  9E20                3295           OCR   R2,R0              SELCH GO                        R04
001DB8I  2145                3296           BOS   MTLOAD5            SKIP IF FALSE SYNC              R04
001DBAI  9D29                3297           SSR   R2,R9              ELSE WAIT FOR SELCH             R04
001DBCI  2081                3298           BTBS  8,1                TO GO NON-BUSY                  R04
001DBEI  9E24                3299           OCR   R2,R4              THEN STOP THE SELCH             R04
001DC0I  230A                3300           BS    MTLOAD6            *                               R04
001DC2I  9D19                3301  MTLOAD5  SSR   R1,R9              MAG TAPE STATUS                 R04
001DC4I  2081                3302           BTBS  8,1                WAIT FOR NON-BUST               R04
001DC6I  DB15 0000           3303           RD    R1,0(R5)           READ                            R04
001DCAI  2651                3304           AIS   R5,1               BUMP INDEX                      R04
001DCCI  0565                3305           CLAR  R6,R5              DONE?                           R04
001DCEI  2286                3306           BNLS  MTLOAD5            NO, LOOP                        R04
001DD0I  9D19                3307           SSR   R1,R9              FINAL STATUS                    R04
001DD2I  2170                3308           BTFS  7,0                HANG ON ERROR                   R04
001DD4I  9D19                3309  MTLOAD6  SSR   R1,R9              TRANSFER COMPLETE               R04
001DD6I  C390 0010           3310           THI   R9,X'10'           WAIT FOR NO MOTION              R04
001DDAI  2233                3311           BZS   MTLOAD6            WAIT FOR NO MOTION              R04
001DDCI  D390 0282           3312           LB    R9,BOOTEN-MTLOADS+X'100'+18 *                      R04
001DE0I  D350 0283           3313           LB    R5,BOOTEN-MTLOADS+X'100'+19 *                      R04
001DE4I  9158                3314           SLHLS R5,8               POSITION BITS 16-23             R04
001DE6I  D360 0284           3315           LB    R6,BOOTEN-MTLOADS+X'100'+20 *                      R04
001DEAI  0656                3316           OAR   R5,R6              (R9,R5)=PROGRAM START ADDRESS   R04
001DECI  0833                3317           LDAR  R3,R3              TEST HOST                       R04
001DEEI  2334                3318           BZS   MTLOAD6A           SKIP IF 16 BIT                  R04
                             3319  *        EXHR  R7,R9              (R7)='00XX0000'                 R04
001DF0I  3479                3320           DCX   3479               *                               R04
001DF2I  0675                3321           OAR   R7,R5              (R7)='00XXYYZZ'                 R04
001DF4I  2302                3322           BS    MTLOAD6B           *                               R04
001DF6I  0875                3323  MTLOAD6A LDAR  R7,R5              SAVE START ADDRESS              R04
001DF8I  0857                3324  MTLOAD6B LDAR  R5,R7              (R5)=START ADDRESS              R04
001DFAI  D3A0 0285           3325           LB    R10,BOOTEN-MTLOADS+X'100'+21 *                     R04
001DFEI  D360 0286           3326           LB    R6,BOOTEN-MTLOADS+X'100'+22 *                      R04
001E02I  9466                3327           EXBR  R6,R6              *                               R04
001E04I  D380 0287           3328           LB    R8,BOOTEN-MTLOADS+X'100'+23 *                      R04
001E08I  0668                3329           OAR   R6,R8              (R10,R6)=LOAD END ADDRESS       R04
001E0AI  0833                3330           LDAR  R3,R3              TEST HOST                       R04
001E0CI  2333                3331           BZS   MTLOAD7            SKIP IF 16 BIT                  R04
                             3332  *        EXHR  R11,R10            (R11)='00XX0000'                R04
001E0EI  34BA                3333           DCX   34BA               *                               R04
001E10I  066B                3334           OAR   R6,R11             (R6)='00XXYYZZ'                 R04
001E12I  0885                3335  MTLOAD7  LDAR  R8,R5              START ADRS                      R04
001E14I  EC80 0010           3336           SRL   R8,16              (R8)=0000 OR 000000XX           R04
001E18I  C8B5 00FF           3337           LHI   R11,255(R5)        START ADDRESS + 255 EQUALS      R04
                             3338  *                                 END ADDRESS FOR THIS RECORD     R04
001E1CI  056B                3339           CLAR  R6,R11             COMPARE TO END ADDRESS          R04
001E1EI  2382                3340           BNLS  MTLOAD7A           SKIP IF NOT LESS                R04
001E20I  08B6                3341           LDAR  R11,R6             IF YES, USE REAL END ADDRESS    R04
001E22I  9E24                3342  MTLOAD7A OCR   R2,R4              SELCH STOP                      R04
001E24I  9A38                3343           WDR   R3,R8              MS BYTE OF ADDRESS              R04
001E26I  9825                3344           WHR   R2,R5              OUTPUT START ADRS               R04
001E28I  9A3A                3345           WDR   R3,R10             *                               R04
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001E2AI  982B           3346           WHR   R2,R11              OUTPUT END ADRS              R04
001E2CI  DE10 0079      3347           OC    R1,X'79'            MAG TAPE START               R04
001E30I  9E20           3348           OCR   R2,R0               SELCH START                  R04
001E32I  2145           3349           BOS   MTLOAD8             SKIP IF FALSE SYNC           R04
001E34I  9D29           3350           SSR   R2,R9               *                            R04
001E36I  2081           3351           BTBS  8,1                 WAIT ON SELCH BUSY           R04
001E38I  9E24           3352           OCR   R2,R4               SELCH STOP                   R04
001E3AI  2308           3353           BS    MTLOAD9             *                            R04
001E3CI  9D19           3354  MTLOAD8  SSR   R1,R9               MAG TAPE STATUS              R04
001E3EI  2081           3355           BTBS  8,1                 LOOP ON BUSY                 R04
001E40I  DB15 0000      3356           RD    R1,0(R5)            READ BYTES                   R04
001E44I  2651           3357           AIS   R5,1                BUMP ADDRESS                 R04
001E46I  0585           3358           CLAR  R11,R5              DONE CHECK                   R04
001E48I  2286           3359           BNLS  MTLOAD8             LOOP ON RECORD               R04
001E4AI  D390 0079      3360  MTLOAD9  LB    R9,X'79'            GET READ COMMAND             R04
001E4EI  C590 00A1      3361           CLHI  R9,X'A1'            800/1600 BPI?                R04
001E52I  2334           3362           BES   MTLOAD9B            SKIP IF YES                  R04
001E54I  9D19           3363  MTLOAD9A SSR   R1,R9               6250 STATUS                  R04
001E56I  212D           3364           BTCS  2,MTLOAD10          DONE IF EOF                  R04
001E58I  2305           3365           BS    MTLOAD9C            ELSE KEEP READING            R04
001E5AI  9D19           3366  MTLOAD9B SSR   R1,R9               *                            R04
001E5CI  C390 0040      3367           THI   R9,X'40'            EOF?                         R04
001E60I  2138           3368           BNZS  MTLOAD10            DONE IF YES                  R04
001E62I  9095           3369  MTLOAD9C SRHLS R9,5                NO MOTION CHECK              R04
001E64I  228D           3370           BNCS  MTLOAD9             WAIT FOR IT                  R04
001E66I  C85B 0001      3371           LHI   R5,1(R11)           NEXT START ADRS              R04
001E6AI  0556           3372           CLAR  R5,R6               COMPARE TO END ADDRESS       R04
001E6CI  4280 01B8      3373           BL    MTLOAD7-MTLOADS+X'100' LOOP                      R04
001E70I  0857           3374  MTLOAD10 LDAR  R5,R7               START ADDRESS                R04
                        3375  *                                  (R6)=END ADDRESS             R04
001E72I  24A0           3376           LIS   R10,0               CHECKSUM ACCUMULATOR         R04
001E74I  D387 0000      3377  MTLOAD11 LB    R11,0(R7)           *                            R04
001E78I  07AB           3378           XAR   R10,R11             CALCULATE CHECKSUM           R04
001E7AI  2671           3379           AIS   R7,1                *                            R04
001E7CI  0567           3380           CLAR  R6,R7               *                            R04
001E7EI  2285           3381           BNLS  MTLOAD11            *                            R04
001E80I  9D19           3382  MTLOAD12 SSR   R1,R9               *                            R04
001E82I  C390 0010      3383           THI   R9,X'10'            NO MOTION CHECK              R04
001E86I  2233           3384           BZS   MTLOAD12            *                            R04
001E88I  C870 0038      3385           LHI   R7,X'38'            *                            R04
001E8CI  D390 0079      3386           LB    R9,X'79'            GET READ COMMAND             R04
001E90I  C590 00A1      3387           CLHI  R9,X'A1'            800/1600 BPI?                R04
001E94I  2333           3388           BES   MTLOAD13            SKIP IF YES                  R04
001E96I  C870 00E0      3389           LHI   R7,X'E0'            RW COMMAND FOR 6250          R04
001E9AI  9E17           3390  MTLOAD13 OCR   R1,R7               REWIND THE TAPE              R04
001E9CI  9D19           3391  MTLOAD14 SSR   R1,R9               *                            R04
001E9EI  C390 0010      3392           THI   R9,X'10'            NO MOTION CHECK              R04
001EA2I  2233           3393           BZS   MTLOAD14            *                            R04
001EA4I  D370 0288      3394           LB    R7,BOOTFN-MTLOADS+X'100'+24 *                    R04
001EA8I  057A           3395           CLAR  R7,R10              CHECK CHECKSUM               R04
001EAAI  0335           3396           BER   R5                  GO IF OK                     R04
001EACI  C810 00EE      3397           LHI   R1,X'EE'            *                            R04
001EB0I  24A1           3398           LIS   R10,1               *                            R04
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MAG TAPE BOOT LOADER

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001EB2I  C8B0 0040          3399            LHI   R11,X'40'       *                              R04
001EB6I  9EAB               3400            OCR   R10,R11         DISPLAY IN INCREMENTAL MODE    R04
001EB8I  9AA1               3401            WDR   R10,R1          *                              R04
001EBAI  24E0               3402            LIS   R14,0           *                              R04
001EBCI  9AAE               3403            WDR   R10,R14         *                              R04
001EBEI  9AAE               3404            WDR   R10,R14         *                              R04
001EC0I  9AAE               3405            WDR   R10,R14         *                              R04
001EC2I  C8B0 0080          3406            LHI   R11,X'80'       *                              R04
001EC6I  9EAB               3407            OCR   R10,R11         NORMAL MODE                    R04
001EC8I  2200               3408            BS    *               HANG ON CHECKSUM ERROR         R04
         0000 1EC9I         3409  MTLOADE   EQU   *-1             *                              R04
         0000 1ECAI         3410  BOOTEN    EQU   *                                              MDG33830
                            3411            SQUEZ
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                        3413  *                                                    MDG33850
                        3414  *                                                    MDG33860
                        3415  *                                                    MDG33870
001ECCI                 3416        ALIGN 4                                        MDG33880
001ECCI  0000           3417  LOW   DC    X'0000',X'0000'                         MDG33890
001ECEI  0000
                        3418  *                                                    MDG33900
001ED0I                 3419        ALIGN 4                                        MDG33910
001ED0I  0000           3420  HIGH  DC    X'0000',X'0000'                         MDG33920
001ED2I  0000
                        3421  *                                                    MDG33930
001ED8I                 3422        ALIGN 8                                        MDG33940
001ED8I  0000           3423  OUTDEV DC   X'0000',X'0000'                         MDG33950
001EDAI  0000
001EDCI  0000           3424        DC    X'0000',X'0000'                         MDG33960
001EDEI  0000
                        3425  *                                                    MDG33970
001EE0I                 3426        ALIGN 8                                        MDG33980
001EE0I  0000           3427  INDEV DC    X'0000',X'0000'                         MDG33990
001EE2I  0000
001EE4I  0000           3428        DC    X'0000',X'0000'                         MDG34000
001EE6I  0000
                        3429  *                                                    MDG34010
001EE8I                 3430        ALIGN 4                                        MDG34020
001EE8I  FFFF           3431  PGMOPN DC   X'FFFF'                                 MDG34030
001EEAI  FFFF           3432        DC    X'FFFF'                                 MDG34040
001EECI  FFFF           3433  PGMIPN DC   X'FFFF'                                 MDG34050
001EEEI  FFFF           3434        DC    X'FFFF'                                 MDG34060
         0000 1EEFI     3435  LNZB  EQU   *-1                                     MDG34070
                        3436  *                                                    MDG34080
001EF0I                 3437        ALIGN 8                                        MDG34090
001EF0I                 3438  INBUF DS    50                                      MDG34100
                        3439  *                                                    MDG34110
001F28I                 3440        ALIGN 8                                        MDG34120
001F28I                 3441  CMD   DS    8                                       MDG34130
                        3442  *                                                    MDG34140
001F30I                 3443  FFBUF DS    51                                      MDG34150
001F68I                 3444        ALIGN 8                                        MDG34160
001F68I                 3445  PDB   DS    51                                      MDG34170
         0000 1F68I     3446  SEQNAM EQU  PDB                                     MDG34180
001F9CI                 3447        ALIGN 4                                        MDG34190
001F9CI                 3448  WRTBUF DS   256                                     MDG34200
00209CI                 3449  DIRPRM DS   8                                       MDG34210
0020A4I                 3450  NXTPRM DS   8                                       MDG34220
0020ACI                 3451  DIRECT DS   256                                     MDG34230
0021ACI                 3452        ALIGN 4                                        MDG34240
0021ACI                 3453  DCOPY DS    8                                       MDG34250
0021B4I                 3454  ADDRES DS   4                                       MDG34260
0021B8I                 3455  FADD  DS    4                                       MDG34270
0021BCI                 3456  WRTEND DS   4                                       MDG34280
0021C0I                 3457  PGMNUM DS   4                                       MDG34290
0021C4I                 3458  TRKDEN DS   4                                       MDG34300
0021C8I                 3459  MAXCYL DS   4                                       MDG34310
0021CCI                 3460  MISTRN DS   4                                       MDG34320
0021D0I                 3461  UPDTRN DS   4                                       MDG34330
```

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0021D4I          3462  CPYFLG    DS     4                                  MDG34340
0021D8I          3463  DTDONE    DS     4                                  MDG34350
0021DCI          3464  STADD     DS     4                                  MDG34360
0021E0I          3465  EOVRTN    DS     4                                  MDG34370
0021E4I          3466  AVARTN    DS     4                                  MDG34380
0021E8I          3467  DIRPRN    DS     4                                  MDG34390
0021ECI          3468  DIRTN     DS     4                                  MDG34400
0021F0I          3469  PGMUPN    DS     4                                  MDG34410
0021F4I          3470  CONSTA    DS     2                                  MDG34420
0021F6I          3471  FFBFFL    DS     2                                  MDG34430
0021F8I          3472  MTCMD     DS     2                                  MDG34440
0021FAI          3473  BKSPFL    DS     2                                  MDG34450
0021FCI          3474  SCRAP     DS     2                                  MDG34460
0021FEI          3475  IOFLAG    DS     2                                  MDG34470
002200I          3476  CYL       DS     2                                  MDG34480
002202I          3477  HEAD      DS     2                                  MDG34490
002204I          3478  DISCMD    DS     2                                  MDG34500
002206I          3479  SELIND    DS     2                                  MDG34510
002208I          3480  SELERR    DS     2                                  MDG34520
00220AI          3481  EOJFLG    DS     2                                  MDG34530
00220CI          3482  RETRY     DS     2                                  MDG34540
00220EI          3483  CUTRKDEN  DS     2                                  MDG34550
002210I          3484  CUMAXCYL  DS     2                                  MDG34560
002212I          3485  INTADD    DS     2                                  MDG34570
002214I          3486  COPSEC    DS     2                                  MDG34580
002216I          3487  LSTBLK    DS     2       LAST COPY BLOCK LENGTH     MDG34590
002218I          3488  NUMBLK    DS     2       NUMBER OF FULL BLOCKS      MDG34600
00221AI          3489  CURBLK    DS     2       CURRENT BLOCK SIZE         MDG34610
00221CI          3490  RWDEV     DS     2                                  MDG34620
00221EI          3491  UPDFLG    DS     2                                  MDG34630
002220I          3492  AVAFLG    DS     2                                  MDG34640
002224I          3493            ALIGN  4                                  MDG34650
002224I          3494  DIMOST    DS     6                                  MDG34660
00222AI          3495  DIDOIN    DS     6                                  MDG34670
002230I          3496  DIDOOU    DS     6                                  MDG34680
002236I          3497            IFNZ   ADC-2                              MDG34690
002238I          3498            ALIGN  8                                  MDG34700
                 3499            ENDC                                      MDG34710
002238I          3500  OLDPSW    DS     8                                  MDG34720
002240I          3501  REGSAV    DS     512                                MDG34730
                 3502  *                                                   MDG34740
002440I          3503            END                                       MDG34750
```

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

START OPTIONS: T=32,ERLST

NO CAL ERRORS
NO CAL WARNINGS
6 PASSES

TABLE SPACE USED : 16K

```
CHKCMD    0000 032AI    354    357*
CHKI01    0000 0314I    337    351*
CHKIOF    0000 02DCI    306    334*
CLEAR     0000 18R4I    505    677   2545*  2546
CLIF2ND   0000 0036I     62*
CLIFADR   0000 0016I     39*
CLIFRD    0000 0034I     61*
CMD       0000 1F28I    150    151    152    154    160    169    172    175   3441*
CMDAA     0000 0148I    157    159    165*
CMDAA1    0000 014AI    166*   170    173    176
CMDAB     0000 012EI    155*   162
CON2ND    0000 002CI     57*    91   2594
CONCMD    0000 002EI     58*    86     88     90
CONDS1    0000 1738I   2328   2333*
CONDS3    0000 173CI   2335*
CONMT1    0000 1634I   2226*  2229
CONMT9    0000 164EI   2231   2234*
CONMTX    0000 1634I   2217   2221   2225*
CONRADR   0000 0026I     53*    85    118   2593   2598
CONRD     0000 002AI     55*    56     89    119   2599
CONRQ2S   0000 0044I     69*
CONSTA    0000 21F4I   1408   1788   2337   2871   3470*
CONT4B    0000 15D6I   2171*
CONT4C    0000 15DAI   2175*
CONT5A    0000 1610I   2201   2204*
CONT5B    0000 1618I   2144   2158   2162   2207   2213*
CONTDS    0000 1730I   2323   2325*
CONWADR   0000 0028I     54*    83    124   2618
CONWRT    0000 002BI     56*    87     95    125   2619
COPDVE    0000 0AF0I   1138   1140*  1287
COPMTI    0000 089EI    933*  1018
COPSEC    0000 2214I    974   1010   1016   3486*
COPY      0000 0712I    205    809*
COPY1     0000 0792I    827    844*   943    947   1226
COPY2     0000 07A4I    847    850*
COPYA     0000 0740I    813    823*
COPYEV    0000 0760I    818    831*
CPYFLG    0000 21D4I    971   1256   1495   1644   3462*
CPYMOR    0000 0714I    811*   822    843
CREA      0000 0F40I    200   1493*
CREA1     0000 0F64I   1500   1504*
CREA3     0000 0F6EI   1507*  1527
CREA4     0000 108AI   1595   1598*
CREA6     0000 108CI   1599*  1612   1623
CREAER    0000 1150I   1498   1503   1656*
CREAXY    0000 10AEI   1604   1609*
CRECHK    0000 0FAAI   1524   1528*
CREDIS    0000 103CI    972   1257   1553   1575*
CRLF      0000 18BCI    103    542   2276   2557*  2662   2695   3102   3127   3192
CRT2ND    0000 0032I     60*
CRTRD     0000 0030I     59*
CRTRQ2S   0000 0045I     70*
CUMAXCYL  0000 2210I   1649   1651   3484*
CURBLK    0000 221AI    893    918    984   1008   1128   1234   1277   1302   3489*
CUTRKDEN  0000 220EI   1179   1614   1719   1783   2284   2414   2469   2777   3483*
```

G032	0000 1AE2I	2963*	3000											
HDTAB	0000 0572I	591	606*	1185	1423	1626	1730	1795	1825	1941	1977			
HEAD	0000 2202I	555	589	1142	1148	1184	1188	1250	1259	1267	1290	1297	1308	1314
		1329	1335	1404	1422	1425	1427	1438	1587	1625	1629	1632	1638	1668
		1672	1729	1733	1794	1798	1810	1824	1828	1840	1905	1940	1944	1976
		1980	1987	1999	2011	2288	2296	2780	2844	2852	3477*			
HIGH	0000 1ED0I	256	265	1526	1533	1567	1647	3420*						
HIPRT	0000 0224I	245	253*											
IDEVDU	0000 1C7CI	3136	3139*											
IDWT	0000 0DF4I	1386*	1388											
ILLADD	0000 1A2EI	2817	2822*											
ILLIST	0000 1BAEI	2969	3046*											
IMPTOP	0000 2440I	3503												
IN	0000 033CI	197	387*											
INBUF	0000 1EF0I	114	136	185	2658	3438*								
INDEV	0000 1EE0I	388	846	2436	2449	2457	2464	2470	3427*					
INIT	0000 0DD8I	206	1378*											
INIT32	0000 1B68I	2962	2999*											
INITSK	0000 0E22I	1400*	1434											
INITZF	0000 0E1AI	1398*	1399											
INNAME	0000 018CI	167	171	174	178	179	196*	196	197	198	199	200	201	202
		203	204	205	206									
INTADD	0000 2212I	2888	2911	3485*										
INTAPE	0000 0EE8I	1380	1455*											
INTCOM	0000 1B70I	2996	3025*											
INTER	0000 1C0EI	3036	3091*											
INTP1	0000 0EF8I	1458	1461*											
IO	0000 0010I	36*	80	82	84									
IOFLAG	0000 21FEI	494	573	3475*										
IOFUN2	0000 028CI	322*												
IOVQU	0000 1BFCI	2987	3085*											
ISAF	0000 1C82I	3158	3162*											
ISHXCO	0000 1C8CI	246	310	326	471	722	743	750	819	1082	1086	1090	3151*	
ISNUM	0000 1CACI	3154	3160*	3163										
JABT	0000 1C60I	3128	3132*											
LADC	0000 0002													
LCORE	0000 1ADEI	33	2957*											
LID1	0000 1808I	2437	2440*											
LID1A	0000 1818I	2442	2445*											
LID2	0000 1826I	2446	2449*											
LID3	0000 1840I	2450	2454	2457*										
LID4	0000 1856I	2458	2461	2464*										
LID5	0000 1864I	2465	2468*											
LIDAD	0000 17FAI	501	664	828	851	869	884	934	964	975	1104	1119	1204	1243
		1263	1337	1860	2436*									
LIMITS	0000 01E6I	198	229*											
LINK	0000 000F	32*	2578	2584	2586	2614	2633							
LNZB	0000 1EEFI	3435*												
LOD1	0000 1790I	2382	2385*											
LOD1A	0000 17A0I	2387	2390*											
LOD2	0000 17AEI	2391	2394*											
LOD3	0000 17C8I	2395	2399	2402*										
LOD4	0000 17DEI	2403	2406	2409*										
LOD5	0000 17ECI	2410	2413*											
LODAD	0000 1782I	498	625	631	670	845	854	859	875	914	926	1005	1015	1110

		1195	1231	1254	1299	1312	1378	1550	1554	1579	1894	2381*
LOFRHI	0000 0A04I	1040	1041	1061*								
LOHI	0000 01ECI	232*	257									
LOHI1	0000 01F4I	239*	251									
LOHIEN	0000 0234I	243	258*									
LOHIK1	0000 09DCI	1046	1048*									
LOHIK2	0000 0A0EI	1064	1066*									
LOKIN	0000 19B8I	98	500	684	958	1227	2720*					
LOKOUT	0000 19C4I	97	497	635	641	686	1202	1451	1478	1572	1665	2740*
LOW	0000 1ECCI	230	260	263	264	1506	1529	1566	1646	3417*		
LPADR	0000 001AI	41*										
LPWRT	0000 0038I	63*										
LSTBLK	0000 2216I	898	902	989	993	1048	1066	1132	1136	1281	1285	3487*
MACINT	0000 1C02I	2990	3087*									
MAXCYL	0000 21C8I	349	3459*									
MCH1	0000 18D8I	3066	3070*									
MCHMAL	0000 1BB6I	2972	3049*									
MCHPSW	0000 1BD0I	3053	3063*									
MICROBUS	0000 0022I	45*										
MIDO	0000 0904I	862	961*									
MIDO1	0000 098AI	987	1004*									
MIDO11	0000 092EI	970	973*	1012								
MIDO2X	0000 0952I	984*	994									
MIDOEN	0000 09A6I	999	1014*									
MIDOER	0000 0982I	894	985	1001*								
MIDOFM	0000 087AI	967	1013*									
MIDOLB	0000 0962I	979	988*									
MIDONL	0000 0972I	990	995*									
MIMO	0000 07CCI	861	863*									
MIMO1	0000 0862I	896	913*									
MIMO2X	0000 082AI	893*	903									
MIMOEN	0000 0882I	908	925*									
MIMOER	0000 085AI	910*										
MIMOEV	0000 08ECI	937	954*									
MIMOFM	0000 087AI	872	922*	1013								
MIMOLB	0000 083AI	888	897*									
MIMONL	0000 084AI	899	904*									
MIMONX	0000 080AI	884*	921									
MISTRN	0000 21CCI	1036	1096	3460*								
MISTRT	0000 09B6I	874	969	1035*	1109	1248						
MREADC	0000 0040I	67*										
MTBOOT	0000 1D06I	1472	1473	3204*	3235							
MTBOOT1	0000 1D16I	3210*	3213									
MTBOOT2	0000 1D46I	3227	3232*	3235								
MTCMD	0000 21F8I	2112	2126	2182	2214	2244	3472*					
MTCOM	0000 154AI	2110	2112*									
MTEND	0000 16A2I	2238	2264*									
MTERR	0000 165CI	2108	2236	2240*	2243							
MTERR1	0000 168CI	2254	2257*									
MTERRB	0000 15C2I	2143	2157	2160*								
MTERRW	0000 167EI	2247	2250	2253*								
MTIN	0000 07BEI	853	858*									
MTLOAD10	0000 1E70I	3364	3368	3374*								
MTLOAD11	0000 1E74I	3377*	3381									
MTLOAD12	0000 1E80I	3382*	3384									

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MTLOAD13  0000 1E9AI    3388   3390*
MTLOAD14  0000 1E9CI    3391*  3393
MTLOAD2   0000 1D88I    3271*  3273
MTLOAD3   0000 1D96I    3277*  3279
MTLOAD4   0000 1D9EI    3275   3286*
MTLOAD5   0000 1DC2I    3296   3301*  3306
MTLOAD6   0000 1DD4I    3300   3309*  3311
MTLOAD6A  0000 1DF6I    3318   3323*
MTLOAD6B  0000 1DF8I    3322   3324*
MTLOAD7   0000 1E12I    3331   3335*  3373
MTLOAD7A  0000 1E22I    3340   3342*
MTLOAD8   0000 1E3CI    3349   3354*  3359
MTLOAD9   0000 1E4AI    3353   3360*  3370
MTLOAD9A  0000 1E54I    3363*
MTLOAD9B  0000 1E5AI    3362   3366*
MTLOAD9C  0000 1E62I    3365   3369*
MTLOADE   0000 1EC9I    1476   3216   3409*
MTLOADS   0000 1D5AI    1475   3216   3255*  3286  3287  3312  3313  3315  3325  3326  3328  3373  3394
MTLOADS0  0000 1D66I    3259*  3261
MTLOADS1  0000 1D84I    3266   3269*
MTRB      0000 15A8I    2148*  2153
MTREAD    0000 18B7I    2111   2127   2183  2215  2245  2549*
MTRY      0000 1566I    2122*  2262
MTWB      0000 1586I    2134*  2139
MTWRT     0000 18A8I    2109   2527*  2528
NEDNW1    0000 123AI    1721   1729*
NEEDNW    0000 11F4I    1688   1707*
NOECHO1   0000 00F4I     132    134*
NOEOJ     0000 1C38I    3107   3109*
NOMO1     0000 189EI    2509   2515*
NOMORE    0000 1890I    2498   2499   2507*
NOMOTN    0000 1980I     510    523    537   539   638   640   678   680   928   930   932   940   955
                         957   1197   1199  1201  1469  1471  2259  2261  2270  2272  2274  2680*  2683
NORUN     0000 162CI    1468   2222*
NOT3200   0000 18C8I    3051   3055*
NUMBLK    0000 2218I     887    891    978   982  1059  1076  1122  1126  1271  1275  3488*
NUMTHERE  0000 1266I    1608   1742*
NXDR1     0000 10D6I    1622*
NXDRHD    0000 10DCI    1616   1625*
NXREA1    0000 10C4I    1617*  1631
NXTDIR    0000 10B8I    1613*
NXTPRM    0000 20A4I    1667   1669   1670  1689  1691  1693  3450*
OLDPSW    0000 2238I    2980   3500*
OTC.0     0000 18F6I    2595   2597*  2604  2613  2615
OTC.1     0000 1904I    2603*
OTC.2     0000 190EI    2602   2606*
OTC.3     0000 1920I    2609   2612*
OTC.4     0000 193CI    2621*  2626
OTC.5     0000 194EI    2628*  2630
OUIN      0000 026EI     300*   319    333
OUIN1     0000 0294I     308    310*
OUIN2     0000 02A8I     314    316*
OUINA     0000 025AI     292*   389
OUINFL    0000 02B4I     304    320*
OUINL     0000 0262I     296*   299
```

		3162 3176 3178 3180 3181 3182 3186 3189 3217 3226 3295 3348
R1	0000 0001	17* 80 81 82 84 86 88 90 149 150 151 152 153
		153 154 160 161 503 513 573 629 632 671 825 826 829
		852 855 860 872 876 877 879 894 901 901 902 908 910
		923 937 967 985 992 992 993 999 1001 1111 1112 1114 1135
		1135 1136 1176 1284 1284 1285 1379 1386 1387 1389 1390 1395 1398
		1399 1429 1430 1432 1433 1435 1436 1442 1443 1444 1445 1446 1453
		1456 1457 1459 1466 1467 1555 1556 1558 1596 1806 1836 1864 1918
		1925 1926 1948 1951 1953 1954 1955 1959 1968 1969 2108 2114 2115
		2116 2132 2140 2146 2154 2160 2161 2183 2184 2215 2216 2219 2220
		2222 2226 2228 2230 2232 2235 2241 2242 2248 2249 2255 2281 2288
		2289 2291 2292 2296 2297 2298 2299 2302 2303 2306 2307 2335 2337
		2338 2340 2344 2354 2385 2386 2388 2390 2392 2397 2398 2400 2404
		2405 2407 2409 2413 2414 2415 2440 2441 2443 2445 2447 2452 2453
		2455 2459 2460 2462 2464 2468 2469 2470 2594 2596 2599 2600 2601
		2603 2606 2607 2608 2610 2612 2617 2619 2620 2621 2623 2625 2629
		2656 2658 2659 2680 2682 2687 2689 2691 2721 2722 2723 2741 2742
		2743 2760 2761 2762 2777 2778 2782 2786 2791 2809 2811 2816 2818
		2822 2869 2871 2887 2888 2889 2890 2891 2969 2970 2972 2973 2977
		2978 2980 2981 2982 2983 2984 2985 2987 2988 2990 2991 2994 2995
		3026 3027 3028 3029 3032 3033 3034 3037 3038 3039 3137 3139 3142
		3182 3183 3188 3190 3204 3210 3225 3232 3234 3255 3256 3256 3257
		3258 3259 3269 3270 3271 3276 3277 3294 3301 3305 3307 3309 3347
		3354 3356 3363 3366 3382 3390 3391 3397 3401
R10	0000 000A	3198* 3325 3345 3376 3378 3395 3398 3400 3401 3403 3404 3405 3407
R11	0000 000B	3199* 3334 3337 3339 3341 3346 3358 3371 3377 3378 3399 3400 3406
		3407
R14	0000 000E	3200* 3263 3268 3269 3402 3403 3404 3405
R15	0000 000F	3201* 3262 3267 3270 3276
R2	0000 0002	18* 82 83 84 85 94 96 100 105 106 108 112 112
		114 115 116 118 120 121 123 124 126 127 129 165 166
		167 171 174 178 184 185 232 232 233 247 248 249 323
		323 327 328 329 543 561 561 563 568 582 583 705 705
		707 708 709 769 769 770 771 772 1151 1152 1153 1155 1164
		1165 1169 1173 1182 1182 1189 1189 1192 1205 1206 1208 1212 1222
		1224 1316 1317 1396 1422 1423 1530 1531 1535 1536 1598 1598 1599
		1605 1610 1611 1622 1625 1626 1628 1629 1635 1637 1639 1640 1674
		1675 1676 1677 1686 1687 1690 1692 1694 1727 1729 1730 1732 1733
		1740 1771 1772 1776 1777 1861 1862 1891 1892 1920 1920 1921 1924
		1928 1929 1940 1941 1943 1944 1954 1955 1956 1957 1959 1960 1967
		1969 1970 1971 1991 1998 1999 2000 2001 2007 2008 2010 2012 2097
		2099 2100 2109 2111 2112 2127 2128 2133 2141 2147 2155 2167 2169
		2179 2182 2184 2186 2193 2200 2214 2216 2244 2246 2277 2301 2303
		2309 2316 2322 2558 2577 2581 2663 2696 2892 2912 3103 3128 3184
		3186 3187 3193 3205 3207 3208 3219 3222 3224 3226 3228 3230 3288
		3291 3293 3295 3297 3299 3342 3344 3346 3348 3350 3352
R3	0000 0003	19* 86 87 88 89 90 91 92 92 94 95 96 97
		98 99 101 109 113 114 119 120 121 125 126 127 155
		185 239 246 300 310 325 326 417 447 448 451 459 463
		471 477 479 480 482 497 498 500 501 506 514 515 516
		518 520 540 544 551 553 554 555 559 560 562 565 567
		569 571 575 578 593 625 626 627 631 634 635 641 660
		664 670 684 686 712 722 728 739 743 745 750 756 811
		819 828 833 834 836 845 851 854 859 869 873 874 875
		883 884 887 890 891 892 893 895 898 900 909 914 918

		919	920	926	934	938	941	942	944	946	948	949	950	951
		952	958	959	964	968	969	970	971	975	978	981	982	983
		984	986	989	991	1000	1005	1008	1009	1011	1015	1017	1036	1043
		1044	1045	1047	1048	1051	1052	1055	1056	1069	1070	1073	1074	1082
		1086	1090	1096	1097	1103	1104	1105	1108	1109	1110	1118	1119	1122
		1125	1126	1127	1128	1129	1132	1134	1138	1140	1147	1148	1149	1150
		1156	1157	1159	1162	1163	1165	1166	1168	1170	1172	1174	1184	1185
		1187	1188	1193	1194	1195	1202	1204	1208	1210	1212	1214	1216	1217
		1219	1222	1223	1224	1225	1227	1228	1231	1234	1235	1236	1242	1243
		1244	1247	1248	1254	1255	1256	1263	1271	1274	1275	1276	1277	1278
		1281	1283	1287	1299	1302	1303	1304	1312	1313	1314	1318	1319	1321
		1324	1325	1331	1337	1338	1339	1341	1344	1345	1378	1385	1385	1391
		1393	1397	1400	1402	1403	1404	1406	1407	1408	1409	1414	1415	1417
		1419	1423	1439	1441	1447	1448	1449	1450	1451	1474	1477	1478	1494
		1495	1504	1512	1513	1517	1518	1521	1522	1537	1538	1540	1544	1546
		1547	1550	1554	1565	1568	1569	1572	1573	1578	1579	1580	1581	1583
		1585	1586	1587	1591	1592	1593	1594	1599	1600	1603	1605	1607	1614
		1615	1620	1621	1626	1632	1633	1643	1644	1645	1648	1650	1653	1654
		1664	1665	1666	1667	1668	1669	1671	1672	1678	1679	1681	1682	1684
		1685	1696	1697	1699	1703	1704	1705	1706	1708	1709	1711	1715	1716
		1719	1720	1725	1726	1730	1738	1739	1779	1780	1782	1786	1787	1788
		1789	1794	1795	1797	1798	1801	1802	1803	1808	1813	1815	1816	1818
		1819	1824	1825	1827	1828	1831	1832	1833	1838	1841	1842	1859	1860
		1867	1868	1869	1870	1871	1872	1890	1893	1894	1895	1896	1897	1898
		1899	1900	1902	1903	1904	1905	1907	1909	1913	1914	1915	1916	1921
		1922	1924	1926	1937	1938	1965	1966	1976	1977	1979	1980	1983	1984
		1996	2005	2006	2013	2014	2101	2102	2103	2104	2105	2113	2117	2118
		2124	2125	2126	2128	2131	2145	2168	2173	2237	2245	2246	2251	2252
		2253	2257	2258	2265	2266	2278	2283	2284	2285	2333	2342	2346	2347
		2349	2350	2351	2416	2471	2505	2512	2519	2559	2587	2660	2697	2724
		2744	2763	2788	2793	2815	2838	2842	2844	2845	2847	2848	2850	2851
		2852	2853	2854	2855	2857	2859	2860	2873	3025	3027	3104	3129	3161
		3187	3188	3194	3206	3207	3220	3223	3257	3274	3274	3290	3292	3317
		3317	3330	3330	3343	3345								
R4	0000 0004	20*	79	79	110	110	111	136	142	143	178	179	181	181
		183	230	233	249	256	291	293	294	298	316	322	329	388
		418	419	449	450	519	520	563	565	568	569	572	576	579
		586	587	590	591	596	623	624	658	659	864	865	945	946
		962	963	1101	1102	1169	1170	1173	1174	1179	1180	1185	1213	1214
		1218	1240	1241	1381	1382	1462	1463	1507	1508	1509	1510	1511	1512
		1514	1515	1516	1517	1519	1520	1521	1529	1530	1532	1533	1535	1540
		1541	1545	1546	1561	1562	1570	1570	1576	1577	1649	1651	1677	1679
		1680	1682	1683	1685	1689	1690	1691	1692	1693	1694	1783	1784	1792
		1795	1803	1821	1825	1833	1873	1901	1932	1941	1974	1977	2504	2507
		2577	2579	2583	2585	2627	2911	2912	2917	2920	3105	3218	3219	3230
		3288	3299	3342	3352									
R5	0000 0005	21*	123	129	130	131	133	134	136	137	139	235	250	292
		307	317	320	332	334	338	351	355	462	466	472	473	475
		488	492	511	556	557	711	719	723	724	726	737	747	751
		752	754	759	761	763	764	766	810	814	820	821	823	831
		842	870	881	885	886	905	906	915	916	935	965	976	977
		996	997	1006	1007	1037	1039	1042	1044	1049	1050	1052	1058	1062
		1067	1068	1070	1075	1078	1080	1088	1091	1093	1094	1095	1106	1116
		1120	1121	1160	1232	1233	1245	1269	1270	1300	1301	1322	1342	1411
		1412	1472	1475	1505	1523	1525	1528	1531	1536	1537	1539	1543	1548

		1563 1588 1589 1602 1603 1606 1607 1617 1618 1641 1700 1701 1712
		1713 1722 1723 1735 1736 1910 1911 1934 1935 1962 1963 2002 2003
		2132 2136 2137 2138 2140 2146 2150 2151 2152 2154 2167 2171 2176
		2494 2496 2500 2502 2510 2515 2516 3214 3222 3231 3234 3235 3286
		3291 3303 3304 3305 3313 3314 3316 3321 3323 3324 3335 3337 3344
		3356 3357 3358 3371 3372 3374 3396
R6	0000 0006	22* 324 330 512 557 558 871 882 886 889 900 906 907
		916 919 936 966 977 980 991 997 998 1007 1009 1038 1039
		1042 1053 1054 1056 1057 1058 1059 1062 1063 1065 1066 1071 1072
		1074 1075 1076 1079 1079 1083 1084 1087 1088 1107 1117 1121 1124
		1134 1161 1233 1235 1246 1270 1273 1283 1301 1303 1323 1343 1412
		1413 1473 1476 1564 1589 1590 1618 1619 1642 1701 1702 1713 1714
		1723 1724 1736 1737 1911 1912 1935 1936 1963 1964 2003 2004 2133
		2138 2141 2147 2152 2155 2168 2175 2177 2495 2496 2497 2502 2503
		2508 2511 2516 2517 2916 2917 2918 2918 2921 2923 3215 3287 3293
		3305 3315 3316 3326 3327 3327 3329 3334 3339 3341 3372 3380
R7	0000 0007	23* 294 296 297 298 318 336 346 346 347 348 353 468
		469 472 721 723 740 741 742 744 749 751 816 817 820
		2290 2291 2293 2839 2840 2846 2847 2919 2920 2921 2922 2923 3216
		3224 3321 3323 3324 3374 3377 3379 3380 3385 3389 3390 3394 3395
R8	0000 0008	24* 295 295 296 548 549 550 550 585 587 589 591 594
		594 974 1010 1016 1141 1142 1143 1144 1145 1146 1178 1180 1190
		1190 1249 1250 1251 1252 1253 1258 1259 1260 1261 1262 1264 1265
		1266 1267 1268 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298
		1307 1308 1309 1310 1311 1315 1326 1327 1328 1329 1330 1332 1333
		1334 1335 1336 1405 1405 1418 1419 1437 1437 1438 1582 1582 1613
		1615 1630 1630 1634 1635 1636 1637 1638 1639 1670 1673 1718 1720
		1734 1734 1784 1791 1792 1799 1799 1809 1809 1810 1820 1821 1829
		1829 1839 1839 1840 1906 1906 1931 1932 1945 1945 1973 1974 1981
		1981 1986 1987 1988 1989 1990 1997 2008 2009 2010 2011 2012 2287
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R9	0000 0009	25* 347 349 3210 3211 3220 3223 3228 3232 3259 3260 3264 3265
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		3392
RA	0000 000A	26* 452 455 494 495 495 502 505 509 522 529 533 538
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		1466 1470 1555 1584 1698 1710 1781 1908 2120 2131 2134 2136 2142
		2145 2148 2150 2156 2186 2193 2219 2226 2241 2248 2260 2269 2271
		2273 2306 2335 2381 2385 2436 2440 2680 2687 2780 2781 2784 2785
		2789 2790 2811 3049 3049 3055 3055 3135 3176
RB	0000 000B	27* 674 674 676 1383 2122 2122 2165 2169 2171 2173 2175 2188
		2195 2311 2318 2394 2396 2397 2449 2451 2452 2887 2914 3178
RC	0000 000C	28* 1384 2281 2287 2292 2293 2299 2309 2316 2402 2404 2457 2459
		2782 2786 2791 2809 2843 2848 2855 2856 2869 2872 3180
RCHECK	0000 18B2I	2542* 2543 2856
RCHK	0000 1A36I	1407 1787 2838*
RCHK1	0000 1A5AI	2841 2850*
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RCHK3	0000 1A6CI	2849 2856*
RD	0000 000D	29* 1551 1552 1566 1646 2494 2500 2501 2510 2515
RDISC	0000 151AI	560 1163 1325 1345 1592 1621 1726 1739 1816 1914 1938 2006 2097*
RE	0000 000E	30* 103 231 253 253 255 258 258 542 1567 1647 2276 2495
		2511 2560 2662 2695 3102 3127 3192

			1444	1445	1446	1448	3448*						
WRTEND	0000	218CI	2101	2113	2265	2350	3456*						
WRTPB	0000	153CI	883	920	1118	1236	1474	1477	1565	1569	2107*		
WRTPDB	0000	100AI	1557	1560*									
WRTPRT	0000	1774I	2308	2353*									
WTMIMO	0000	07FEI	878	881*									
X9C	0000	1B78I	3027*	3030									
XBC	0000	1B86I	3032*	3035									
XCC	0000	1B96I	3037*	3040									
YESEOJ	0000	1C40I	3106	3116*									
ZSEQ	0000	19D0I	99	952	959	1219	1228	1573	1654	2760*			
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ZSQZ	0000	0702I	770*	773									