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COMMON MAGNETIC TAPE

TEST PROGRAM

Consists of:

Test Program Description	B06-172M95R03A15
Test Program Listing	06-172R03A13
Test Tape	06-172M17R03

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COMMON MAGNETIC TAPE TEST PROGRAM DESCRIPTION

1. PURPOSE OF TEST

The Magnetic Tape Test Program tests the function of the Magnetic Tape and its associated interface. Special test and options are provided to enable measurement and isolation of a failure. This program also allows the testing of two devices at once.

Test 0

This test checks all data lines for correct data transfer with worst case data patterns. This test is mandatory.

Test 1

This test checks the ability of the device to write and read variable length records. The write-backspace-read feature is used with records varying in length from X'00'-X'01' to X'00'-X'FF'.

Test 2

This test checks the rewind and skip functions of the device.

Test 3

This test checks all device functions under device interrupt. Proper interrupt reception, interrupt queuing, and interrupt disarm and disable functions are all tested. Read only, write EOF continuous, and other options are provided. (See Appendix F).

Test 4

This test checks device overflow by write-long/read-short and write-short/read-long.

Test 5

This test checks the proper generation of Inter-Record Gaps. (Note that Prolonged repetition of this test may wear out the portion of the tape being used).

Test 6

This test checks the Cylic Redundancy Check Character (CRC). This test applies to 9-Track 800 bpi magnetic tapes only.

Test 7

This is a user utility test which provides compatibility read only check, scope loop and data pattern selection. The user can select the number of bytes per record, number of records per file, and number of files. A WEOF option is provided to write EOF marks to the end of tape.

2. REQUIREMENTS OF MACHINE UNDER TEST

This program assumes that the programs listed below have been run without detecting an error.

For 16-Bit Processor

- Memory Test
- Processor Test

For 32-Bit Processor

- Series 32 Processor Tests
- Series 32 Memory Tests

Other Test Programs

• Common Teletype Basic Confidence Test	06-004
• Common CRT Test	06-146
• Common Line Printer Test	06-170
• Common Current Loop Interface Test	06-184
• Model-1100 CRT Test	06-217
• Common Carousel 300 Test	06-183
• Model-550 Terminal Test	06-243

The magnetic tape must be mounted and the device placed 'ON-LINE'.

75 IPS must be on DMA Bus, 1600 bpi @ 75 IPS should not be run in read block/write-block mode.

Test 6 requires that the interface board be placed on an extender board. This allows hardware adjustments to be made to allow reading of CRC characters (see Section 5.1)

3. MINIMUM HARDWARE REQUIRED

Processor

- Model 7/16 Basic or equivalent
- Model 7/32 or equivalent

Minimum Memory

- 16K Bytes

Console Input Device (See Appendix A)

- Teletype or
- CRT on PASLA/PALM or
- Carousel 15, 35, 300,

List Device (See Appendix A)

- Teletype
- CRT on PASLA/PALM or
- LINE PRINTER or
- CAROUSEL 15, 35, 300

Object Input device or Multimedia loader

Device Under Test

The following tape systems can be tested with this program:

• 9-Track,	800 bpi Magnetic Tape	(M46-470)	45 IPS
• 9-Track,	1600 bpi Magnetic Tape	(M46-475)	45 IPS
• 7-Track,	800 bpi Magnetic Tape	(M46-474)	45 IPS
• 9-Track,	800 bpi Magnetic Tape	(M46-490)	75 IPS
• 9-Track,	800/1600 bpi Magnetic Tape	(M46-494)	75 IPS

Loading Procedure

Manually enter the following X'50' sequence into memory:

	LOCATION	CONTENTS
	X'30'	X'0000'
	X'32'	X'0000'
	X'34'	X'0000'
	X'36'	X'0050'
	X'50'	X'D500'
	X'52'	X'00CF'
	X'54'	X'4300'
	X'56'	X'0080'
800 bpi Magnetic Tape	X'78'	X'85A1'
Floppy Media Disc	X'78'	X'C186'
HSPTR/P	X'78'	X'1399'

4.1 Multi Media Diagonstic Loading

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

4.2 Program Execution

Execute at X'30' and when the processor halts, observe the CHKSUM byte displayed on the console display register D1 (for processors with display panel); (otherwise, check register). If it is zero, loading is complete; otherwise, repeat the loading procedure.

Refer to Appendix A and set up the addresses for the console input device and the bit device.

Address memory location X'A00' for a 32-Bit Processor.
Address memory location X'A04' for a 16-Bit Processor.

Start program execution. The following title is output to the list device:

COMMON MAGNETIC TAPE TEST PROGRAM 06-172R03

5.0 OPERATING PROCEDURES

5.1 Normal Testing

To execute default tests, enter the following via the console device:

TEST (CR)
RUN (CR)

Tests 0, 1, 2, 3, 4, 5 are executed.

If no failure is detected, the list device output will be as shown in Appendix D, and the program returns to console mode after completion of Test 5. In the event of failures, refer to Section 5.3.

To interrupt and terminate a test, the user can either depress the BREAK key on the console device or take the device under test OFF-LINE. When either condition is detected, the test terminates and returns to console input mode. When the device under test is put off-line (DU), the message:

DEVICE OFF-LINE
DEV DDD STA SS

is printed. It is recommended that the tape be terminated properly; therefore, the DU type of test termination should not be used. During scope loop with Write (SCOPE=1, 2 or 3), the DU termination method is not available.

If a failure abnormally terminates the program, the program can be restarted at location X'A04' for 16-Bit Processors or X'A00' for 32-Bit Processors.

5.2# Optional Testing

Normally, the tests write a data file of 256 records and each record contains 256 bytes (execpt for Test 2). The number of records per file can be altered with option RECFIL. In tests 2 and 7, more than one file can be generated by option FILE and option BYTES can be used to vary the number of bytes per record in Tests 3 and 7 (see Appendix C). Inter-record gaps separate records and EOF marks separate files.

To select the mode of data transfer, option MODE must be specified. If MODE 0 is entered, both modes 1 and 2 (see Appendix C) are run in Tests 0, 1, 3, 4, and 7 with SCOPE 0. In all other tests, MODE 2 is used.

To test two devices at the same time, the user can enter the second device address by option DV2ADR. For single device testing, set DV2ADR to zero; otherwise, each selected test is executed twice, once on each device.

Each I/O device is assigned an interrupt level on the Model 8/32 or Series 3200. This level must be entered via option INTLEV. The same level is used for the selector channel and both devices.

Test 6 checks CRC generation. It can be executed only if the magnetic tape system is an 800 bpi 9-track system. The device interface board should be placed on an extender board to enable hardware adjustment. To execute Test 6, set option CRC and options DEVICE and TRACK to the appropriate value. When a file is generated on the tape, the message:

ADD CRC CAPACITOR AND EXECUTE

is printed on the list device and the processor is halted. Add a 0.022 uf capacitor between test points 39 and 40 and a jumper between test points 35 and 38 so the CRC character can be read (Refer to 02-277D08 and 02-277E03). To continue the test, depress the RUN button (or EXE). The capacitor and jumper must be removed upon termination of the test; therefore, this test must be selected alone.

Besides setting option CONTIN (see Appendix C), the selected tests can be continuously looped by turning the console device OFF-LINE. Since Tests 6 and 7 require console I/O, they must not be selected. Test 3 is executed under interrupts, and the user can specify individual operations to be tested through options WRITE, READ, BKSPAC, WEOF, and SKIP (see Appendix C). The test processes only one file, but the user can specify record length and file length through options BYTES and RECFIL (See Appendix C). If read only (See Appendix F) is specified, the user must make sure that the file begins and ends with a file mark. If DU option is set, the message:

TURN DEVICE OFF-LINE MOMENTARILY

is printed. The device under test must be turned OFF-LINE within 60 seconds after the message, but must not remain OFF-LINE for over 30 seconds.

Test 7 provides user utility through options READ, WRITE, BKSPAC, and WEOF. The user can test individual operations (see Appendix F). If the option DATA is set and the selected operation includes the write function, the message:

ENTER DATA:

is printed on the list device. The user can enter a string of up to 64 hexadecimal characters on the console input device.

Use CR to terminate the string and continue execution. If the buffer is full or 64 hexadecimal characters have been accepted, the test automatically continues. If only CR is entered after the message, the test generated buffer (256 bytes of data incremental from X'00' to X'FF') is used. No more data is requested after the first pass if the test is looped.

The user can also specify the number of files to be processed, the file length and record length through options FILES, RECFIL, and BYTES (see Appendix C). For the read only (see Appendix F) operation the user must make sure that there is a leading file mark on the tape and each file is terminated by a file mark. Attempts must not be made to read more files than exist on the tape.

Test 7 also provides scope loop option through option SCOPE (see Appendix C). Scope loops run continuously with no error check until EOT or termination by BREAK or DU.

SCOPE 1, 2, and 3 involve write operations (see Appendix C). In order to properly terminate the tape, the DU method of termination is not available. To terminate the tape before EOT is detected, BREAK must be depressed on the console device. In this case, the test terminates the tape with a file mark. (SCOPE 3 writes and backspaces over the same portion of the tape continuously).

SCOPE 4 performs "read only" continuously until EOT. If EOF is detected, the test pauses with the message:

EOF

If CR is depressed on the console device, the test terminates. If LF is depressed, the test continues reading until EOR or the next EOF. This procedure prevents reading beyond the last EOF on the tape. Reading a blank tape beyond the last EOF mark may cause the entire tape to run off the feeding reel.

SCOPE 5 performs skip EOF operation forward until EOT, and then skips reverse until BOT. It continues back and forth until terminated by BREAK or DU. It is recommended to fill the tape with EOF marks with the WEOF option, before performing this option.

5.3 Error Procedure

Error Recovery

If an error is encountered which is considered recoverable, the program logs an error message and retires 5 times. If it fails after 5 times, the message:

RECOVERY UNSUCCESSFUL

is printed and the test proceeds.

The three types of error messages logged are:

Status Error: The following message is printed:

```
ERROR XXYY
DEV DDD STA SS
```

where: XX = Test number
YY = Error number
DDD = Device number
SS = Device status

Data Error: The following message is printed:

```
ERROR XXYY
DEV DDD
```

Spurious interrupt error:

```
ERROR XXFN
DEV DDD STA SS
PSW PPPP LOC LLLL
```

where: XX = Test number
N = 1 for arithmetic (32-bit) or
fixed point arithmetic (16-bit) fault interrupt
2 for illegal instruction interrupt
3 for machine malfunction interrupt
4 for spurious interrupt from external device
5 for relocation/protection (32-bit) or
floating point divide fault (16-bit) interrupt
6 for device interrupt into wrong interrupt level
7 for data format fault (alignment fault)
DDD & SS = interrupting device address and statue received
in case of 4 above
PPPP = current PSW when interrupt is sensed (least
significant 16 bit for 32-bit M/C)
LLLL = current location when interrupt is sensed
(least significant 16 bits for 32-bit M/C)

6. OTHER MESSAGES

MODE N

This message follows the error message for an error occuring during a data transfer.

N = mode number (see Appendix C)

```
DATA        DATA
WRITTEN     READ
AA          BB
```

This message is logged after data error #46. AA and BB are printed for each pair of unmatching data bytes.

CRC CHAR = AA

This message is printed in Test 6 after the first two CRC characters are read.

CRC CHAR EXPT'D = AA,READ = BB

This message is printed in Test 6 after error #48 is logged. AA and BB are the unmatching CRC characters.

DEVICE OFF-LINE
DEV DDD STA SS

This message is printed whenever DU status is detected on the device under test. (see Section 5.1)

EOT

This message is printed whenever the test is terminated upon detection of EOT.

EOF

This message is printed upon detection of an EOF mark during read only scope loop. (see Section 5.2)

TURN DEVICE OFF-LINE MOMENTARILY
(See Section 5.2)

ADD CRC CAPACITOR AND EXECUTE
(See Section 5.2)

ENTER DATA
(See Section 5.2)

7. Fault Isolation

For error 00, make sure that the device address is correct and the device interface is properly seated.

For NMTN errors (01 and 02), the device may be running away or stuck in an illegal mode. Initialize the device and restart the program.

Make certain that the tape used is good. If errors 10, 11, or 18 occur, change the tape and run test 0 with DUMP = 1.

If a data error occurs, observe the erroneous data bytes printed to establish a pattern of failure. Test 0 detects such data line failures.

If error 16 occurs, repeat Test 4 with DUMP = 1 and observe the data read. Failure can be in the read delay timing circuit.

For interrupt failures in Test 3, repeat Tests 0, 1, and 2. If no error occurs in Tests 0, 1, and 2, the failure is only in the interrupt generation circuit.

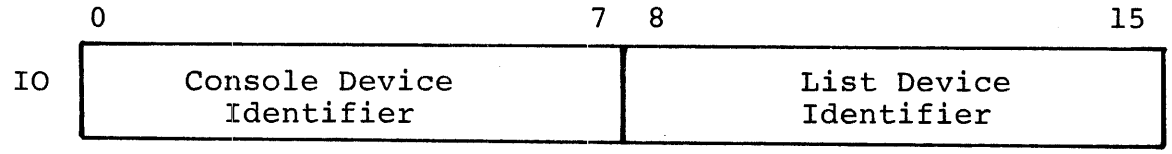
For other status errors, repeat the failing test with long files and records so each operation can be visually distinguished. Follow the program listing to determine exactly where the failure occurs.

The program puts a delimiter at the end of the read buffer before each read operation. Error 47 indicates the delimiter was destroyed by the read.

Scope loops can also be used to further isolate failures.

APPENDIX A
USER DEVICE DEFINITION

The halfword labeled 'IO' (see the Program Listing) has the default value for CRT on a PASLA interface as the input/output console device. If the setup is different 'IO' must be changed as follows:



Console Device Identifier	Meaning
X'01'	GDT/CRT on PASLA/PALM interface, strapped for FDX operation and highest baud rate.
X'02'	TTY/GDT/CRT/Carousel 15/30 on Current Loop Interface
X'03'	Reserved. Interpreted as X'02'
X'04'	Carousel 300 on PASLA/PALM Interface, strapped for FDX operation and highest baud rate.
X'05'	Micro I/O Bus
X'00', X'06' -X'FF'	Reserved. Interpreted as X'02'.

List Device Identifier	Meaning
X'01'	GDT/CRT on PASLA/PALM Interface, strapped for FDX operation and highest baud rate.
X'02'	TTY/GDT/CRT/Carousel 15/30 on Current Loop Interface.
X'03'	Line Printer (Data Printer or Centronics) on Line Printer Interface.
X'04'	Carousel 300 on PASLA/PALM Interface, strapped For FDX operation and highest baud rate.
X'05'	Micro I/O Bus
X'00', X'06' -X'FF'	Reserved. Interpreted as X'02'.

1. The GDT, Terminals 550, 1100, 1200 or CRT, if used on PASLA/PALM interface, should be strapped for device addresses X'10' and X'11', for Receive and Transmit sides, respectively. If the addresses are different, then the halfword labeled 'PASLADR' (see the Program Listing) must be changed accordingly.

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

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

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

5. The Micro I/O Bus, if used, should be strapped for device address X'C0'. If the address is different, the halfword labeled MICROBUS (see the Program Listing) must be changed accordingly.

APPENDIX B
COMMAND/OPTION INPUT METHOD

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

APPENDIX C
OPTIONS TABLE

OPTION	DEFAULT	TESTS	DESCRIPTION
BKSPAC	1	3,7	Selects backspace operation (see Note 3) 0 = no backspace 1 = perform backspace
BYTES	X'FF'	3,7	Number of bytes per record Minimum = 2 Maximum = X'400' (See Note 1)
COMPAR	1	3,7	Specifies data comparison 0 = no compare 1 - compare data
CONTIN	0	All	Enables the selected tests to be executed continuously until interrupted. 0 = normal execution 1 = continuous execution
CRC	0	6	Selects CRC check 0 = no CRC check 1 = perform CRC check
DATA	1	7	Specifies if external data pattern is to be requested. 0 = use program generated data pattern 1 = request for external data pattern
DEVADR	X'0085'	All	Specifies the physical device address of the device under test (must not be zero)
DEVICE	0	6	Selects 800 or 1600 bpi magnetic tape. 0 = 800 bpi drive 1 = 1600 bpi drive

OPTION	DEFAULT	TESTS	DESCRIPTION
DU	0	3	Tests DU interrupt 0 = no DU interrupt 1 = test DU interrupt
DUMP	0	0,1,3,4,7	Specifies read buffer dump 0 = no dump 1 - dump data buffer
DV2ADR	X'0000'	All	Specifies the physical and device address for the 2nd device to be tested. (Must be zero if only one device is under test).
FILES	1	1,7	Number of files to Write of Read Maximum = X'400' (See Note 1)
INTLEV	0	3	Specifies interrupt level of device (2) under test. The same level is assigned to both devices and SELCH.
IRG	X'10'	5	Number of times of read and back-space to be performed in gap-data check Maximum = X'FF' (See Note 1)
LOOP	0	All	Number of times the selected tests are to be repeated. Maximum = X'FFFF'.
MODE	2	All	Selects mode of operation 0 = selects both modes 1 = Read Block-Write Block 2 = SELCH mode Note: Mode 1 can not be used on the following tape drives: 1600 bpi, 45 IPS; 1600 bpi, 75 IPS; 800 bpi, 75 IPS.
NOMSG	0	All	Suppresses all messages except error messages. 0 = all messages 1 = only error messages

OPTION	DEFAULT	TESTS	DESCRIPTION
OPTION		All	Lists all option values selected. (See Note 2)
RDCRC	0	6	Specifies read CRC only 0 = Write and Read CRC 1 = Read CRC only
READ	1	3,7	Selects read operation 0 = no read 1 = perform read
RECFIL	X'100'	All	Number of records per file. Maximum = X'400' (See Note 1)
REPEAT	X'0003'	2	Number of skips to be performed. Maximum = X'FF' (See Note 1)
RSTART	0	All	Relocates the starting address of Read Buffer (See Note 4)
RUN		All	Starts Test.
SCOPE	0	7	Specifies scope loop 0 = no scope loop 1 = Write-Backspace-Read 2 = Write only 3 = Write-Backspace (avoid) 4 = Read only 5 = Skip
SELCH	X'00F0'	All	Specifies device address of selector channel.
SKIP	1	3	Selects skip operation (See Note 3) 0 = no skip 1 - perform skip
TEST	0,1,2,3,4,5	All	Selects test or tests to be executed (see Appendix B)

OPTION	DEFAULT	TESTS	DESCRIPTION
CON		All	Gives control to CPU console. Legal only for series 16 & Series 32 processors.
TIMVAL	X'140'	All	Defines a 1 ms time for different models. Subroutine Init multiplies TIMVAL by 10 to obtain a basic delay time unit of 10 ms. X'D2' for 7/16 Basic, Model 74, or equivalent X'14D' for 7/16 HSALU (750 ns memory) X'134' for 7/16 HSALU (1000 ns memory) X'14A' for 6/16 MOS X'14D' for 8/16 (750 ns Memory) and equivalent X'134' for 6/16 (1000 ns Memory) and equivalent X'EB' for 7/32 (750 ns Memory) X'D2' for 7/32 (1000 ns Memory) X'DA' for 8/32 X'133' for Models 80, 85, and 60 X'C8' for Models 70, 50, and 55 X'260' for 3220 with CACHE X'1A4' for 3240 with CACHE X'14D' for Series 16 processors
TRACK	9	All	Defines number of tracks for the device. 7 = seven track drive 9 = nine track drive
WEOF	0	3,7	Write EOF mark continuously until EOT (See Note 3) 0 = Write/Read records 1 = Write EOF only
WRITE	1	3,7	Selects write operation (See Note 3) 0 = no write 1 = perform write

OPTION	DEFAULT	TESTS	DESCRIPTION
WSTART	0	All	Relocates the starting address of Write Buffer (See Note 4)

NOTES

1. Minimum is 1. If 0 is entered, it is defaulted to 1.

2. A page of 20 options is listed at a time on the list device. At the end of each full page, the LF key must be depressed to continue listing the next page. If CR is depressed, the listing is terminated. The BREAK key is used to stop listing on any device.

3. Also see Appendix F.

4. If not entered, the Read buffer and Write buffer are defaulted to values within test program memory.

   If RSTART or WSTART is entered, the relocated buffer is guarded against being located in the test program. If the user attempts to relocate the Read or Write buffers in the test program , one of the following error messages is printed:

   ERROR: READ BUFFER IN TEST MEMORY
   or

   ERROR: WRITE BUFFER IN TEST MEMORY

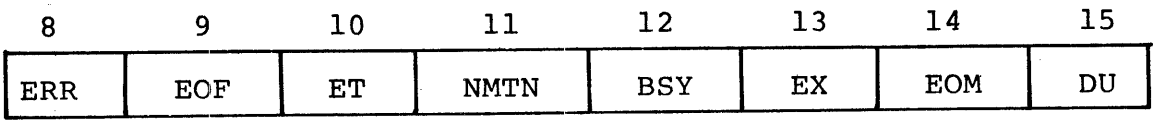
If the Read or Write buffers are relocated so that they overlap, an error message is printed as follows:

ERROR: READ BUFFER IN WRITE BUFFER

APPENDIX D
Expected Result Table

	Approx. Time to run on a 7/16 BASIC with Default Options using a 45 IPS/800BPI MAG TAPE UNIT.
*TEST	
*RUN	
TEST 00	
NO ERROR	4.5 min.
TEST 01	
NO ERROR	0.75 min.
TEST 02	
NO ERROR	1.25 min.
TEST 03	
NO ERROR	1.75 min.
TEST 04	
NO ERROR	1.75 min
TEST 05	
NO ERROR	0.25 min
END OF TEST	

APPENDIX E



STATUS BYTE OF MAGNETIC TAPE CONTROLLER

ERROR TABLE

ERROR NUMBER	TEST APPLICABLE	DESCRIPTION
00	All	SELCH (ESELCH) or Magnetic Tape Drive device address does not return SYNC.
01	All	NMTN bit does not set within given time limit.
02	All	NMTN bit does not set after a REWIND operation.
04	All	EOM bit does not set within given time limit.
05	All	EOF bit does not set or EX and ERR bits set after a WRITE-END-OF-FILE-MARK operation.
06	0,2,6	EOF bit does not set or EX and ERR bits set after a READ operation.
07	0,2,3,5	EOF bit does not set or EX and ERR bits set after a skip and backspace operation.
08	0,1,2,3,4,5,7	EX bit sets after a BACKSPACE-RECORD operation.
09	2,3	ET bit does not set after completing REWIND operation.
10	All	EX bit sets after a WRITE-RECORD operation.
11	All	EX bit sets after a READ-RECORD operation.
12	0,1,2,4,5,6,7	DU, EX, BSY, EOM bit(s) set after a READ-BLOCK COMMAND (WB OR WBR).
13	0,1,2,4,5,6,7	DU, EX, BSY, EOM bit(s) set after a READ-BLOCK COMMAND (RB or RBR).

ERROR NUMBER	TEST APPLICABLE	DESCRIPTION
14	0,1,2,4,5,6,7	Terminating address of data transfer through SELCH (ESELCH) is not equal to the expected value (WRITE Mode).
15	0,1,2,4,5,6,7	Terminating address of data transfer through SELCH (ESELCH) is not equal to the expected value (READ Mode).
16	4	No error is detected when reading a written record with inaccurate record size.
17	4	ERR bit does not set after read of only part of a written record.
18	4	ERR bit does not set after reading a written record of over-size record length.
19	5	Tape does not stop at expected position after a BACKSPACE-RECORD operation.
20	3	No interrupt generated after a REWIND operation.
21	3	No interrupt generated after a WRITE-END-OF-FILE-MARK operation.
22	3	No interrupt generated when EOM and NMTN bits set.
23	3	No interrupt generated when NMTN bit sets after a WRITE-END-OF-FILE-MARK operation.
24	3	No interrupt generated after a BACK-SPACE-FILE operation.
25	3	No interrupt generated after a BACK-SPACE-RECORD operation.
26	3	No interrupt generated after a WRITE-BLOCK operation (WB or WBR).
27	3	No interrupt generated after a READ-BLOCK operation (RB or RBR).
28	3	No interrupt generated after data transfer through SELCH (ESELCH) terminates, in write mode.

ERROR NUMBER	TEST APPLICABLE	DESCRIPTION
29	3	No interupt generated after data transfer through SELCH (ESELCH) terminates, in read mode.
30	3	No interrupt generated after SKIP-FILE-FORWARD operation.
31	3	No interrupt generated after SKIP-FILE-REVERSE operation.
32	3	No interrupt generated when tape drive is turned OFF-LINE.
33	3	DU bit does not set after tape drive is turned OFF-LINE.
34	3	No interrupt generated when tape drive is turned ON-LINE.
35	3	DU bit does not reset after tape drive is turned ON-LINE.
37	3	Interrupt cannot be queued while NMTN bit changes from 0 to 1 with magnetic tape drive interrupt enable and PSW changes from '7OF0' to 30F0'.
38	3	Interrupt generated after issuing DISARM command to magnetic tape drive.
39	3	Interrupt generated after issuing DISABLE command to magnetic tape drive.
46	0,1,2,3,4,5,7	Read buffer does not match with write buffer.
47	0,1,2,3,4,5,7	Delimiter between read and write buffer is not equal to expected value.
48	6	CRC parity check error.
50	All	Write protect sets.
51	6	CRC checkword of zero expected.

APPENDIX F
Optional Testing Table

TEST 3

FUNCTIONS / OPTIONS	WRITE EOF CONTINUOUS	WRITE ONLY	READ ONLY	WRITE BACKSPACE	WRITE BACKSPACE READ	WRITE REWIND READ	WRITE SKIP	READ SKIP	WRITE BACKSPACE SKIP	WRITE BACKSPACE READ SKIP	WRITE REWIND READ SKIP
WRITE	X	X	0	X	1	1	X	0	X	1	1
READ	X	0	1	0	1	1	0	1	0	1	1
WEOF	1	0	X	0	0	0	0	X	0	0	0
BKSPAC	X	0	X	1	1	0	0	X	1	1	0
SKIP	X	0	0	0	0	0	1	1	1	1	1

TEST 7

FUNCTIONS / OPTIONS	WRITE EOF * CONTINUOUS	WRITE ONLY	READ ONLY	WRITE BACKSPACE	WRITE BACKSPACE READ	WRITE SKIP REVERSE READ
WRITE	X	X	0	X	1	1
READ	X	0	1	0	1	1
WEOF	1	0	X	0	0	0
BKSPAC	X	0	X	1	1	0

* No error check for write EOF continuous in Test 7 (Scope check)

To obtain the desired function, each option specified on the left must be set to the value shown in the function column (note that an 'X' indicates that the option may be either '0' or '1').

APPENDIX G
Related Documents

Test Program Listing	06-172M96R02
Test Program Paper Tape	06-172M17R02
Magnetic Tape System Instruction Manuals	
9-Track, 800 bpi M46-470	29-503
9-Track, 1600 bpi M46-475	29-503
7-Track, 800 bpi M46-474	29-295
9-Track, 800 bpi M46-490	29-503
9-Track, 800/1600 bpi M46-494	29-503

PROG= CMT172 ASSEMBLED BY CAL 03-066R07-00 (32-BIT)

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 1  CMT172   PROG  COMMON MAGNETIC TAPE TEST PROGRAM  06-172R03A13          CMT00010
 2           WIDTH 120                                                      CMT00030
 3           CROSS                                                          CMT00040
 4           NLSTC                                                          CMT00050
 5           ERLST                                                          CMT00060
 6  *                                                                       CMT00070
 7  *                                                                       CMT00080
 8  * ********************************************************************  CMT00090
 9  *        COPYRIGHT   BY PERKIN ELMER   CORPORATION      MAY  1979 *     CMT00100
10  *                                                                   *   CMT00110
11  *        COMMON MAGNETIC TEST PROGRAM 06-172R03                     *   CMT00120
12  *                                                                   *   CMT00130
13  *        PROGRAM USES THE COMMON INSTRUCTION SET                    *   CMT00140
14  *                                                                   *   CMT00150
15  *        THIS PROGRAM TESTS THE MAGNETIC TAPE SYSTEM, AND THE       *   CMT00160
16  *        ASSOCIATED INTERFACES                                      *   CMT00170
17  *        THE PROGRAM CONSISTS OF 8 TESTS, WITH TEST 7 BEING         *   CMT00180
18  *        THE UTILITY TEST PROVIDING SCOPE LOOP.                     *   CMT00190
19  *        THERE ARE 29 OPTIONS AVAILABLE TO THE USER AND 51          *   CMT00200
20  *        ERROR MESSAGES TO ENABLE ISOLATION OF A MALFUNCTION        *   CMT00210
21  *        TO THE HARDWARE LEVEL. ERROR RECOVERY IS PROVIDED          *   CMT00220
22  *        FOR CERTAIN DATA TRANSFER ERRORS.                          *   CMT00230
23  *                                                                   *   CMT00240
24  *        THE PROGRAM REQUIRES EITHER 7/16 BASIC OR EQUIVALENT       *   CMT00250
25  *        PROCESSOR, OR 7/32 OR EQUIVALENT PROCESSOR WITH 16K        *   CMT00260
26  *        BYTES OF MEMORY. OPTIONS AND RUN COMMAND ARE TO BE         *   CMT00270
27  *        ENTERED VIA A CONSOLE DEVICE. EITHER ONE OR TWO            *   CMT00280
28  *        DEVICES CAN BE TESTED AT THE SAME TIME.                    *   CMT00290
29  *                                                                   *   CMT00300
30  *        THE 06-172M17 TAPE IS AN ABSOLUTE TAPE WITH A FRONT-       *   CMT00310
31  *        END BOOT LOADER                                            *   CMT00320
32  *                                                                   *   CMT00330
33  *        TEST 0                                                     *   CMT00340
34  *        TESTS ALL DATA LINES FOR CORRECT DATA TRANSFER WITH        *   CMT00350
35  *        WORST CASE DATA PATTERNS. THIS TEST IS MANDATORY,          *   CMT00360
36  *        AND IS EXECUTED AT LEAST ONCE.                             *   CMT00370
37  *                                                                   *   CMT00380
38  *        TEST 1                                                     *   CMT00390
39  *        TESTS THE ABILITY OF THE DEVICE TO WRITE AND READ          *   CMT00400
40  *        VARIABLE LENGTH RECORDS.                                   *   CMT00410
41  *                                                                   *   CMT00420
42  *        TEST 2                                                     *   CMT00430
43  *        TESTS THE REWIND AND SKIP FUNCTION OF THE DEVICE           *   CMT00440
44  *                                                                   *   CMT00450
45  *        TEST 3                                                     *   CMT00460
46  *        TESTS ALL DEVICE FUNCTIONS UNDER DEVICE INTERRUPT.         *   CMT00470
47  *        PROPER INTERRUPT RECEPTION, INTERRUPT QUEUING AND          *   CMT00480
48  *        INTERRUPT DISARM & DISABLE FUNCTIONS ARE ALL CHECKED.      *   CMT00490
49  *                                                                   *   CMT00500
50  *        TEST 4                                                     *   CMT00510
51  *        THIS TEST IS DESIGNED TO TEST DEVICE OVERFLOW BY           *   CMT00520
52  *        WRITE-LONG READ-SHORT AND WRITE SHORT READ LONG            *   CMT00530
53  *                                                                   *   CMT00540
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                                54  *       TEST 5                                                  *       CMT00550
                                55  *       THIS TEST CHECKS THE PROPER GENERATION OF INTER-RECORD   *       CMT00560
                                56  *       GAPS. (NOTE: PROLONGED REPETITION OF THIS TEST MAY      *       CMT00570
                                57  *       WEAR THE FRONT PORTION OF THE TAPE.)                    *       CMT00580
                                58  *                                                               *       CMT00590
                                59  *       TEST 6                                                  *       CMT00600
                                60  *       THIS TEST CHECKS THE CYCLIC REDUNDUNCY CHECK (CRC)      *       CMT00610
                                61  *       CHARACTER.                                              *       CMT00620
                                62  *                                                               *       CMT00630
                                63  *       TEST 7                                                  *       CMT00640
                                64  *       THIS IS A USER UTILITY TEST, PROVIDING COMPATIBILITY    *       CMT00650
                                65  *       READ ONLY CHECK, SCOPE LOOP AND DATA PATTERN            *       CMT00660
                                66  *       SELECTION. THE USER CAN SELECT NUMBER OF BYTES PER      *       CMT00670
                                67  *       RECORD, NUMBER OF RECORDS PER FILE AND NUMBER OF        *       CMT00680
                                68  *       FILES A WEOF OPTION IS PROVIDED TO WRITE EOF MARKS      *       CMT00690
                                69  *       TO THE END OF TAPE.                                     *       CMT00700
                                70  *                                                               *       CMT00710
                                71  *       ANY COMBINATION OF THIS TESTS CAN BE SELECTED AS A      *       CMT00720
                                72  *       STRING AND CAN BE LOOPED OR RUN CONTINUOUSLY.           *       CMT00730
                                73  * ***************************************************************       CMT00740
                                74  *                                                               *       CMT00750
                                75  *                                                                       CMT00760
    0000 0000                   76  R0      EQU   0                                                         CMT00770
    0000 0001                   77  R1      EQU   1                                                         CMT00780
    0000 0002                   78  R2      EQU   2                                                         CMT00790
    0000 0003                   79  R3      EQU   3                                                         CMT00800
    0000 0004                   80  R4      EQU   4                                                         CMT00810
    0000 0005                   81  R5      EQU   5                                                         CMT00820
    0000 0006                   82  R6      EQU   6                                                         CMT00830
    0000 0007                   83  R7      EQU   7                                                         CMT00840
    0000 0008                   84  R8      EQU   8                                                         CMT00850
    0000 0009                   85  R9      EQU   9                                                         CMT00860
    0000 000A                   86  R10     EQU   10                                                        CMT00870
    0000 000B                   87  R11     EQU   11                                                        CMT00880
    0000 000C                   88  R12     EQU   12                                                        CMT00890
    0000 000D                   89  R13     EQU   13                                                        CMT00900
    0000 000E                   90  R14     EQU   14                                                        CMT00910
    0000 000E                   91  RET     EQU   14                                                        CMT00920
    0000 000F                   92  R15     EQU   15                                                        CMT00930
    0000 000F                   93  LINK    EQU   15                                                        CMT00940
    0000 0004                   94  CHAR    EQU   4                 .                       **      CMT00950
    0000 0005                   95  STAT    EQU   5                 .                       **      CMT00960
    0000 0006                   96  DEV     EQU   6                 .                       **      CMT00970
    0000 0007                   97  SELCH   EQU   7                 .                       **      CMT00980
                                98  *                                                               CMT00990
                                99  *  BOOTLOADER WITH CHKSUM                                       CMT01000
                               100  *                                                               CMT01010
0000R                          101          CRG   X'80'                                              CMT01020
0080  2421                     102          LIS   R2,1                                               CMT01030
0082  2303                     103          BS    BOOT                                               CMT01040
0084  3F00                     104          DC    Z(PSWSAVE)        CURRENT PSW SAVE POINTER(32-BIT M/C)  CMT01050
0086  3F08                     105          DC    Z(RSAVE)          REGISTER SAVE POINTER(32-BIT M/C)     CMT01060
0088  C810 0A00                106  BOOT    LHI   R1,ORIGIN1       R1 = ADR( FIRST BYTE OF TEST PROG )   CMT01070
008C  C830 363A                107          LHI   R3,LNZB+1         R3 = ADR( LAST NON-ZERO BYTE + 1 )    CMT01080
0090  4030 0022                108          STH   R3,X'22'          REGISTER SAVE POINTER (16-BIT M/C)    CMT01090
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0094  2731            109          SIS   R3,1          R3 = ADR( LAST NON-ZERO BYTE )          CMT01100
0096  C860 0037       110  MN      LHI   R6,X'37'      R6 = CHKSUM BYTE = X'MN'                CMT01110
009A  D340 0078       111          LB    R4,X'78'      INPUT DEV ADR                           CMT01120
009E  DE40 0079       112          OC    R4,X'79'                                              CMT01130
00A2  9D45            113  LEADER  SSR   R4,R5                                                 CMT01140
00A4  2091            114          BTBS  9,1           DU,BSY                                  CMT01150
00A6  9B45            115          RDR   R4,R5                                                 CMT01160
00A8  0855            116          LDAR  R5,R5                                                 CMT01170
00AA  2234            117          BZS   LEADER        IGNORE LEADER                           CMT01180
00AC  D251 0000       118  LOAD    STB   R5,0(R1)      STORE 1ST NON-ZERO & SUBSEQUENT BYTE    CMT01190
00B0  D351 0000       119          LB    R5,0(R1)      RELOAD DATA BYTE TO                     CMT01200
00B4  0765            120          XAR   R6,R5         GENERATE CHKSUM                         CMT01210
00B6  9481            121          EXBR  R8,R1                                                 CMT01220
00B8  9828            122          WHR   R2,R8         DISPLAY MEMORY ADDRESS                  CMT01230
00BA  9D45            123          SSR   R4,R5                                                 CMT01240
00BC  2091            124          BTBS  9,1           DU,BSY                                  CMT01250
00BE  9B45            125          RDR   R4,R5                                                 CMT01260
00C0  C110 00AC       126          BXLE  R1,LOAD       LOAD TILL LAST BYTE                     CMT01270
00C4  9486            127          EXBR  R8,R6                                                 CMT01280
00C6  9828            128          WHR   R2,R8         FINAL CHKSUM                            CMT01290
00C8  2478            129  LDWT    LIS   R7,8                                                  CMT01300
00CA  917C            130          SLLS  R7,12         R7 = X'8000'                            CMT01310
00CC  9557            131          EPSR  R5,R7         HALT PROCESSOR.                         CMT01320
00CE  2203            132          BS    LDWT                                                  CMT01330
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00D0                          134            ORG   X'A00'                                                    CMT01350
0A00   4300 0A30              135  ORIGIN1   B     START1          START HERE FOR 32-BIT PROCESSOR           CMT01360
       0CC0 0A04              136  ORIGIN2   EQU   *                                                         CMT01370
0A04                          137            IFZ   ADC-2                                                     CMT01380
0A04   4300 0A46              138            B     START2          START HERE FOR 16-BIT PROCESSOR           CMT01390
0A08   4300 0A5E              139  ORIGIN3   B     START3          SPECIAL 32-BIT PROCESSOR START            CMT01400
0A0C   4300 0A62              140  ORIGIN4   B     START4                                                    CMT01410
                              141            ELSE                                                            CMT01420
                              145            ENDC                                                            CMT01460
                              146  *                                                                         CMT01470
                              147  *-----------------------------                                            CMT01480
                              148  *   TEST CONSTANTS                                  *                     CMT01490
                              149  *                                                                         CMT01500
0A10   0101                   150  IO        DC    X'0101'         I/O DEVICE(S) IDENTIFIER                  CMT01510
0A12   1011                   151  PASLADR   DC    X'1011'         PASLA/PALM READ/WRITE ADDRESSES           CMT01520
0A14   0202                   152  CLIFADR   DC    X'0202'         CURRENT LOOP INTERFACE R/W ADDRESSES      CMT01530
0A16   6262                   153  LPADR     DC    X'6262'         LINE PRINTER ADDRESS                      CMT01540
0A18   1011                   154  C300ADR   DC    X'1011'         CAROUSEL 300/PASLA ADDRESSES              CMT01550
0A1A   CCC0                   155  MICROBUS  DC    X'CCC0'         MICROBUS ADDRESS                          CMT01560
0A1C   0000                   156            DCX   0               PROVISION FOR SPECIAL DEVICE              CMT01570
                              157  *                                                                         CMT01580
                              158  * IO =    0101  FOR CRT ON PASLA                                          CMT01590
                              159  *         0202  FOR TELETYPE, CAROUSEL 15/30                             CMT01600
                              160  *         XX03  FOR LINE PRINTER                                        CMT01610
                              161  *         0404  FOR CAROUSEL 300                                        CMT01620
                              162  *         0505  FOR MICROBUS                                            CMT01630
                              163  *                                                                         CMT01640
0A1E   0140                   164  TIME      DC    X'140'          CONSTANT FOR 1 MS DELAY(X'C8'-MOD70)      CMT01650
0A20   0000                   165            DCX   0               RESERVED                                  CMT01660
0A22   70F0                   166  PSW       DCX   70F0            PSW USED IN PROGRAM                       CMT01670
0A24   30F0                   167  PSW2      DCX   30F0            PSW USED IN EXEC                          CMT01680
0A26   0000                   168            DCX   0               RESERVED                                  CMT01690
0A28   0000                   169            DCX   0               RESERVED                                  CMT01700
0A2A   0000                   170            DCX   0               RESERVED                                  CMT01710
0A2C   0000                   171            DCX   0               RESERVED                                  CMT01720
0A2E   0000                   172            DCX   0               RESERVED                                  CMT01730
                              173  *-----------------------------                                            CMT01740
                              174  *                                                                         CMT01750
0A30   0711                   175  START1    XAR   R1,R1                                                    CMT01760
0A32   4010 0030              176            STH   R1,X'30'        DISABLE INT AT PROCESSOR LEVEL            CMT01770
0A36   4820 0A24              177            LH    R2,PSW2                                                   CMT01780
0A3A   4020 0032              178            STH   R2,X'32'        SELECT REG SET 15                         CMT01790
0A3E                          179            IFZ   ADC-2                                                     CMT01800
0A3E   2521                   180            LCS   R2,1                                                      CMT01810
0A40   4020 16C4              181            STH   R2,MOD32        SET MODEL 32 PROCESSOR FLAG               CMT01820
0A44   23C6                   182            BS    ST                                                        CMT01830
0A46   0711                   183  START2    XAR   R1,R1                                                    CMT01840
0A48   4010 16C4              184            STH   R1,MOD32        RESET MOD 32 PROCESSOR FLAG               CMT01850
0A4C   4810 0A24              185            LH    R1,PSW2                                                   CMT01860
                              186            ENDC                                                            CMT01870
0A50   C820 0A66              187  ST        LHI   R2,START                                                  CMT01880
0A54   4010 0034              188            STH   R1,X'34'                                                  CMT01890
0A58   4020 0036              189            STH   R2,X'36'        II INT NEW PSW LOC                        CMT01900
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0A5C  0000           190          DCX   0                 TAKE AN ILLEGAL INSTRUCTION INT     CMT01910
                     191  *                                                                     CMT01920
0A5E  4300 0A30      192  START3  B     START1            INSERT SPECIAL ROUTINE HERE         CMT01930
0A62                 193          IFZ   ADC-2                                                   CMT01940
0A62  4300 0A46      194  START4  B     START2            INSERT SPECIAL ROUTINE HERE         CMT01950
                     195          ENDC                                                          CMT01960
                     196  *                                                                     CMT01970
0A66  D310 0A10      197  START   LB    R1,IO             GET I/O IDENTIFIERS                 CMT01980
0A6A  D320 0A11      198          LB    R2,IO+1                                               CMT01990
0A6E  2436           199          LIS   R3,6              IDENTIFIER CAN BE 1,2,3,4,5         CMT02000
0A70  0513           200          CLHR  R1,R3                                                   CMT02010
0A72  2182           201          BLS   IO.OK1            BRANCH IF KB IDENTIFIER OK          CMT02020
0A74  2411           202          LIS   R1,1              OTHERWISE FORCE IT TO BE PASLA       CMT02030
0A76  0523           203  IO.OK1  CLHR  R2,R3                                                   CMT02040
0A78  2182           204          BLS   IO.OK2            SAME TEST FOR LIST DEVICE           CMT02050
0A7A  2421           205          LIS   R2,1                                                   CMT02060
0A7C  D210 0A10      206  IO.OK2  STB   R1,IO             REESTABLISH VALUES                  CMT02070
0A80  D220 0A11      207          STB   R2,IO+1                                                 CMT02080
0A84  D362 16F4      208          LB    R6,CONRQ2S(R2)                                        CMT02090
0A88  4060 16D8      209          STH   R6,PASFLG2        SET PASLA FLAG (LIST DEVICE)        CMT02100
0A8C  0866           210          LDAR  R6,R6                                                   CMT02110
0A8E  2336           211          BZS   IO.OK3            SKIP IF NOT PASLA                   CMT02120
0A90  9121           212          SLHLS R2,1                                                    CMT02130
0A92  D302 0A11      213          LB    R0,IO+1(R2)                                           CMT02140
0A96  DE02 16E8      214          OC    R0,CON2ND(R2)     ISSUE 2ND COMMAND (LIST DEVICE)     CMT02150
                     215  *                                                                     CMT02160
0A9A  41F0 1304      216  IO.OK3  BAL   LINK,SETKB        ESTABLISH KEYBOARD DEVICE           CMT02170
0A9E  9310           217          LBR   R1,R0             (R1) = 1,2,4,5                      CMT02180
0AA0  9111           218          SLHLS R1,1              (R1) = 2,4,6,A                      CMT02190
0AA2  4831 0A10      219          LH    R3,IO(R1)                                             CMT02200
0AA6  4030 16DA      220          STH   R3,CONADR         SET UP CONSOLE DEVICE ADDRESS       CMT02210
0AAA  4821 16DC      221          LH    R2,CONRD(R1)                                          CMT02220
0AAE  4020 16DC      222          STH   R2,CONRD          SET UP R/W COMMANDS                 CMT02230
0AB2  4821 16E8      223          LH    R2,CON2ND(R1)                                         CMT02240
0AB6  4020 16E8      224          STH   R2,CON2ND         2ND CMD; ENABLE READ CMD            CMT02250
0ABA  9011           225          SRHLS R1,1                                                    CMT02260
0ABC  D341 16F4      226          LB    R4,CONRQ2S(R1)                                        CMT02270
0AC0  D240 16F4      227          STB   R4,CONRQ2S        CONSOLE REQUEST TO SEND             CMT02280
0AC4  4040 16D6      228          STH   R4,PASFLG         SET PASLA FLAG (CONSOLE)            CMT02290
0AC8  0844           229          LDAR  R4,R4                                                   CMT02300
0ACA  2333           230          BFFS  3,3               SKIP IF NOT PASLA                   CMT02310
0ACC  9422           231          EXBR  R2,R2                                                   CMT02320
0ACE  9E32           232          OCR   R3,R2             ISSUE 2ND COMMAND (CONSOLE)         CMT02330
                     233  *                                                                     CMT02340
0AD0  41F0 1360      234          BAL   LINK,LCORE        SET UP LOW CORE                     CMT02350
0AD4  2400           235          LIS   R0,0                                                    CMT02360
0AD6  40C0 1704      236          STH   R0,WASDU          RESET 'DEVICE UNAVAILABLE' FLAG     CMT02370
0ADA  41F0 11A2      237          BAL   LINK,CRLF                                               CMT02380
0ADE  C850 1978      238          LHI   R5,TITLE                                                CMT02390
0AE2  41F0 112A      239          BAL   R15,PRINT         PRINT TEST PROGRAM TITLE            CMT02400
                     240  *--------------------------                                          CMT02410
                     241  *  KEYBOARD INPUT ROUTINE                                           CMT02420
                     242  *                                                                     CMT02430
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                0000 0AE6          243  OPTIN    EQU   *                                                    CMT02440
0AE6            41F0 11A2          244           BAL   LINK,CRLF          CR,LF TO LIST DEVICE              CMT02450
                0000 0AEA          245  OPTIN1   EQU   *                                                    CMT02460
0AEA            4820 0A24          246           LH    R2,PSW2                                              CMT02470
0AEE            9512               247           EPSR  R1,R2              NO INT. REG SET 15                CMT02480
0AF0            41F0 1304          248           BAL   LINK,SETKB         ESTABLISH CONSOLE                 CMT02490
0AF4            D340 17B4          249           LB    R4,AMSG            OUTPUT AN * TO INDICATE           CMT02500
0AF8            41F0 11B0          250           BAL   LINK,OUTCHR        COMMAND MODE ESTABLISHED          CMT02510
0AFC            2541               251           LCS   R4,1               X'FF'                             CMT02520
0AFE            41F0 11B0          252           BAL   LINK,OUTCHR                                          CMT02530
0B02            C8C0 1250          253           LHI   R12,QUESTN         SET UP R12 FOR ERR ROUTINE        CMT02540
0B06            C800 2020          254           LHI   R0,X'2020'         BLANK OUT COMMAND BUFFER          CMT02550
0B0A            4000 3E40          255           STH   R0,OPTBUF          WHICH WILL CONTAIN OPTION         CMT02560
0B0E            4000 3E42          256           STH   R0,OPTBUF+2        NAME                              CMT02570
0B12            4000 3E44          257           STH   R0,OPTBUF+4                                          CMT02580
0B16            0711               258           XAR   R1,R1              CLEAR OPTBUF INDEX                CMT02590
0B18            41F0 121C          259  RDCHR    BAL   R15,GETCHR         GET A CHAR IN R4                  CMT02600
0B1C            C540 0060          260           CLHI  R4,X'60'           UPPER CASE ALPHA ?                CMT02610
0B20            2183               261           BLS   RDCHAR0            BRANCH IF NO.                     CMT02620
0B22            CB40 0020          262           SHI   R4,X'20'           CONVERT TO LOWER CASE             CMT02630
0B26            C540 0023          263  RDCHAR0  CLHI  R4,X'23'           IS IT # ?                         CMT02640
0B2A            4330 0AE6          264           BE    OPTIN                                                CMT02650
0B2E            C540 005F          265           CLHI  R4,X'5F'           LEFT ARROW, UNDERLINE OR DELETE ? CMT02660
0B32            2139               266           BNES  RDCHR1                                               CMT02670
0B34            2711               267           SIS   R1,1               YES, DECREMENT INDEX              CMT02680
0B36            021C               268           BMR   R12                BUFFER UNDERFLOW; PRINT '?'       CMT02690
0B38            C8C0 0020          269           LHI   R0,X'20'                                             CMT02700
0B3C            D201 3E40          270           STB   R0,OPTBUF(R1)                                        CMT02710
0B40            4300 0B18          271           B     RDCHR                                                CMT02720
0B44            C540 000D          272  RDCHR1   CLHI  R4,X'0D'           IS IT CR ?                        CMT02730
0B48            233C               273           BES   LOOKUP             YES, TRY MATCH                    CMT02740
0B4A            C540 0020          274           CLHI  R4,X'20'           IS IT A BLANK?                    CMT02750
0B4E            2339               275           BES   LOOKUP             YES, TRY MATCH                    CMT02760
0B50            C510 0006          276           CLHI  R1,6               7 CHARACTERS INPUT ?              CMT02770
0B54            038C               277           BNLR  R12                IF YES, ERROR                     CMT02780
0B56            D241 3E40          278           STB   R4,OPTBUF(R1)      STORE CURRENT BYTE                CMT02790
0B5A            2611               279           AIS   R1,1               BUMP BUFFER INDEX                 CMT02800
0B5C            4300 0B18          280           B     RDCHR              READ NEXT CHARACTER               CMT02810
                                   281  *-----------------------------------                               CMT02820
                                   282  *  OPTION MATCH ROUTINE                                            CMT02830
                                   283  *                                                                  CMT02840
0B60            C810 17B6          284  LOOKUP   LHI   R1,OPT             LOAD ADDRESS OF OPTION TABLE      CMT02850
0B64            0733               285  LOOK1    XAR   R3,R3              CLEAR BUFFER INDEX                CMT02860
0B66            0861               286           LDAR  R6,R1              SET OPTION WORD INDEX             CMT02870
0B68            4856 0000          287  LOOK2    LH    R5,0(R6)                                             CMT02880
0B6C            021C               288           BMR   R12                IF MINUS, THEN NO MATCH = ERROR   CMT02890
0B6E            4553 3E40          289           CLH   R5,OPTBUF(R3)      COMPARE TO OPTBUF HW              CMT02900
0B72            2333               290           BES   LOOK3                                                CMT02910
0B74            261C               291           AIS   R1,12                                                CMT02920
0B76            2209               292           BS    LOOK1                                                CMT02930
0B78            2632               293  LOOK3    AIS   R3,2               TRY NEXT HW                       CMT02940
0B7A            2662               294           AIS   R6,2                                                 CMT02950
0B7C            C530 0006          295           CLHI  R3,6               3 MATCHING HW FOUND ?             CMT02960
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0B80   208C            296          BLS   LOOK2                                    CMT02970
                       297  *                                                      CMT02980
0B82   C510 1936       298          CLHI  R1,RUN              RUN COMMAND ?        CMT02990
0B86   4330 0D86       299          BE    RUNIT                                    CMT03000
0B8A   C510 192A       300          CLHI  R1,OPTION           OPTION CMD ?         CMT03010
0B8E   4230 0CFC       301          BNE   LOOK4               NO, LOOK FURTHER     CMT03020
                       302  *-----------------------------                         CMT03030
                       303  *  TO PROCESS INPUT COMMAND 'OPTION'                   CMT03040
0B92   4820 1932       304          LH    R2,OPTION+8         CHECK FOR SPECIAL ROUTINE CMT03050
0B96   0232            305          BNZR  R2                  LINK TO ROUTINE      CMT03060
0B98   C830 17B6       306  OPTRTN  LHI   R3,TEST             RETURN HERE          CMT03070
0B9C   C8E0 0C22       307          LHI   R14,OPTCMD8                              CMT03080
0BA0   41F0 11A2       308          BAL   LINK,CRLF                                CMT03090
0BA4   0722            309  OPTCMD  XAR   R2,R2               RESET COUNTER        CMT03100
0BA6   D342 17B6       310  OPTCMD1 LB    R4,OPT(R2)          TO PRINT TEST        CMT03110
0BAA   41F0 11B0       311          BAL   LINK,OUTCHR                              CMT03120
0BAE   2621            312          AIS   R2,1                                     CMT03130
0BB0   C520 0006       313          CLHI  R2,6                                     CMT03140
0BB4   2087            314          BLS   OPTCMD1                                  CMT03150
0BB6   C840 0020       315          LHI   R4,C' '                                  CMT03160
0BBA   41F0 11B0       316          BAL   LINK,OUTCHR         OUTPUT 1 SPACE       CMT03170
0BBE   0755            317          XAR   R5,R5               TO PRINT SELECTED TEST NUMBERS CMT03180
0BC0   4050 16C2       318          STH   R5,FIRST                                 CMT03190
0BC4   4823 0006       319          LH    R2,6(R3)            FIRST TEST WORD      CMT03200
0BC8   2440            320  OPTCMD2 LIS   R4,0                START WITH TEST 0    CMT03210
0BCA   4040 3E3C       321          STH   R4,TEMP                                  CMT03220
0BCE   9121            322  OPTCMD3 SLHLS R2,1                                     CMT03230
0BD0   4380 0C02       323          BNC   OPTCMD7                                  CMT03240
0BD4   4040 3E3C       324  OPTCMD4 STH   R4,TEMP             OPTION VALUE FOUND.  CMT03250
0BD8   4800 16C2       325          LH    R0,FIRST            IS IT FIRST ?        CMT03260
0BDC   2335            326          BZS   OPTCMD5                                  CMT03270
0BDE   C840 002C       327          LHI   R4,C',              NO, OUTPUT COMMA     CMT03280
0BE2   41F0 11B0       328          BAL   LINK,OUTCHR                              CMT03290
0BE6   40F0 16C2       329  OPTCMD5 STH   LINK,FIRST                               CMT03300
0BEA   0855            330          LDAR  R5,R5               TEST VALUE FROM SECOND HW CMT03310
0BEC   2335            331          BZS   OPTCMD6             NO                   CMT03320
0BEE   C840 0031       332          LHI   R4,C'1'             YES,OUTPUT '1'       CMT03330
0BF2   41F0 11B0       333          BAL   LINK,OUTCHR                              CMT03340
0BF6   4840 3E3C       334  OPTCMD6 LH    R4,TEMP             RESTORE R4           CMT03350
0BFA   D344 171C       335          LB    R4,HEXTAB(R4)       CONVERT              CMT03360
0BFE   41F0 11B0       336          BAL   LINK,OUTCHR         OUTPUT 0-F           CMT03370
0C02   4840 3E3C       337  OPTCMD7 LH    R4,TEMP             RESTORE              CMT03380
0C06   2641            338          AIS   R4,1                INCREMENT TEST #     CMT03390
0C08   4040 3E3C       339          STH   R4,TEMP                                  CMT03400
0C0C   C540 0010       340          CLHI  R4,16                                    CMT03410
0C10   4280 0BCE       341          BL    OPTCMD3                                  CMT03420
0C14   0855            342  OPTCMD71 LDAR  R5,R5               DONE ?               CMT03430
0C16   023E            343          BNZR  R14                                      CMT03440
0C18   4823 0008       344          LH    R2,8(R3)            SECOND TEST WORD     CMT03450
0C1C   2451            345          LIS   R5,1                R5 = 1 FOR SECOND TEST HW CMT03460
0C1E   4300 0BC8       346          B     OPTCMD2                                  CMT03470
                       347  *-----------------------------------                   CMT03480
                       348  *  TO OUTPUT OTHER OPTION NAMES & VALUES               CMT03490
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                        349  *                                                                      CMT03500
0C22   41F0 11A2        350  OPTCMD8  BAL   LINK,CRLF                                               CMT03510
0C26   C820 17C2        351           LHI   R2,OPT+12          R2 POINTS TO THE NAME                CMT03520
                        352  *                                                                      CMT03530
                        353  **** PRWRITE AND PRREAD ROUTINES PRINT 20 BIT ADDRESSES FOR         **  CMT03540
                        354  **** 32 BIT MACHINES                                                **  CMT03550
                        355  *                                                                   **  CMT03560
0C2A   4850 16C4        356  CHECNUM  LH    R5,MOD32           IF NOT 32 BIT MACHINE THEN BRANCH**  CMT03570
0C2E   4330 0C9F        357           BZ    OPT555             AND ALLOW REGULAR ETPE TO PRINT  **  CMT03580
0C32   0755             358  PRWRITE  XHR   R5,R5              .                                **  CMT03590
0C34   D345 17CE        359           LB    R4,MWRITE(R5)      .                                **  CMT03600
0C38   41F0 11B0        360           BAL   LINK,OUTCHR        .                                **  CMT03610
0C3C   2651             361           AIS   R5,1               .                                **  CMT03620
0C3E   C550 0006        362           CLHI  R5,6               .                                **  CMT03630
0C42   2037             363           BNES  PRWRITE+2          .                                **  CMT03640
0C44   C840 0020        364           LHI   R4,C' '            .                                **  CMT03650
0C48   41F0 11B0        365           BAL   LINK,OUTCHR        .                                **  CMT03660
0C4C   2401             366           LIS   R0,1               .                                **  CMT03670
0C4E   D350 17D9        367           LB    R5,MWRITE+11       .                                **  CMT03680
0C52   41F0 10DA        368           BAL   LINK,R5HEX         .                                **  CMT03690
0C56   2404             369           LIS   R0,4               .                                **  CMT03700
0C58   4850 17D4        370           LH    R5,MWRITE+6        .                                **  CMT03710
0C5C   41F0 10DA        371           BAL   LINK,R5HEX         .                                **  CMT03720
0C60   41F0 11A2        372           BAL   LINK,CRLF          .                                **  CMT03730
0C64   0755             373  PRREAD   XHR   R5,R5              .                                **  CMT03740
0C66   D345 17C2        374           LB    R4,MREAD(R5)       .                                **  CMT03750
0C6A   41F0 11B0        375           BAL   LINK,OUTCHR        .                                **  CMT03760
0C6E   2651             376           AIS   R5,1               .                                **  CMT03770
0C70   C550 0006        377           CLHI  R5,6               .                                **  CMT03780
0C74   2037             378           BNES  PRREAD+2           .                                **  CMT03790
0C76   C840 0020        379           LHI   R4,C' '            .                                **  CMT03800
0C7A   41F0 11B0        380           BAL   LINK,OUTCHR        .                                **  CMT03810
0C7E   2401             381           LIS   R0,1               .                                **  CMT03820
0C80   D350 17CD        382           LB    R5,MREAD+11        .                                **  CMT03830
0C84   41F0 10DA        383           BAL   LINK,R5HEX         .                                **  CMT03840
0C88   2404             384           LIS   R0,4               .                                **  CMT03850
0C8A   4850 17C8        385           LH    R5,MREAD+6         .                                **  CMT03860
0C8E   41F0 10DA        386           BAL   LINK,R5HEX         .                                **  CMT03870
0C92   41F0 11A2        387           BAL   LINK,CRLF          .                                **  CMT03880
0C96   2461             388           LIS   R6,1               .                                **  CMT03890
0C98   C820 17DA        389           LHI   R2,OPT+36          .                                **  CMT03900
0C9C   2302             390           BS    OPTCMD9            .                                **  CMT03910
0C9E   2461             391  OPT555   LIS   R6,1               .                                **  CMT03920
0CA0   2436             392  OPTCMD9  LIS   R3,6                                                 CMT03930
0CA2   D342 0000        393  OPTCMD10 LB    R4,0(R2)                                             CMT03940
0CA6   41F0 11B0        394           BAL   LINK,OUTCHR        OUTPUT OPTION NAME CHAR              CMT03950
0CAA   2621             395           AIS   R2,1                                                  CMT03960
0CAC   2731             396           SIS   R3,1               6 CHARACTERS OUTPUT ?                CMT03970
0CAE   2026             397           BPS   OPTCMD10           NO,LOOP                              CMT03980
0CB0   C840 0020        398           LHI   R4,C' '                                               CMT03990
0CB4   41F0 11B0        399           BAL   LINK,OUTCHR        OUTPUT ONE SPACE                     CMT04000
0CB8   4852 0000        400           LH    R5,0(R2)           R5 = OPTION VALUE                    CMT04010
0CBC   2404             401           LIS   R0,4                                                   CMT04020
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0CBE  41F0 10DA   402           BAL   LINK,R5HEX        WRITE OPTION VALUE IN HEX (4 DIGITS)   CMT04030
0CC2  2661        403           AIS   R6,1              INCREMENT LINE COUNTER.                CMT04040
0CC4  C560 0014   404           CLHI  R6,20             PAGE FULL ?                            CMT04050
0CC8  218C        405           BLS   OPTCMD12          NO                                     CMT04060
0CCA  0766        406           XAR   R6,R6             INITIALIZE LINE COUNT                  CMT04070
0CCC  2440        407           LIS   R4,X'0'           OUTPUT NULL                            CMT04080
0CCE  41F0 11B0   408           BAL   LINK,OUTCHR       TO CONSOLE                             CMT04090
0CD2  41E0 121C   409 OPTCMD11 BAL   LINK,GETCHR                                               CMT04100
0CD6  274D        410           SIS   R4,13             CR ?                                   CMT04110
0CD8  4330 0AE6   411           BZ    OPTIN             TO ACCEPT NEXT COMMAND                 CMT04120
0CDC  2643        412           AIS   R4,3              LF ?                                   CMT04130
0CDE  2036        413           BNZS  OPTCMD11          IF YES, PRINT NEXT PAGE                CMT04140
0CE0  41F0 11A2   414 OPTCMD12 BAL   LINK,CRLF                                                 CMT04150
0CE4  41F0 126A   415           BAL   LINK,TSTBRK       EXIT IF 'BREAK' PRESSED.               CMT04160
0CE8  2626        416           AIS   R2,6                                                     CMT04170
0CEA  C520 192A   417           CLHI  R2,OPTEND2        ALL PRINTING OPTIONS DONE ?            CMT04180
0CEE  4280 0CA0   418           BL    OPTCMD9           NO,LOOP FOR NEXT ONE                   CMT04190
0CF2  2440        419           LIS   R4,X'0'           OUTPUT NULL                            CMT04200
0CF4  41F0 11B0   420           BAL   LINK,OUTCHR       TO CONSOLE                             CMT04210
0CF8  4300 0AEA   421           B     OPTIN1            TO ACCEPT NEXT COMMAND                 CMT04220
                  422 *---------------------------                                             CMT04230
                  423 *  TO PROCESS COMMANDS OTHER THAN 'TEST', 'OPTION'.                      CMT04240
                  424 *                                                                        CMT04250
0CFC  C510 17B6   425 LOOK4    CLHI  R1,TEST           'TEST' OPTION ?                        CMT04260
0D00  4330 0D34   426           BE    TESTOP                                                   CMT04270
0D04  C510 1942   427           CLHI  R1,CON                                                   CMT04280
0D08  2134        428           BNES  LOOK4A                                                   CMT04290
0D0A  8800        429           DCX   8800                                                     CMT04300
0D0C  4300 0AE6   430           B     OPTIN                                                    CMT04310
0D10  274D        431 LOOK4A   SIS   R4,13             OPT FOLLOWED BY CR ?                   CMT04320
0D12  033C        432           BZR   R12               YES, ERROR                             CMT04330
0D14  41E0 1068   433           BAL   R14,OPTVAL        GET OPTION VALUE IN R6                 CMT04340
0D18  274D        434           SIS   R4,13             TERMINATED BY CR ?                     CMT04350
0D1A  023C        435           BNZR  R12               IF NO, BRANCH                          CMT04360
0D1C  48E1 0008   436           LH    R14,8(R1)         GET OPTION CHECK ROUTINE ADDRESS       CMT04370
0D20  2332        437           BZS   LOOK5                                                    CMT04380
0D22  01FE        438           BALR  R15,R14           LINK OPTION CHECK ROUTINE              CMT04390
      0000 0D24   439 LOOK5    EQU   *                 RETURN HERE                            CMT04400
0D24  4061 0006   440           STH   R6,6(R1)          STORE OPTION VALUE                     CMT04410
0D28  4300 0AE6   441           B     OPTIN             TO ACCEPT NEXT COMMAND                 CMT04420
                  442 *                                                                        CMT04430
0D2C  C560 0400   443 ADR      CLHI  R6,X'400'         (R6) = 10 BIT DEVICE ADDRESS           CMT04440
0D30  028F        444           BLR   R15               RETURN TO LOOK5                        CMT04450
0D32  030C        445           BR    R12                                                      CMT04460
                  446 *---------------------------                                             CMT04470
                  447 *  TEST OPTION PROCESS ROUTINE                                           CMT04480
                  448 *                                                                        CMT04490
0D34  274D        449 TESTOP    SIS   R4,13             'TEST' FOLLOWED BY (CR) ?              CMT04500
0D36  213B        450           BNZS  TSTOP1                                                   CMT04510
0D38  4800 1952   451           LH    R0,DEFTESTS       YES, SET TEST OPTION TO                CMT04520
0D3C  4000 17BC   452           STH   R0,TEST+6         FIRST TEST WORD                        CMT04530
0D40  4800 1954   453           LH    R0,DEFTESTS+2     ALL DEFAULT TESTS IN PROGRAM           CMT04540
0D44  4000 17BE   454           STH   R0,TEST+8         SECOND TEST WORD                       CMT04550
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0D48   4300 0AE6          455            B     OPTIN            TO ACCEPT NEXT COMMAND              CMT04560
                          456  *                                                                    CMT04570
0D4C   4850 1950          457  TSTOP1    LH    R5,MAXTST                                            CMT04580
0D50   2470               458            LIS   R7,0             TEST BIT ACCUMULATORS               CMT04590
0D52   2480               459            LIS   R8,0                                                 CMT04600
0D54   41E0 1068          460  TSTOP2    BAL   R14,OPTVAL       GET OPTION VALUE IN R6              CMT04610
0D58   0556               461            CLAR  R5,R6                                                CMT04620
0D5A   029C               462            BLR   R12              ERROR: INVALID TEST NUMBER          CMT04630
0D5C   C560 0010          463            CLHI  R6,16            R6 < 16 ?                           CMT04640
0D60   2385               464            BNLS  TSTOP3           NO                                  CMT04650
0D62   41E0 10B2          465            BAL   R14,UNARY        GET UNARY OPERAND IN R3             CMT04660
0D66   0673               466            OAR   R7,R3            SET CURRENT BIT                     CMT04670
0D68   2306               467            BS    TSTOP4                                               CMT04680
0D6A   C560 0010          468  TSTOP3    SHI   R6,16            R6 = 0-F                            CMT04690
0D6E   41E0 10B2          469            BAL   R14,UNARY                                            CMT04700
0D72   0683               470            OAR   R8,R3            SET CURRENT BIT                     CMT04710
0D74   274D               471  TSTOP4    SIS   R4,13            TERMINATED BY CR ?                  CMT04720
0D76   4230 0D54          472            BNZ   TSTOP2                                               CMT04730
0D7A   4C70 17BC          473            STH   R7,TEST+6        STORE VALID SELECTED TESTS          CMT04740
0D7E   4C80 17BE          474            STH   R8,TEST+8                                            CMT04750
0D82   4300 0AE6          475            B     OPTIN            TO ACCEPT NEXT COMMAND              CMT04760
                          476  *-----------------------------                                       CMT04770
                          477  *                                                                    CMT04780
       0000 0D86          478  RUNIT     EQU   *                                                    CMT04790
0D86   41F0 11A2          479            BAL   LINK,CRLF                                            CMT04800
0D8A   4800 0A10          480            LH    R0,IO                                                CMT04810
0D8E   4000 3E46          481            STH   R0,IOSAVE        RESTORE USER'S I/O CHOICE           CMT04820
0D92   41F0 11A2          482            BAL   LINK,CRLF                                            CMT04830
0D96   41F0 19A6          483            BAL   LINK,INIT        LINK USER INITIALIZATION ROUTINE    CMT04840
       0000 0D9A          484  INITRET   EQU   *                RETURN HERE                         CMT04850
0D9A   07FF               485            XAR   R15,R15                                              CMT04860
0D9C   40F0 1706          486            STH   R15,WASDU1                                           CMT04870
0DA0   240F               487            LIS   R0,15            TO FIND HIGHEST SELECTED TEST  NO.  CMT04880
0DA2   4810 17BE          488            LH    R1,TEST+8        CHECK SECOND TEST HW                CMT04890
0DA6   9011               489  KEEP1     SRLS  R1,1                                                 CMT04900
0DA8   218B               490            BCS   FOUND1           R0 = F-0                            CMT04910
0DAA   2701               491            SIS   R0,1                                                 CMT04920
0DAC   2213               492            BNMS  KEEP1            TRY NEXT DIGIT                      CMT04930
0DAE   240F               493            LIS   R0,15            INITIALIZE AGAIN                    CMT04940
0DB0   4810 17BC          494            LH    R1,TEST+6        CHECK FIRST TEST HW                 CMT04950
0DB4   9011               495  KEEP2     SRLS  R1,1                                                 CMT04960
0DB6   2186               496            BCS   FOUND1+4         R0 = F-0 = TEST #                   CMT04970
0DB8   2701               497            SIS   R0,1                                                 CMT04980
0DBA   2213               498            BNMS  KEEP2            LOOP                                CMT04990
0DBC   030C               499            BR    R12              TEST NOT SELECTED                   CMT05000
0DBE   CA00 0010          500  FOUND1    AHI   R0,16            ADJUST TEST # FOR SECOND HW         CMT05010
0DC2   4000 1702          501            STH   R0,SELTST        HIGHEST SELECTED TEST NUMBER        CMT05020
                          502  *                                                                    CMT05030
                          503  *  RESET TEST PARAMETERS                                            CMT05040
                          504  *                                                                    CMT05050
0DC6   0700               505            XAR   R0,R0                                                CMT05060
0DC8   4000 16FE          506            STH   R0,ISITERR       RESET ERROR FLAG                    CMT05070
0DCC   4000 1708          507            STH   R0,TOTAL         RESET TOTAL                         CMT05080
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0DD0  4000 170A      508            STH   R0,TOTERR          RESET TOTERR                          CMT05090
0DD4  4000 1704      509            STH   R0,WASDU           RESET WASDU                           CMT05100
0DD8  C810 3030      510            LHI   R1,C'00'                                                 CMT05110
0DDC  4010 1732      511            STH   R1,MTESTNO         RESET THESE FLAGS TO C'00'            CMT05120
0DE0  4010 173C      512            STH   R1,ETESTNO                                               CMT05130
0DE4  4010 173E      513            STH   R1,ERRNO                                                 CMT05140
0DE8  41F0 1360      514            BAL   LINK,LCORE         SET UP LOW CORE                       CMT05150
                     515  *                                                                        CMT05160
                     516  *  START SELECTION FROM TEST 0                                           CMT05170
                     517  *                                                                        CMT05180
0DEC  0700           518  KEEP3     XAR   R0,R0                                                    CMT05190
0DEE  4000 170C      519            STH   R0,BTESTNO         RESET BINARY TEST NUMBER              CMT05200
0DF2  4000 1710      520            STH   R0,NEXTST          RESET NEXT TEST #                     CMT05210
                     521  *                                                                        CMT05220
                     522  *  TO FIND THE NEXT SELECTED TEST.                                       CMT05230
                     523  *                                                                        CMT05240
0DF6  4820 1710      524  KEEP4     LH    R2,NEXTST          GET NEXT TEST #                       CMT05250
0DFA  2408           525  KEEP41    LIS   R0,8                                                     CMT05260
0DFC  910C           526            SLHLS R0,12              R0 = X'8000'                          CMT05270
0DFE  CC02 0000      527            SRHL  R0,0(R2)           R0 = NEXT TEST BIT                    CMT05280
0E02  C520 0010      528            CLHI  R2,X'10'           NEXT TEST < 16                        CMT05290
0E06  2185           529            BLS   KEEP42                                                   CMT05300
0E08  4400 17BE      530            NH    R0,TEST+8          LOOK AT TEST HW 2                     CMT05310
0E0C  2137           531            BNZS  KEEP5                                                    CMT05320
0E0E  2304           532            BS    KEEP43                                                   CMT05330
0E10  4400 17BC      533  KEEP42    NH    R0,TEST+6          LOOK AT TEST HW 1                     CMT05340
0E14  2133           534            BNZS  KEEP5                                                    CMT05350
0E16  2621           535  KEEP43    AIS   R2,1                                                     CMT05360
0E18  220F           536            BS    KEEP41             LOOP FOR NEXT TEST #                  CMT05370
0E1A  4020 170C      537  KEEP5     STH   R2,BTESTNO         CURRENT TEST #                        CMT05380
0E1E  0812           538            LDAR  R1,R2              R1 = TEST # IN BINARY                 CMT05390
0E20  2621           539            AIS   R2,1                                                     CMT05400
0E22  4020 1710      540            STH   R2,NEXTST                                                CMT05410
0E26  2402           541            LIS   R0,2               SET DIGITS TO PRINT = 2               CMT05420
0E28  C820 1732      542            LHI   R2,MTESTNO         R2 = A(MTESTNO)                       CMT05430
0E2C  41F0 1102      543            BAL   LINK,HEXASC        STORE TEST # IN ASCII @ MTESTNO       CMT05440
0E30  4820 1732      544            LH    R2,MTESTNO                                               CMT05450
0E34  4020 173C      545            STH   R2,ETESTNO         STORE TEST # IN ASCII @ ETESTNO       CMT05460
0E38  41F0 126A      546            BAL   LINK,TSTBRK        TEST BREAK                            CMT05470
0E3C  C850 172C      547            LHI   R5,TSTMSG                                                CMT05480
0E40  41F0 112A      548            BAL   LINK,PRINT         PRINT 'TEST NN'                       CMT05490
0E44  0700           549            XAR   R0,R0                                                    CMT05500
0E46  4000 1700      550            STH   R0,NOERR           RESET ERROR FLAG                      CMT05510
0E4A  4000 170E      551            STH   R0,COUNT           RESET COUNT                           CMT05520
0E4E  4810 0A24      552  KEEP6     LH    R1,PSW2            DISABLE INTERRUPTS                 **  CMT05530
0E52  9501           553            EPSR  R0,R1                                                    CMT05540
0E54  4820 170C      554            LH    R2,BTESTNO         R2 = TEST #                           CMT05550
0E58  9121           555            SLLS  R2,LADC                                                  CMT05560
0E5A  4812 1956      556            LDA   R1,TESTS(R2)                                             CMT05570
0E5E  0301           557            BR    R1                 GO TO TEST MODULE                     CMT05580
                     558  *-----------------------------                                          CMT05590
                     559  *                                                                        CMT05600
                     560  *  TEST MODULE END ROUTINE                                               CMT05610
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                        561  *                                                                      CMT05620
      0000 0E60         562  TSTEND   EQU   *                                                       CMT05630
0E60  4810 0A24         563           LH    R1,PSW2                                                 CMT05640
0E64  9501              564           EPSR  R0,R1             DISABLE INT @ PROCESSOR LEVEL           CMT05650
0E66  4800 170E         565           LH    R0,COUNT                                                CMT05660
0E6A  2601              566           AIS   R0,1              INCREMENT COUNT                         CMT05670
0E6C  4000 170E         567           STH   R0,COUNT                                                CMT05680
0E70  4500 17E0         568           CLH   R0,LOOP+6         IF COUNT > LOOP,                        CMT05690
0E74  2385              569           BNLS  KEEP7             GO TO NEXT TEST MODULE                  CMT05700
0E76  41F0 126A         570           BAL   LINK,TSTBRK       IF BREAK GO TO OPTIN                    CMT05710
0E7A  4300 0E4E         571           B     KEEP6             OTHERWISE, REPEAT SAME TEST             CMT05720
0E7E  4800 1700         572  KEEP7    LH    R0,NOERR          LOOK @ ERROR FLAG                       CMT05730
0E82  2135              573           BNZS  KEEP71                                                  CMT05740
0E84  C850 1752         574           LHI   R5,NOERMSG                                              CMT05750
0E88  41F0 112A         575           BAL   LINK,PRINT        PRINT "NO ERROR"                        CMT05760
0E8C  4810 170C         576  KEEP71   LH    R1,BTESTNO        GET TEST #                              CMT05770
0E90  4510 1702         577           CLH   R1,SELTST         IS THE LAST SELECTED TEST DONE ?        CMT05780
0E94  4280 0DF6         578           BL    KEEP4             NO, GO SELECT NEXT TEST                 CMT05790
                        579  *                                                                      CMT05800
                        580  *  ALL THE SELECTED TESTS ARE NOW RUN                                  CMT05810
                        581  *                                                                      CMT05820
      0000 0E98         582  ABORT    EQU   *                 COME HERE TO ABORT TEST SEQUENCE.       CMT05830
0E98  4200 0000         583           NOP                                                           CMT05840
0E9C  41E0 12DE         584           BAL   LINK,TSTDU        RETURN WITH R1 = DU BIT                 CMT05850
0EA0  4230 0EC8         585           BNZ   KEEP9             IF DU, DISPLAY TOTAL                    CMT05860
0EA4  4810 1706         586           LH    R1,WASDU1         WAS IT EVER ?                           CMT05870
0EA8  4230 0F10         587           BNZ   KEEP10            YES, PRINT TOTAL, TOTERR                CMT05880
0EAC  41F0 126A         588           BAL   LINK,TSTBRK                                             CMT05890
0EB0  4810 17EC         589           LH    R1,CONTIN+6       IF CONTIN = 1,                          CMT05900
0EB4  4230 0DEC         590           BNZ   KEEP3             GO TO TEST 0                            CMT05910
0EB8  41F0 1304         591           BAL   LINK,SETKB        KB DEVICE = LIST DEVICE                 CMT05920
0EBC  C850 17A4         592           LHI   R5,EOTMSG                                               CMT05930
0EC0  41F0 112A         593           BAL   LINK,PRINT        'END OF TEST'                           CMT05940
0EC4  4300 0AE6         594           B     OPTIN                                                   CMT05950
                        595  *---------------------------------                                    CMT05960
                        596  *  ROUTINE INCREMENTS,DISPLAYS & CHECKS 'TOTAL'                        CMT05970
                        597  *                                                                      CMT05980
0EC8  4010 1704         598  KEEP9    STH   R1,WASDU          SET 'WASDU' FLAG                        CMT05990
0ECC  4810 1708         599           LH    R1,TOTAL          INCREMENT TOTAL                         CMT06000
0ED0  2611              600           AIS   R1,1                                                    CMT06010
0ED2  4010 1708         601           STH   R1,TOTAL                                                CMT06020
0ED6  2421              602  KEEP91   LIS   R2,1                                                    CMT06030
0ED8  DE20 16D5         603           OC    R2,INCR           DISPLAY: INCREMENTAL MODE               CMT06040
0EDC  4800 170A         604           LH    R0,TOTERR                                               CMT06050
0EE0  9400              605           EXBR  R0,R0                                                   CMT06060
0EE2  9820              606           WHR   R2,R0             DISPLAY TOTERR                          CMT06070
0EE4  9401              607           EXBR  R0,R1             FORMAT FOR DISPLAY                      CMT06080
0EE6  9820              608           WHR   R2,R0             DISPLAY TOTAL                           CMT06090
0EE8  DE20 16D4         609           OC    R2,NORM           DISPLAY: NORMAL MODE                    CMT06100
0EEC  C510 7FFF         610           CLHI  R1,X'7FFF'        TOTAL < MAX RETAINABLE ?                CMT06110
0EF0  2389              611           BNLS  HALT9                                                   CMT06120
0EF2  4800 170C         612           LH    R0,BTESTNO        R0 = CURRENT TEST #                     CMT06130
0EF6  4500 1702         613           CLH   R0,SELTST         IS IT LAST TEST ?                       CMT06140
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0EFA  4280 0DF6          614          BL    KEEP4              NO, GO TO NEXT TEST                    CMT06150
0EFE  4300 0DEC          615          B     KEEP3              GO TO TEST 0                           CMT06160
                         616  *                                                                        CMT06170
0F02  C810 080F          617  HALT9   LHI   R1,X'80F'                                                 CMT06180
0F06  9114               618          SLHLS R1,4               (R1) = X'80F0'                         CMT06190
0F08  9521               619          EPSR  R2,R1              HALT PROCESSOR                         CMT06200
                         620  *                                                                        CMT06210
                         621  *  WHEN EXE/RUN IS PRESSED, PRINT TOTAL & TOTERR                         CMT06220
                         622  *                                                                        CMT06230
0F0A  41F0 12DE          623          BAL   LINK,TSTDU         SEE IF LIST DEV IS ON                  CMT06240
0F0E  2036               624          BNZS  HALT9              NO, HALT                               CMT06250
0F10  0700               625  KEEP10  XAR   R0,R0                                                      CMT06260
0F12  4000 1704          626          STH   R0,WASDU           RESET FLAG                             CMT06270
0F16  41F0 11A2          627          BAL   LINK,CRLF                                                  CMT06280
0F1A  C850 1742          628          LHI   R5,TOTMSG                                                  CMT06290
0F1E  4050 16FE          629          STH   R5,ISITERR                                                 CMT06300
0F22  41F0 112A          630          BAL   LINK,PRINT         PRINT 'TOTAL   TOTERR'                 CMT06310
0F26  2404               631          LIS   R0,4               TO PRINT 4 HEX DIGITS                  CMT06320
0F28  4850 1708          632          LH    R5,TOTAL                                                   CMT06330
0F2C  41F0 10DA          633          BAL   LINK,R5HEX         PRINT TOTAL IN HEX                     CMT06340
0F30  2434               634          LIS   R3,4                                                       CMT06350
0F32  C840 0020          635          LHI   R4,C' '            SPACE                                  CMT06360
0F36  41F0 11B0          636  KEEP101 BAL   LINK,OUTCHR        OUTPUT IT                              CMT06370
0F3A  2731               637          SIS   R3,1                                                       CMT06380
0F3C  2023               638          BPS   KEEP101            4 TIMES                                CMT06390
0F3E  2404               639          LIS   R0,4               TO PRINT 4 HEX DIGITS                  CMT06400
0F40  4850 170A          640          LH    R5,TOTERR                                                  CMT06410
0F44  41F0 10DA          641          BAL   LINK,R5HEX         PRINT TOTERR IN HEX                    CMT06420
0F48  4300 0AE6          642          B     OPTIN              GO TO BEGINNING                        CMT06430
                         643  * ********************************                                        CMT06440
                         644  *  ERROR ROUTINES                (OVERRIDE NOMSG OPTION)                CMT06450
                         645  *                                                                        CMT06460
0F4C  D000 3FC8          646  ERR     STM   R0,ERRSAVE         STORE REGISTERS                        CMT06470
0F50  4120 0FB2          647          BAL   R2,ERRCOM          RETURN IF LIST DEVICE IS ON            CMT06480
0F54  41E0 0FE4          648          BAL   RET,ERR1           PRINT 'ERROR TTNN'                     CMT06490
0F58  0700               649  ERRCOM2 XAR   R0,R0                                                      CMT06500
0F5A  4000 16FE          650          STH   R0,ISITERR         RESET ERROR FLAG                       CMT06510
0F5E  4820 0A24          651          LH    R2,PSW2            ***                                    CMT06520
0F62  9502               652          EPSR  R0,R2                                                      CMT06530
0F64  D100 3FC8          653          LM    R0,ERRSAVE         RESTORE REGISTERS                      CMT06540
0F68  030F               654          BR    LINK               RETURN TO TEST                         CMT06550
0F6A  4000 173E          655  ERRD    STH   R0,ERRNO           SAVE ERROR NUMBER                 **   CMT06560
0F6E  D000 3FC8          656          STM   R0,ERRSAVE         STORE REGISTERS                        CMT06570
0F72  4120 0FB2          657          BAL   R2,ERRCOM          RETURN IF LIST DEVICE IS ON            CMT06580
0F76  41E0 0FE4          658          BAL   RET,ERR1           PRINT 'ERROR TTNN'                     CMT06590
0F7A  41E0 0FEE          659          BAL   RET,ERRD1          PRINT 'DEV DDD'                        CMT06600
0F7E  4300 0F58          660          B     ERRCOM2                                                    CMT06610
0F82  D000 3FC8          661  ERRDS   STM   R0,ERRSAVE         STORE REGISTERS                        CMT06620
0F86  41E0 33F2          662          BAL   RET,ERRDSA         SET UP ERROR NUM AND STATUS BYTE **    CMT06630
0F8A  4120 0FB2          663          BAL   R2,ERRCOM          RETURN IF LIST DEVICE IS ON            CMT06640
0F8E  41E0 0FE4          664          BAL   RET,ERR1           PRINT 'ERROR TTNN'                     CMT06650
0F92  41E0 101E          665          BAL   RET,ERRDS1         PRINT 'DEV DDD STA SS'                 CMT06660
0F96  4300 0F58          666          B     ERRCOM2                                                    CMT06670
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0F9A  D000 3FC8   667 ERRALL  STM   R0,ERRSAVE       STORE REGISTERS                        CMT06680
0F9E  4120 0FB2   668          BAL   R2,ERRCOM        RETURN IF LIST DEVICE IS ON            CMT06690
0FA2  41E0 0FE4   669          BAL   RET,ERR1         PRINT 'ERROR TTNN'                     CMT06700
0FA6  41E0 101E   670          BAL   RET,ERRDS1       PRINT 'DEV DDD STA SS'                 CMT06710
0FAA  41E0 1044   671          BAL   RET,ERRPL1       PRINT 'PSW PPPP  LOC LILL'             CMT06720
0FAE  4300 0F58   672          B     ERRCOM2                                                 CMT06730
                  673 *                                                                       CMT06740
                  674 *  COMMON ERROR ROUTINE                                               CMT06750
                  675 *                                                                       CMT06760
0FB2  4020 0FCC   676 ERRCOM  STH   R2,COMRET                                                 CMT06770
0FB6  4810 0A24   677          LH    R1,PSW2                                                 CMT06780
0FBA  95C1        678          EPSR  R0,P1            DISABLE INT. @ PROCESSOR LEVEL         CMT06790
0FBC  41F0 12DE   679          BAL   LINK,TSTDU       GET LIST DEVICE DU BIT IN R1           CMT06800
0FC0  2137        680          BNZS  ERRCOM1          BRANCH IF OFF-LINE                     CMT06810
0FC2  4020 16FE   681          STH   R2,ISITERR       SET ERROR FLAG                         CMT06820
0FC6  4020 1700   682          STH   R2,NOERR                                                 CMT06830
0FCA  4300 0FCA   683          B     *                GO, PRINT ERROR MESSAGE                CMT06840
      0000 0FCC   684 COMRET  EQU   *-2                                                      CMT06850
                  685 *                                                                       CMT06860
0FCE  4810 170A   686 ERRCOM1 LH    R1,TOTERR        LIST DEVICE IS OFF                     CMT06870
0FD2  2611        687          AIS   R1,1                                                    CMT06880
0FD4  4010 170A   688          STH   R1,TOTERR        INCREMENT TOTERR                       CMT06890
0FD8  C510 7FFF   689          CLHI  R1,X'7FFF'       TOTERR < MAX RETAINABLE ?              CMT06900
0FDC  4280 0ED6   690          BL    KEEP91           NO, ABORT CURRENT TEST & GOTO NEXT     CMT06910
0FE0  4300 0F02   691          B     HALT9            YES, HALT PROCESSOR                    CMT06920
                  692 *--------------------------                                            CMT06930
                  693 * MESSAGE PRINT ROUTINES        (DO NOT OVERRIDE NOMSG OPTION)         CMT06940
                  694 *                                                                       CMT06950
                  695 *  TO PRINT 'ERROR TTNN'                                              CMT06960
                  696 *                                                                       CMT06970
0FE4  C850 1736   697 ERR1     LHI   R5,ERRMSG                                               CMT06980
0FE8  41F0 112A   698          BAL   LINK,PRINT       PRINT 'ERROR TTNN'                     CMT06990
                  699 *                                TT = TEST #, NN = ERROR #              CMT07000
0FEC  030E        700          BR    RET              RETURN                                 CMT07010
                  701 *                                                                       CMT07020
                  702 *  TO PRINT 'DEV DDD'                                                 CMT07030
                  703 *                                                                       CMT07040
0FEE  2403        704 ERRD1    LIS   R0,3             SET UP DIGITS = 3                      CMT07050
0FF0  4810 16D0   705          LH    R1,ERRDEV        R1 = ERROR DEV # IN BINARY             CMT07060
0FF4  C820 1770   706          LHI   R2,ASCIDEV2                                             CMT07070
0FF8  41F0 1102   707          BAL   LINK,HEXASC      CONVERT IT TO ASCII                    CMT07080
0FFC  C850 176C   708          LHI   R5,DEVMSG2                                              CMT07090
1000  41F0 112A   709          BAL   LINK,PRINT       PRINT 'DEV DD'                         CMT07100
1004  030E        710          BR    RET              RETURN                                 CMT07110
                  711 *                                                                       CMT07120
                  712 *  TO PRINT 'STA SS'                                                  CMT07130
                  713 *                                                                       CMT07140
1006  2402        714 ERRS1    LIS   R0,2             SET UP DIGITS = 2                      CMT07150
1008  D310 16D2   715          LB    R1,ERRSTA        R1 = ERROR STATUS                      CMT07160
100C  C820 1768   716          LHI   R2,ASCISTA                                              CMT07170
1010  41F0 1102   717          BAL   LINK,HEXASC      CONVERT IT TO ASCII                    CMT07180
1014  C850 1764   718          LHI   R5,STAMSG                                               CMT07190
1018  41F0 112A   719          BAL   LINK,PRINT       PRINT 'STA SS'                         CMT07200
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101C  030E                  BR    RET                 RETURN                                CMT07210
                    *                                                                       CMT07220
                    *  TO PRINT 'DEV DDD STA SS'                                            CMT07230
                    *                                                                       CMT07240
101E  2403          ERRDS1  LIS   R0,3                SET UP DIGITS = 3                     CMT07250
1020  4810 16D0             LH    R1,ERRDEV           R1 = ERROR DEV #                      CMT07260
1024  C820 1760             LHI   R2,ASCIDEV                                                CMT07270
1028  41F0 1102             BAL   LINK,HEXASC         CONVERT IT TO ASCII                   CMT07280
102C  2402                  LIS   R0,2                SET UP DIGITS = 2                     CMT07290
102E  D310 16D2             LB    R1,ERRSTA           R1 = ERROR STATUS                     CMT07300
1032  C820 1768             LHI   R2,ASCISTA                                                CMT07310
1036  41F0 1102             BAL   LINK,HEXASC         CONVERT IT TO ASCII                   CMT07320
103A  C850 175C             LHI   R5,DEVMSG                                                 CMT07330
103E  41F0 112A             BAL   LINK,PRINT          PRINT 'DEV DD STA SS'                 CMT07340
1042  030E                  BR    RET                 RETURN                                CMT07350
                    *                                                                       CMT07360
                    *  TO PRINT 'PSW PPPP  LOC LLLL'                                        CMT07370
                    *                                                                       CMT07380
1044  2404          ERRPL1  LIS   R0,4                SET UP DIGITS = 4                     CMT07390
1046  4810 16CA             LH    R1,OPSW             R1 = OLD PSW                          CMT07400
104A  C820 177A             LHI   R2,ASCIPSW                                                CMT07410
104E  41F0 1102             BAL   LINK,HEXASC         CONVERT IT TO ASCII                   CMT07420
1052  4810 16CE             LH    R1,OLOC             R1= OLD LOC                           CMT07430
1056  C820 1784             LHI   R2,ASCILOC                                                CMT07440
105A  41F0 1102             BAL   LINK,HEXASC         CONVERT IT TO ASCII                   CMT07450
105E  C850 1776             LHI   R5,PSWMSG                                                 CMT07460
1062  41F0 112A             BAL   LINK,PRINT          PRINT 'PSW PPPP  LOC LLLL'            CMT07470
1066  030E                  BR    RET                 RETURN                                CMT07480
                    * ***********************************                                   CMT07490
                    *  TO OBTAIN OPTION VALUE IN R6   (16 BITS, TARGT 16)                   CMT07500
                    *                                                                       CMT07510
1068  0766          OPTVAL  XAR   R6,R6               INITIALIZE ACCUMULATOR                CMT07520
106A  41F0 121C             BAL   R15,GETCHR          GET A CHAR IN R4                      CMT07530
106E  24FF          OPTVAL0 LIS   R15,15                                                    CMT07540
1070  D44F 171C     OPTVAL1 CLB   R4,HEXTAB(R15)      SCAN TABLE                            CMT07550
1074  2334                  BES   OPTVAL2             MATCH                                 CMT07560
1076  27F1                  SIS   R15,1                                                     CMT07570
1078  2214                  BNMS  OPTVAL1                                                   CMT07580
107A  030C                  BR    R12                 ERROR; VALUE NOT IN TABLE.            CMT07590
107C  4890 16C4     OPTVAL2 LH    R9,MOD32            .                          **         CMT07600
1080  2133                  BNZS  OPTVAL5             .                          **         CMT07610
1082  9164                  SLLS  R6,4                .                          **         CMT07620
1084  2302                  BS    OPTVAL6             .                          **         CMT07630
1086  1164          OPTVAL5 DC    X'1164'             .                          **         CMT07640
1088  066F          OPTVAL6 OAR   R6,R15              .                          **         CMT07650
108A  41F0 121C     OPTVAL3 BAL   R15,GETCHR          GET NEXT CHAR                         CMT07660
108E  C540 005F             CLHI  R4,X'5F'            IS IT LEFT ARROW ?                    CMT07670
1092  2138                  BNES  OPTVAL4                                                   CMT07680
1094  4890 16C4             LH    R9,MOD32            .                          **         CMT07690
1098  2133                  BNZS  OPTVAL7             .                          **         CMT07700
109A  9064                  SRLS  R6,4                .                          **         CMT07710
109C  2302                  BS    OPTVAL8             .                          **         CMT07720
109E  1064          OPTVAL7 DC    X'1064'             .                          **         CMT07730
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10A0  220B           773  OPTVAL8  BS    OPTVAL3              .                          **  CMT07740
10A2  C540 000D      774  OPTVAL4  CLHI  R4,13               EXIT IF CR                     CMT07750
10A6  033E           775           BER   R14                                               CMT07760
10A8  C540 002C      776           CLHI  R4,X'2C'            OR COMMA                       CMT07770
10AC  4230 106E      777           BNE   OPTVAL0             LOOP TO PROCESS                CMT07780
10B0  030E           778           BR    R14                 RETURN                         CMT07790
                     779  *-----------------------------------                             CMT07800
                     780  * TO CONVERT (R6) FROM BINARY TO UNARY PATTERN, IN R3             CMT07810
                     781  *                                                                 CMT07820
10B2  2431           782  UNARY    LIS   R3,1                INITIALIZE                     CMT07830
10B4  C560 000F      783  UNARY1   CLHI  R6,15               DONE ?                         CMT07840
10B8  033E           784           BER   R14                 RETURN                         CMT07850
10BA  0A33           785           AAR   R3,R3               NO. SHIFT R3.                  CMT07860
10BC  2661           786           AIS   R6,1                INCREMENT COUNTER              CMT07870
10BE  2205           787           BS    UNARY1                                           CMT07880
                     788  *-----------------------------                                   CMT07890
                     789  *  TO PROVIDE # OF MILLISECONDS DELAY SPECIFIED BY R0            CMT07900
                     790  *                                                                 CMT07910
10C0  D0C0 3F08      791  TIMER    STM   R0,RSAVE            SAVE REGISTERS                 CMT07920
10C4  2410           792           LIS   R1,0                                               CMT07930
10C6  2421           793           LIS   R2,1                                               CMT07940
10C8  4830 0A1E      794           LH    R3,TIME             R3 = TIME CONSTANT FOR 1 MS DELAY  CMT07950
10CC  C110 10CC      795           BXLE  R1,*                                               CMT07960
10D0  2701           796           SIS   R0,1                                               CMT07970
10D2  2037           797           BNZS  TIMER+4             LOOP TILL SPECIFIED DELAY      CMT07980
10D4  D100 3F08      798           LM    R0,RSAVE            RESTORE REGISTERS              CMT07990
10D8  030F           799  TIMXT    BR    LINK                RETURN                         CMT08000
                     800  *-----------------------------                                   CMT08010
                     801  *  R5HEX PRINTS CONTENTS OF R5 IN HEX                            CMT08020
                     802  *        PRINTS UPTO 4 DIGITS      (8 DIGITS, TARGT 32)           CMT08030
                     803  *                                                                 CMT08040
10DA  D000 3F08      804  R5HEX    STM   R0,RSAVE            STORE REGISTERS                CMT08050
10DE  0820           805           LDAR  R2,R0               R2 = # OF DIGITS TO BE PRINTED  CMT08060
10E0  2721           806           SIS   R2,1                                               CMT08070
10E2  211D           807           BMS   R5XB                                               CMT08080
10E4  9122           808           SLLS  R2,2                R2 = 4(DIGITS-1)               CMT08090
10E6  0845           809  R5X      LDAR  R4,R5                                              CMT08100
10E8  CC42 0000      810           SRAL  R4,0(R2)                                           CMT08110
10EC  C440 000F      811           NHI   R4,15               R4 = HEX DIGIT                 CMT08120
10F0  D344 171C      812           LB    R4,HEXTAB(R4)                                    CMT08130
10F4  41F0 11B0      813  R5XA     BAL   R15,OUTCHR                                         CMT08140
10F8  2724           814           SIS   R2,4                                               CMT08150
10FA  221A           815           BNMS  R5X                 LOOP TILL ALL DIGITS           CMT08160
10FC  D100 3F08      816  R5XB     LM    R0,RSAVE            RESTORE REGISTERS              CMT08170
1100  030F           817           BR    LINK                RETURN                         CMT08180
                     818  *-----------------------------                                   CMT08190
                     819  *  TO CONVERT HEXADECIMAL DATA IN R1 TO ASCII CHAR & STORE @ 0(R2)  CMT08200
                     820  *                                                                 CMT08210
1102  D000 3F08      821  HEXASC   STM   R0,RSAVE            STORE REGISTERS                CMT08220
1106  0830           822           LDAR  R3,R0               R3 = DIGITS                    CMT08230
1108  9132           823           SLLS  R3,2                                               CMT08240
110A  2734           824           SIS   R3,4                R3 = 4(DIGITS)-4               CMT08250
110C  0841           825  HEXASC1  LDAR  R4,R1               R4 = HEX DATA                  CMT08260
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110E   CC43 0000          826           SRAL  R4,0(R3)                                  CMT08270
1112   C440 000F          827           NHI   R4,15             R4 = HEX DIGIT TO BE CONVERTED CMT08280
1116   D344 171C          828           LB    R4,HEXTAB(R4)                               CMT08290
111A   D242 0000          829           STB   R4,0(R2)          STORE ASCII CHAR            CMT08300
111E   2621               830           AIS   R2,1                                        CMT08310
1120   2734               831           SIS   R3,4                                        CMT08320
1122   221B               832           BNMS  HEXASC1           LOOP TILL ALL DIGITS        CMT08330
1124   D100 3F08          833           LM    R0,RSAVE          RESTORE REGISTERS           CMT08340
1128   030F               834           BR    LINK              RETURN                      CMT08350
                          835  *----------------------------                               CMT08360
                          836  *  TO PRINT THE ASCII MESSAGE                               CMT08370
                          837  *                                                           CMT08380
112A   D000 3F08          838  PRINT    STM   R0,RSAVE          STORE REGISTERS             CMT08390
112E   41F0 12DE          839           BAL   LINK,TSTDU                                  CMT08400
1132   2335               840           BZS   P1                                          CMT08410
1134   4010 1704          841           STH   R1,WASDU          SET FLAG                    CMT08420
1138   4300 1198          842           B     PRINT5            EXIT                        CMT08430
113C   4820 1704          843  P1       LH    R2,WASDU                                    CMT08440
1140   4330 116E          844           BZ    P3                                          CMT08450
1144   C810 0140          845           LHI   R1,X'140'         DELAY CONSTANT              CMT08460
1148   C800 1000          846           LHI   R0,X'1000'                                  CMT08470
114C   2701               847           SIS   R0,1                                        CMT08480
114E   2031               848           BTBS  3,1                                         CMT08490
1150   2711               849           SIS   R1,1                                        CMT08500
1152   2035               850           BTBS  3,5               LOOP TILL TIMEOUT           CMT08510
1154   0744               851           XAR   R4,R4                                       CMT08520
1156   4040 1704          852           STH   R4,WASDU                                    CMT08530
115A   2541               853           LCS   R4,1              CHARACTER = X'FF'           CMT08540
115C   4040 1706          854           STH   R4,WASDU1                                   CMT08550
1160   2434               855           LIS   R3,4                                        CMT08560
1162   41F0 11B0          856  P2       BAL   LINK,OUTCHR                                 CMT08570
1166   2731               857           SIS   R3,1                                        CMT08580
1168   2023               858           BPS   P2                                          CMT08590
116A   4300 0F10          859           B     KEEP10            PRINT TOTAL, TOTERR         CMT08600
116E   4800 17F8          860  P3       LH    R0,NOMSG+6                                  CMT08610
1172   2335               861           BZS   PRINT2            NO, PRINT ALL MESSAGES      CMT08620
1174   4800 16FE          862           LH    R0,ISITERR                                  CMT08630
1178   4330 1198          863           BZ    PRINT5            NOT AN ERROR MSG. EXIT      CMT08640
                          864  *                                                           CMT08650
117C   D345 0000          865  PRINT2   LB    R4,0(R5)          GET A MESSAGE BYTE          CMT08660
1180   41F0 11B0          866           BAL   LINK,OUTCHR       OUTPUT IT                   CMT08670
1184   274D               867           SIS   R4,13             CR ?                        CMT08680
1186   2333               868           BZS   PRINT3            MSG OVER                    CMT08690
1188   2651               869           AIS   R5,1                                        CMT08700
118A   2207               870           BS    PRINT2            LOOP FOR NEXT CHAR          CMT08710
118C   244A               871  PRINT3   LIS   R4,10             LF                          CMT08720
118E   41F0 11B0          872           BAL   LINK,OUTCHR       LF                          CMT08760
1192   2541               873           LCS   R4,1              DEL                         CMT08770
1194   41F0 11B0          874  PRINT38  BAL   LINK,OUTCHR       TERMINAL CHARACTER          CMT08800
1198   41F0 126A          875  PRINT5   BAL   LINK,TSTBRK                                 CMT08810
119C   D100 3F08          876           LM    R0,RSAVE          RESTORE REGISTERS           CMT08820
11A0   030F               877           BR    LINK              RETURN                      CMT08830
                          878  *----------------------------------                        CMT08840
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                        879  *  SMALL SUPPORT ROUTINES                                                    CMT08850
                        880  *                                                                           CMT08860
                        881  *  TO OUTPUT CR,LF TO LIST DEVICE                                           CMT08870
                        882  *                                                                           CMT08880
11A2  D000 3F08         883  CRLF     STM   R0,RSAVE            STORE REGISTERS                        CMT08890
11A6  244D              884           LIS   R4,13                                                       CMT08900
11A8  41F0 11B0         885           BAL   LINK,OUTCHR         OUTPUT CR                              CMT08910
11AC  4300 118C         886           B     PRINT3              LINE FEED, RESTORE, RETURN             CMT08920
                        887  *----------------------------                                             CMT08930
                        888  *  TO OUTPUT A CHARACTER TO THE LIST DEVICE                                 CMT08940
11B0  40F0 1218         889  OUTCHR   STH   R15,OUT1+2         SAVE RETURN ADDRESS                    CMT08950
11B4  D300 3E47         890           LB    R0,IOSAVE+1                                                 CMT08960
11B8  2704              891           SIS   R0,4                                                        CMT08970
11BA  4230 11EC         892           BNZ   OUTCHR2             BRANCH IF NOT CAROUSEL                 CMT08980
11BE  4000 121A         893  OTC.     STH   R0,PAUSE                                                   CMT08990
11C2  41F0 12DE         894  OTC.0    BAL   LINK,TSTDU          ON LINE ?                              CMT09000
11C6  4230 1212         895           BNZ   OUT0                NO, BRANCH                             CMT09010
11CA  9D01              896           SSR   R0,R1              GET CAROUSEL STATUS                    CMT09020
11CC  2385              897           BFFS  8,OTC.1             BRANCH IF CHAR. IS TO BE READ          CMT09030
11CE  4810 121A         898           LH    R1,PAUSE            PAUSED NOW ?                           CMT09040
11D2  2038              899           BNZS  OTC.0               YES, LOOP                              CMT09050
11D4  230C              900           BS    OUTCHR2             NO, GO OUTPUT CHARACTER                CMT09060
      0000 11D6         901  OTC.1    EQU   *                                                           CMT09070
11D6  9B01              902           RDR   R0,R1               GET CAROUSEL CHARACTER                 CMT09080
11D8  C410 007F         903           NHI   R1,X'7F'                                                   CMT09090
11DC  CB10 0012         904           SHI   R1,X'12'            DC2 ?                                  CMT09100
11E0  2336              905           BZS   OUTCHR2             YES, BRANCH                            CMT09110
11E2  2712              906           SIS   R1,2                DC4 ?                                  CMT09120
11E4  4330 11BE         907           BZ    OTC.                YES, GO SET PAUSE FLAG                 CMT09130
11E8  4300 11C2         908           B     OTC.0               NO, GO WAIT FOR DC2                    CMT09140
      0000 11EC         909  OUTCHR2  EQU   *                                                           CMT09150
11EC  4010 121A         910           STH   R1,PAUSE            RESET FLAG                             CMT09160
11F0  41F0 12DE         911           BAL   LINK,TSTDU          OFF-LINE ?                             CMT09170
11F4  213F              912           BNZS  OUT0                BRANCH IF OFF-LINE                     CMT09180
11F6  4110 134A         913           BAL   R1,SETUP            SET UP FOR OUTPUT                      CMT09190
11FA  9D01              914  OTC.4    SSR   R0,R1              WAIT FOR NOT BUSY                      CMT09200
11FC  213B              915           BTFS  3,OUT0              BRANCH IF OFF-LINE                     CMT09210
11FE  C510 000C         916           CLHI  R1,12               PASLA OFFLINE ?                        CMT09220
1202  2338              917           BES   OUT0                BRANCH: YES.                           CMT09230
1204  C310 0008         918           THI   R1,8                BUSY ?                                 CMT09240
1208  2037              919           BNZS  OTC.4               WAIT FOR NOT BUSY.                     CMT09250
120A  9A04              920           WDR   R0,R4               OUTPUT DATA BYTE                       CMT09260
120C  9D01              921           SSR   R0,R1                                                       CMT09270
120E  2081              922           BTBS  8,1                 WAIT FOR NOT BUSY.                     CMT09280
1210  2303              923           BS    OUT1                                                        CMT09290
1212  4010 1704         924  OUT0     STH   R1,WASDU            SET FLAG                               CMT09300
1216  4300 1216         925  OUT1     B     *                   RETURN AS SET UP ABOVE                 CMT09310
121A  0000              926  PAUSE    DCX   0                   SET DURING TRANSMISSION PAUSE          CMT09320
                        927  *----------------------------                                             CMT09330
                        928  *  TO GET A CHAR FROM KEYBOARD (IN REG R4)                                 CMT09340
                        929  *                                                                           CMT09350
121C  4140 1312         930  GETCHR   BAL   R4,KBREAD           PUT KB DEVICE IN READ MODE             CMT09360
1220  9D04              931           SSR   R0,R4                                                       CMT09370
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1222  021F           932           BTCR  1,LINK            IF DU, RETURN                    CMT09380
1224  2082           933           BTBS  8,2               IF BUSY, LOOP                    CMT09390
1226  D400 0A1A      934           CLB   R0,MICROBUS       IS IT BICROBUS ?                 CMT09400
122A  2333           935           BES   ECHO1             YES, BRANCH                      CMT09410
122C  9B04           936           RDR   R0,R4             READ A CHAR IN R4                CMT09420
122E  2303           937           BS    ECHO                                               CMT09430
1230  9B04           938 ECHO1     RDR   R0,R4                                              CMT09440
1232  9A04           939           WDR   R0,R4                                              CMT09450
                     940 * TO ECHO RECEIVED CHARACTERS TO CONSOLE DEVICE IN FDX MODE        CMT09460
1234  D390 16DC      941 ECHO      LB    R9,CONRD                                           CMT09470
1238  C590 00A9      942           CLHI  R9,X'A9'          CAROUSEL ?                       CMT09480
123C  2137           943           BNES  ECHRTN            DO NOT ECHO                      CMT09490
123E  D390 16DB      944           LB    R9,CONADR+1                                        CMT09500
1242  DD90 16D3      945           SS    R9,SINK                                            CMT09510
1246  2082           946           BTBS  8,2                                                CMT09520
1248  9A94           947           WDR   R9,R4             ECHO RECEIVED BYTE               CMT09530
124A  C440 007F      948 ECHRTN    NHI   R4,X'7F'          REMOVE PARITY BIT                CMT09540
124E  030F           949           BR    LINK              RETURN                           CMT09550
                     950 *-----------------------------                                    CMT09560
                     951 *  TO OUTPUT '?' TO CONSOLE                                      CMT09570
                     952 *                                                                 CMT09580
1250  41F0 11A2      953 QUESTN    BAL   LINK,CRLF                                         CMT09590
1254  40F0 16FE      954           STH   LINK,ISITERR      SET FLAG                         CMT09600
1258  C850 17B2      955           LHI   R5,QMSG                                          CMT09610
125C  41F0 112A      956           BAL   LINK,PRINT        PRINT '?'                        CMT09620
1260  0700           957           XAR   R0,R0             ---                              CMT09630
1262  4000 16FE      958           STH   R0,ISITERR                                       CMT09640
1266  4300 0AEA      959           B     OPTIN1            TO ACCEPT COMMAND INPUT          CMT09650
                     960 *-----------------------------                                    CMT09660
                     961 * IF BREAK KEY DEPRESSED, GO TO 'OPTIN' OR (BRKVECT); ELSE RETURN. CMT09670
                     962 *                                                                 CMT09680
126A  D000 3F48      963 TSTBRK    STM   R0,RSAVE+64       STORE REGISTERS                  CMT09690
126E  40F0 12DC      964           STH   LINK,BRKRTN                                      CMT09700
1272  D3C0 16DA      965           LB    R0,CONADR         GET KEYBOARD DEVICE ADR          CMT09710
1276  9D01           966           SSR   R0,R1                                            CMT09720
1278  C310 0020      967           THI   R1,X'20'          'BREAK' KEY PRESSED ?            CMT09730
127C  4330 12D0      968           BZ    TSTBRK3           NO. EXIT                         CMT09740
1280  D320 0A10      969           LB    R2,IO                                            CMT09750
1284  C520 0005      970           CLHI  R2,5              IS IT MICROBUS ?                 CMT09760
1288  213D           971           BNES  TSTBRK4           NO, BRANCH                       CMT09770
      0000 128A      972 TSTBRK5   EQU   *                                                CMT09780
128A  9B02           973           RDR   R0,R2                                            CMT09790
128C  9D01           974 TSTBRK5A  SSR   R0,R1                                            CMT09800
128E  C310 0020      975           THI   R1,X'20'                                         CMT09810
1292  4330 12C4      976           BZ    TSTBRK2                                          CMT09820
1296  C810 7FFF      977           LHI   R1,X'7FFF'                                       CMT09830
129A  2711           978           SIS   R1,1                                             CMT09840
129C  2031           979           BTBS  3,1                                              CMT09850
129E  4300 128A      980           B     TSTBRK5                                          CMT09860
      0000 12A2      981 TSTBRK4   EQU   *                                                CMT09870
12A2  4820 16D6      982           LH    R2,PASFLG         PASLA ?                          CMT09880
12A6  233B           983           BZS   TSTBRK1           BRANCH IF NO.                    CMT09890
12A8  C310 0008      984           THI   R1,8              ALREADY ACKNOWLEDGED ?           CMT09900
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12AC 4230 12D0          985          BNZ   TSTBRK3            BRANCH IF YES                          CMT09910
12B0 9B02               986          RDR   R0,R2                                                     CMT09920
12B2 9D01               987          SSR   R0,R1                                                     CMT09930
12B4 2281               988          BFBS  8,1                                                       CMT09940
12B6 0822               989          LDAR  R2,R2              ZERO CHARACTER ?                       CMT09950
12B8 213C               990          BNZS  TSTBRK3            BRANCH: JUST FRAMING ERROR             CMT09960
12BA 2305               991          BS    TSTBRK2                                                   CMT09970
12BC 9D01               992  TSTBRK1 SSR   R0,R1                                                     CMT09980
12BE C310 0020          993          THI   R1,X'20'                                                  CMT09990
12C2 2033               994          BTBS  3,3                WAIT FOR BREAK KEY RELEASE             CMT10000
12C4 48F0 16FC          995  TSTBRK2 LH    R15,BRKVECT        CHECK FOR SPECIAL ROUTINE              CMT10010
12C8 4330 0AE6          996          BZ    OPTIN              BRK W/NO VECTOR: TO EXEC.              CMT10020
12CC 40F0 12DC          997          STH   R15,BRKRTN         SET UP FOR EXIT                        CMT10030
12D0 2400               998  TSTBRK3 LIS   R0,0                                                      CMT10040
12D2 4000 16FC          999          STH   R0,BRKVECT         DELETE VECTOR AFTER ONE SHOT.          CMT10050
12D6 D100 3F48         1000          LM    R0,RSAVE+64        RESTORE REGISTERS                      CMT10060
12DA 4300 12DA         1001          B     *                  RETURN TO PROGRAM                      CMT10070
     0000 12DC         1002  BRKRTN  EQU   *-2                                                      CMT10080
                       1003  *-----------------------------                                         CMT10090
                       1004  * SEE IF LIST DEVICE OFF-LINE (R1, CC NON-ZERO IF OFF)                  CMT10100
                       1005  *                                                                       CMT10110
12DE D310 3E47         1006  TSTDU   LB    R1,IOSAVE+1        GET LIST DEVICE IDENTIFIER             CMT10120
12E2 9111              1007          SLHLS R1,1               (R1) = 2,4,6,8,A                       CMT10130
12E4 D3D1 0A10         1008          LB    R0,IO(R1)          GET LIST DEVICE ADDRESS                CMT10140
12E8 9D01              1009          SSR   R0,R1                                                     CMT10150
12EA 4880 16D8         1010          LH    R8,PASFLG2                                                CMT10160
12EE 2338              1011          BZS   TSTDU1             BRANCH IF LIST DEVICE NOT PASLA        CMT10170
12F0 C410 00FC         1012          NHI   R1,X'FC'                                                  CMT10180
12F4 C510 000C         1013          CLHI  R1,X'0C'           BSY & EX SET ?                         CMT10190
12F8 2133              1014          BNES  TSTDU1             BRANCH IF PASLA ON-LINE                CMT10200
12FA 0811              1015          LDAR  R1,R1                                                     CMT10210
12FC 030F              1016          BR    LINK               PASLA OFF-LINE                         CMT10220
12FE C410 0001         1017  TSTDU1  NHI   R1,1               (R1) = DU BIT                          CMT10230
1302 030F              1018          BR    LINK               RETURN                                 CMT10240
                       1019  * --------------------------------                                      CMT10250
                       1020  * TO DIRECT INPUT AND OUTPUT TO CONSOLE DEVICE                          CMT10260
                       1021  *                                                                       CMT10270
1304 D300 0A10         1022  SETKB   LB    R0,IO              GET KEYBOARD DEVICE                    CMT10280
1308 9410              1023          EXBR  R1,R0                                                     CMT10290
130A 0610              1024          OAR   R1,R0                                                     CMT10300
130C 4010 3E46         1025          STH   R1,IOSAVE          KB DEVICE = LIST DEVICE                CMT10310
1310 030F              1026          BR    LINK               RETURN                                 CMT10320
                       1027  *-----------------------------                                         CMT10330
                       1028  *  TO PUT KEYBOARD DEVICE IN READ MODE                                  CMT10340
                       1029  *                                                                       CMT10350
1312 D300 16DA         1030  KBREAD  LB    R0,CONADR                                                 CMT10360
1316 DE00 16DC         1031          OC    R0,CONRD                                                  CMT10370
131A DB00 16D3         1032          RD    R0,SINK                                                   CMT10380
131E 4890 16D6         1033          LH    R9,PASFLG          PASLA ?                                CMT10390
1322 4200 1322         1034          NOP   *                  FOR SPECIAL KB DEVICE                  CMT10400
1326 0334              1035  TTYGET  BZR   R4                 RETURN                                 CMT10410
1328 DE00 16F4         1036          OC    R0,CONRQ2S                                                CMT10420
132C 0304              1037          BR    R4                 RETURN                                 CMT10430
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                        1038  *------------------------------                                  CMT10440
                        1039  *  TO SET UP KEYBOARD DEV TO READ WITH INT ENABLED              CMT10450
                        1040  *                                                               CMT10460
132E  D000 3F08         1041  KBRD     STM   R0,RSAVE          SAVE REGISTERS               CMT10470
1332  D300 16DA         1042           LB    R0,CONADR         GET KB DEV ADR               CMT10480
1336  4810 16D6         1043           LH    R1,PASFLG         PASLA ?                      CMT10490
133A  2333              1044           BZS   KBRD1                                          CMT10500
133C  DE00 16F4         1045           OC    R0,CONRQ2S                                     CMT10510
1340  DE00 16E9         1046  KBRD1    OC    R0,CONENRD        CONSOLE : ENABLE, READ       CMT10520
1344  D100 3F08         1047           LM    R0,RSAVE          RESTORE REGISTERS            CMT10530
1348  030F              1048           BR    LINK              RETURN                       CMT10540
                        1049  *------------------------------                                  CMT10550
                        1050  *  LIST DEVICE SET UP ROUTINE                                  CMT10560
                        1051  *                                                               CMT10570
134A  4010 135E         1052  SETUP    STH   R1,SET.RTN                                      CMT10580
134E  D310 3E47         1053           LB    R1,IOSAVE+1       GET LIST DEVICE IDENTIFIER   CMT10590
1352  9111              1054           SLHLS R1,1              HW INDEX                     CMT10600
1354  D301 0A11         1055           LB    R0,IO+1(R1)       GET LIST DEVICE ADDRESS      CMT10610
1358  DE01 16DD         1056           OC    R0,CONWRT(R1)                                  CMT10620
135C  4300 135C         1057           B     *                 RETURN                       CMT10630
      0000 135E         1058  SET.RTN  EQU   *-2                                           CMT10640
                        1059  * ***************************                                  CMT10650
                        1060  *  LOW CORE SET UP ROUTINE                                     CMT10660
                        1061  *                                                               CMT10670
1360  0711              1062  LCORE    XAR   R1,R1                                           CMT10680
1362  2422              1063           LIS   R2,2                                            CMT10690
1364  C830 004E         1064           LHI   R3,X'4E'                                        CMT10700
1368  0700              1065           XAR   R0,R0                                           CMT10710
136A  4001 0000         1066  ZERO1    STH   R0,0(R1)                                        CMT10720
136E  C110 136A         1067           BXLE  R1,ZERO1          ZERO CORE FROM 0 THRU X'4F'  CMT10730
1372  C810 0080         1068           LHI   R1,X'80'                                        CMT10740
1376  C830 00CE         1069           LHI   R3,X'CE'                                        CMT10750
137A  4001 0000         1070  ZERO2    STH   R0,0(R1)                                        CMT10760
137E  C110 137A         1071           BXLE  R1,ZERO2          ZERO CORE FROM X'80' THRU X'CF'  CMT10770
1382  C800 14B8         1072           LHI   R0,XI32           INTERRUPT HANDLER ROUTINE    CMT10780
1386  C830 08CE         1073           LHI   R3,X'8CE'                                       CMT10790
138A  4001 0000         1074  ZERO3    STH   R0,0(R1)                                        CMT10800
138E  C110 138A         1075           BXLE  R1,ZERO3          SET UP INT SERVICE POINTER TABLE  CMT10810
1392  C830 15C4         1076           LHI   R3,II                                           CMT10820
1396  4030 0036         1077           STH   R3,X'36'          ILL INST INT NEW PSW LOC     CMT10830
139A  C840 15DE         1078           LHI   R4,MM                                           CMT10840
139E  4040 003E         1079           STH   R4,X'3E'          M. M. INT NEW PSW LOC        CMT10850
13A2  C830 1590         1080           LHI   R3,AF                                           CMT10860
13A6  4030 004E         1081           STH   R3,X'4E'          ARITHMETIC FAULT NEW PSW LOC(32-BIT)  CMT10870
13AA  C830 1578         1082           LHI   R3,FORFAULT       DATA   FORMATFAULT           CMT10880
13AE  4030 00CE         1083           STH   R3,X'CE'                                        CMT10890
                        1084  *                               FIXED PT DIVIDE FAULT NEW PSW LOC  CMT10900
13B2  C840 3F08         1085           LHI   R4,RSAVE                                        CMT10910
13B6                    1086           IFZ   ADC-2                                           CMT10920
13B6  4810 16C4         1087           LH    R1,MOD32                                        CMT10930
13BA  4230 13DC         1088           BNZ   LCORE32                                         CMT10940
                        1089  *                                                               CMT10950
                        1090  *  SET UP LOW CORE FOR 16 BIT MACHINE                          CMT10960
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                        1091  *                                                                      CMT10970
13BE    4040 0022       1092          STH   R4,X'22'          REG SAVE POINTER                     CMT10980
13C2    C830 157E       1093          LHI   R3,FP                                                    CMT10990
13C6    4030 002E       1094          STH   R3,X'2E'          FLOATING PT FAULT INT NEW PSW LOC    CMT11000
13CA    4850 0A24       1095          LH    R5,PSW2                                                  CMT11010
13CE    4050 0044       1096          STH   R5,X'44'          HW EXT INT NEW PSW STATUS            CMT11020
13D2    C850 14AA       1097          LHI   R5,XI16                                                  CMT11030
13D6    4050 0046       1098          STH   R5,X'46'          EXT INT NEW PSW LOC                  CMT11040
13DA    030F            1099          BR    LINK                                                     CMT11050
                        1100          ENDC                                                           CMT11060
                        1101  *                                                                      CMT11070
                        1102  *  SET UP LOW CORE FOR 32 BIT MACHINE                                  CMT11080
                        1103  *                                                                      CMT11090
13DC    4040 0086       1104  LCORE32 STH   R4,X'86'          REG SAVE POINTER                     CMT11100
13E0    C840 3F00       1105          LHI   R4,PSWSAVE        PPF PSW SAVE AREA                    CMT11110
13E4    4040 0084       1106          STH   R4,X'84'          .   POINTER                          CMT11120
13E8    C830 1586       1107          LHI   R3,RP                                                    CMT11130
13EC    4030 0096       1108          STH   R3,X'96'          RELOC/PROTECT INT NEW PSW LOC        CMT11140
13F0    D310 16DA       1109          LB    R1,CONADR         LOAD CONSOLE I/O ADDRESS             CMT11150
13F4    0A11            1110          AAR   R1,R1                                                    CMT11160
13F6    C800 1414       1111          LHI   R0,KBINT0         R0 = A(KEYBOARD INT HANDLER)         CMT11170
13FA    4001 00D0       1112          STH   R0,X'D0'(R1)      STORE @  X'D0'+2(KB DEV ADR)         CMT11180
13FE    0711            1113          XAR   R1,R1             TO SET UP SERVICE POINTER TABLE      CMT11190
1400    C830 14B8       1114          LHI   R3,XI32                                                  CMT11200
1404    4821 1970       1115  LCORE32A LH   R2,DEVSADR(R1)    GET DEV ADR FROM TABLE               CMT11210
1408    021F            1116          BMR   LINK              DONE. RETURN                         CMT11220
140A    0A22            1117          AAR   R2,R2                                                    CMT11230
140C    4032 00D0       1118          STH   R3,X'D0'(R2)      STORE @  X'D0'+2(DEV ADR)            CMT11240
1410    2612            1119          AIS   R1,2                                                     CMT11250
1412    2207            1120          BS    LCORE32A                                                 CMT11260
                        1121  *---------------------------------                                    CMT11270
                        1122  *  KEYBOARD INTERRUPT HANDLER                                          CMT11280
                        1123  *                                                                      CMT11290
1414    C330 0020       1124  KBINT0  THI   R3,X'20'          IS BREAK KEY DEPRESSED ?             CMT11300
1418    4330 145C       1125          BZ    KBINT1            NO                                   CMT11310
141C    D300 0A10       1126          LB    R0,IO                                                    CMT11320
1420    C500 0005       1127          CLHI  R0,5              IS IT MICROPUS ?                     CMT11330
1424    213C            1128          BNES  KBINTOB           NO, BRANCH                           CMT11340
1426    DE20 16E6       1129          OC    R2,MREADC         YES, ISSUE READ                      CMT11350
142A    9D23            1130          SSR   R2,R3                                                    CMT11360
142C    2081            1131          BTBS  8,1                                                      CMT11370
142E    9B24            1132  KBINTOC BDR   R2,R4             KNOCK DOWN BREAK                     CMT11380
1430    9D23            1133          SSR   R2,R3                                                    CMT11390
1432    C330 0020       1134          THI   R3,X'20'          BREAK STILL THERE ?                  CMT11400
1436    2034            1135          BNZS  KBINTOC           YES, KNOCK IT DOWN AGAIN             CMT11410
1438    4300 1498       1136          B     RETOPSW           NO, RETURN ON OLD PSW                CMT11420
        0000 143C       1137  KBINTOB EQU   *                                                      CMT11430
143C    4850 16D6       1138          LH    R5,PASFLG         CONSOLE ON PASLA ?                   CMT11440
1440    2339            1139          BZS   KBINTOA           BRANCH IF NO.                        CMT11450
1442    9B24            1140          BDR   R2,R4                                                    CMT11460
1444    9D23            1141          SSR   R2,R3                                                    CMT11470
1446    2281            1142          BFBS  8,1                                                      CMT11480
1448    0844            1143          LDAR  R4,R4                                                    CMT11490
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144A  4230 1498          1144           BNZ   RETOPSW          IGNORE PREPP ONLY                        CMT11500
144E  4300 1470          1145  KBINT00  B     KBINT3           ***                                      CMT11510
1452  9D23               1146  KBINT0A  SSR   R2,R3                                                     CMT11520
1454  C330 0020          1147           THI   R3,X'20'                                                 CMT11530
1458  2033               1148           BTBS  3,3              WAIT FOR BREAK RELEASE                   CMT11540
145A  2206               1149           BS    KBINT00          GO TO COMMAND MODE                       CMT11550
      0000 145C          1150  KBINT1   EQU   *                                                        CMT11560
145C  C500 0005          1151           CLHI  R0,5             IS IT MICROBUS ?                         CMT11570
1460  2138               1152           BNES  KBINT3           NO, BRANCH                               CMT11580
1462  DE20 16E6          1153           OC    R2,MREADC        READ COMMAND TO MICROBUS                 CMT11590
1466  9D23               1154           SSR   R2,R3                                                     CMT11600
1468  2081               1155           BTBS  8,1                                                      CMT11610
146A  9B24               1156           RDR   R2,R4            KNOCK DOWN INTERRUPT                     CMT11620
146C  4300 1498          1157           B     RETOPSW          RETURN                                   CMT11630
      0000 1470          1158  KBINT3   EQU   *                                                        CMT11640
1470  4020 16D0          1159           STH   R2,INTDEV                                                CMT11650
1474  D230 16D2          1160           STB   R3,INTSTA                                                CMT11660
1478                     1161           IFZ   ADC-2                                                    CMT11670
1478  4840 16C4          1162           LH    R4,MOD32                                                 CMT11680
147C  2335               1163           BZS   KBINT2                                                   CMT11690
                         1164           ENDC                                                           CMT11700
147E  4000 16CA          1165           STH   R0,OPSW          STORE OLD PSW OF 32-BIT PROCESSOR        CMT11710
1482  4010 16CE          1166           STH   R1,OLOC          IN ORDER TO RETURN BACK TO TEST          CMT11720
1486  9B24               1167  KBINT2   RDR   R2,R4                                                    CMT11730
1488  41F0 1234          1168           BAL   LINK,ECHO        ECHO RECEIVED BYTE                       CMT11740
148C  4890 16FA          1169           LH    R9,KBINT         IF ZERO,IGNORE; ELSE                     CMT11750
1490  0239               1170           BNZR  R9               GO,PROCESS KB INT FURTHER                CMT11760
1492  D320 0A10          1171  NOBRK    LB    R2,IO            .                                  **    CMT11770
1496  9B24               1172           RDR   R2,R4            .                                  **    CMT11780
                         1173  * ---------------------------------                                      CMT11790
                         1174  *  TO RETURN ON OLD PSW                                                 CMT11800
                         1175  *                                                                       CMT11810
      0000 1498          1176  RETOPSW  EQU   *                                                        CMT11820
1498                     1177           IFZ   ADC-2                                                    CMT11830
1498  4890 16C4          1178           LH    R9,MOD32                                                 CMT11840
149C  2135               1179           BNZS  RETOPSW1                                                 CMT11850
149E  D100 3E48          1180           LM    R0,INTSAV        RESTORE REGISTERS                        CMT11860
14A2  C200 0040          1181           LPSW  X'40'            RETURN ON OLD PSW AFTER KB INT           CMT11870
                         1182           ENDC                                                           CMT11880
14A6  C200 16C8          1183  RETOPSW1 LPSW  OPSW32                                                   CMT11890
                         1184  * ***********************************************                        CMT11900
                         1185  *  EXTERNAL INTERRUPT HANDLER                                           CMT11910
14AA                     1186           IFZ   ADC-2                                                    CMT11920
14AA  D000 3E48          1187  XI16     STM   R0,INTSAV        FOR 16-BIT PROCESSOR                     CMT11930
14AE  9F23               1188           ACKR  R2,R3            ACKNOWLEDGE THE INTERRUPT                CMT11940
14B0  D420 16DA          1189           CLB   R2,CONADR        FROM KEYBOARD DEVICE ?                   CMT11950
14B4  4330 1414          1190           BE    KBINT0                                                   CMT11960
                         1191           ENDC                                                           CMT11970
                         1192  *                                                                       CMT11980
      0000 14B8          1193  XI32     EQU   *                FOR 32-BIT PROCESSOR                     CMT11990
14B8  95AA               1194           EPSR  R10,R10          CAPTURE CURRENT PSW                      CMT12000
14BA  40A0 16C6          1195           STH   R10,INTPSW                                               CMT12010
14BE  4020 16D0          1196           STH   R2,INTDEV        STORE INTERRUPTING DEVICE ADDRESS        CMT12020
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14C2  D230 16D2          1197           STB   R3,INTSTA          STORE INTERRUPTING DEVICE STATUS      CMT12030
14C6                     1198           IFZ   ADC-2                                                  CMT12040
14C6  4850 16C4          1199           LH    R5,MOD32                                               CMT12050
14CA  2135               1200           BNZS  XI32A                                                  CMT12060
14CC  4800 0040          1201           LH    R0,X'40'           16-BIT OLD PSW                      CMT12070
14D0  4810 0042          1202           LH    R1,X'42'                                               CMT12080
                         1203           ENDC                                                         CMT12090
14D4  4000 16CA          1204  XI32A    STH   R0,OPSW            STORE OLD PSW STATUS                CMT12100
14D8  4010 16CE          1205           STH   R1,OLOC            STORE OLD PSW LOC                   CMT12110
14DC                     1206           IFZ   ADC-2                                                  CMT12120
14DC  0855               1207           LDAR  R5,R5              MOD32 = 0 ?                         CMT12130
14DE  233A               1208           BZS   XI16A              BRANCH IF YES.                      CMT12140
                         1209           ENDC                                                         CMT12150
14E0  4820 0A24          1210           LH    R2,PSW2                                                CMT12160
14E4  9512               1211           EPSR  R1,R2              SELECT USER REGISTER SET            CMT12170
14E6  D000 3E48          1212           STM   R0,INTSAV          SAVE USER REGISTERS                 CMT12180
14EA  4820 16D0          1213           LH    R2,INTDEV                                              CMT12190
14EE  48A0 16C6          1214           LH    R10,INTPSW                                             CMT12200
                         1215  *                                                                      CMT12210
14F2  0755               1216  XI16A    XAR   R5,R5                                                  CMT12220
14F4  4865 1970          1217  XI1      LH    R6,DEVSADR(R5)     GET DEV ADRS FROM TABLE             CMT12230
14F8  4210 1544          1218           BM    XIERR              TABLE OVERFLOW.                     CMT12240
14FC  0562               1219           CLAR  R6,R2              COMPARE INTERRUPTING DEVICE ADDRESS CMT12250
14FE  2333               1220           BES   XI2                                                    CMT12260
1500  2652               1221           AIS   R5,2                                                   CMT12270
1502  2207               1222           BS    XI1                                                    CMT12280
1504  4865 196A          1223  XI2      LH    R6,DEVINT(R5)      GET INTERRUPT HANDLER ADDRESS       CMT12290
1508  4330 1544          1224           BZ    XIERR              INTERRUPT NOT EXPECTED              CMT12300
150C  4060 1542          1225           STH   R6,XIEXIT                                              CMT12310
                         1226  *                                                                      CMT12320
1510                     1227           IFZ   ADC-2                                                  CMT12330
1510  4860 16C4          1228           LH    R6,MOD32           32-BIT MACHINE ?                    CMT12340
1514  2339               1229           BZS   XI3                BRANCH IF NO.                       CMT12350
                         1230           ENDC                                                         CMT12360
1516  9051               1231           SRLS  R5,1                                                   CMT12370
1518  90A4               1232           SRLS  R10,4                                                  CMT12380
151A  C4A0 000F          1233           NHI   R10,15                                                 CMT12390
151E  D4A5 1966          1234           CLB   R10,INTLVL(R5)     CHECK PROPER INTERRUPT LEVEL        CMT12400
1522  4230 1554          1235           BNE   LVLERR                                                 CMT12410
                         1236  *                                                                      CMT12420
1526  4860 16CE          1237  XI3      LH    R6,OLOC            GET PSW AT TIME OF INTERRUPT        CMT12430
152A  C560 10C4          1238           CLHI  R6,TIMER+4                                             CMT12440
152E  2187               1239           BLS   XI4                WAS INTERRUPT IN TIMER ROUTINE ?    CMT12450
1530  C560 10D8          1240           CLHI  R6,TIMXT                                               CMT12460
1534  2384               1241           BNLS  XI4                BRANCH IF NO.                       CMT12470
1536  D100 3F08          1242           LM    R0,RSAVE           RESTORE FROM 'TIMER' ENTRY          CMT12480
153A  2303               1243           BS    XI5                                                    CMT12490
153C  D100 3E48          1244  XI4      LM    R0,INTSAV          RESTORE FROM XI16/XI32 ENTRY        CMT12500
1540  4300 1540          1245  XI5      B     *                  AND GO TO INTERRUPT HANDLER         CMT12510
      0000 1542          1246  XIEXIT   EQU   *-2                                                   CMT12520
                         1247  *-----------------------------------                                 CMT12530
                         1248  *  EXTERNAL INTERRUPT ERROR ROUTINE                                  CMT12540
                         1249  *                                                                      CMT12550
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EXEC - ETPE R03P2 (W/CONDITIONAL ASSEMBLY)

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1544  C860 4634          1250  XIERR    LHI   R6,C'F4'          ERROR # F4                                  CMT12560
1548  4060 173E          1251           STH   R6,ERRNO                                                        CMT12570
154C  41F0 0F9A          1252           BAL   LINK,ERRALL       'ERROR XXF4', 'DEV DDD STA SS'              CMT12580
                         1253  *                                'PSW PPPP  LOC LLLL'                        CMT12590
1550  4300 0AEA          1254           B     OPTIN1            TO ENTER COMMAND MODE                       CMT12600
                         1255  *-------------------------------                                             CMT12610
                         1256  * DEVICE INTERRUPTED IN WRONG INTERRUPT LEVEL                                 CMT12620
                         1257  *                                                                             CMT12630
1554  C860 4636          1258  LVLERR   LHI   R6,C'F6'          ERROR # F6                                  CMT12640
1558  4060 173E          1259           STH   R6,ERRNO                                                        CMT12650
155C  D3AA 171C          1260           LB    R10,HEXTAB(R10)   CONVERT TO ASCII                            CMT12660
1560  D2A0 17A0          1261           STB   R10,ERRLVL        AND STORE ERROR LEVEL IN MESSAGE            CMT12670
1564  41F0 0F9A          1262           BAL   LINK,ERRALL       'ERROR XXF6', 'DEV DDD STA SS'              CMT12680
                         1263  *                                'PSW PPPP  LOC LLLL'                        CMT12690
1568  C850 178A          1264           LHI   R5,INTLVLM                                                      CMT12700
156C  4050 16FE          1265           STH   R5,ISITERR        SET FLAG TO OVERRIDE NOMSG OPTION           CMT12710
1570  41F0 112A          1266           BAL   LINK,PRINT        'INTERRUPTED IN LEVEL  N'                   CMT12720
1574  4300 0AEA          1267           B     OPTIN1            ENTER COMMAND MODE.                         CMT12730
                         1268  *-------------------------------                                             CMT12740
                         1269  *  SPURIOUS INTERRUPT HANDLERS                                               CMT12750
                         1270  *                                                                             CMT12760
                         1271  *                                                                             CMT12770
1578  C820 4637          1272  FORFAULT LHI   R2,C'F7'                                                       CMT12780
157C  2307               1273           BS    RP+4                                                          CMT12790
157E                     1274           IFZ   ADC-2                                                         CMT12800
                         1275  *  FLOATING-PT ARITH FAULT INT TRAP  (16 BIT PROCESSOR)                       CMT12810
                         1276  *                                                                             CMT12820
157E  48E0 0028          1277  FP       LH    R14,X'28'         OLD PSW (16-BIT PROCESSOR)                  CMT12830
1582  48F0 002A          1278           LH    R15,X'2A'         OLD LOC                                     CMT12840
                         1279           ENDC                                                                CMT12850
                         1280  *                                                                             CMT12860
                         1281  *  RELOCATION/PROTECTION INT TRAP                                             CMT12870
                         1282  *                                                                             CMT12880
1586  C820 4635          1283  RP       LHI   R2,C'F5'                                                       CMT12890
158A  4020 173E          1284           STH   R2,ERRNO          SET ERROR # F5                              CMT12900
158E  230C               1285           BS    COMM                                                          CMT12910
                         1286  *                                                                             CMT12920
                         1287  *  ARITHMETIC FAULT INT (32-BIT PROCESSOR) TRAP                               CMT12930
1590                     1288           IFZ   ADC-2                                                         CMT12940
                         1289  *  FIXED-PT DIVIDE FAULT INT (16-BIT PROCESSOR) TRAP                          CMT12950
                         1290           ENDC                                                                CMT12960
                         1291  *                                                                             CMT12970
1590  C820 4631          1292  AF       LHI   R2,C'F1'                                                       CMT12980
1594  4020 173E          1293           STH   R2,ERRNO          SET ERROR # F1                              CMT12990
1598                     1294           IFZ   ADC-2                                                         CMT13000
1598  4820 16C4          1295           LH    R2,MOD32                                                      CMT13010
159C  2135               1296           BNZS  COMM                                                          CMT13020
159E  48E0 0048          1297           LH    R14,X'48'         OLD PSW (16-BIT PROCESSOR)                  CMT13030
15A2  48F0 004A          1298           LH    R15,X'4A'         OLD LOC (16-BIT PROCESSOR)                  CMT13040
                         1299           ENDC                                                                CMT13050
15A6  40E0 16CA          1300  COMM     STH   R14,OPSW                                                       CMT13060
15AA  40F0 16CE          1301           STH   R15,OLOC                                                      CMT13070
15AE  4800 0A24          1302  COMM1    LH    R0,PSW2                                                       CMT13080
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15B2  9520            1303          EPSR  R2,R0              NO INT. , REG SET 15          CMT13090
15B4  41F0 0F4C       1304          BAL   LINK,ERP            PRINT 'ERROR XXFN'            CMT13100
15B8  40F0 16FE       1305          STH   LINK,ISITERR        FORCE PRINT                   CMT13110
15BC  41E0 1044       1306          BAL   RET,ERRPL1          PRINT 'PSW PPPP  LOC LLLL'    CMT13120
15C0  4300 0AEA       1307          B     OPTN1               ENTER COMMAND MODE            CMT13130
                      1308  *                                                               CMT13140
                      1309  *  ILLEGAL INSTRUCTION INTERRUPT TRAP                           CMT13150
                      1310  *                                                               CMT13160
15C4  C820 4632       1311  II      LHI   R2,C'F2'                                        CMT13170
15C8  4020 173E       1312          STH   R2,ERRNO            SET ERROR # F2                CMT13180
15CC                  1313          IFZ   ADC-2                                           CMT13190
15CC  4820 16C4       1314          LH    R2,MOD32                                        CMT13200
15D0  2135            1315          BNZS  II32                                            CMT13210
15D2  48E0 0030       1316          LH    R14,X'30'           OLD PSW                     CMT13220
15D6  48F0 0032       1317          LH    R15,X'32'           OLD LOC                     CMT13230
                      1318          ENDC                                                  CMT13240
15DA  4300 15A6       1319  II32    B     COMM                                            CMT13250
                      1320  *                                                               CMT13260
                      1321  *  MACHINE MALFUNCTION INTERRUPT TRAP                           CMT13270
                      1322  *                                                               CMT13280
15DE  95AA            1323  MM      EPSR  R10,R10             CAPTURE MMINT PSW             CMT13290
15E0  C820 4633       1324          LHI   R2,C'F3'                                        CMT13300
15E4  4020 173E       1325          STH   R2,ERRNO            SET ERROR # F3                CMT13310
15E8  48F0 0022       1326          LH    R14,X'22'           OLD PSW ( 32-BIT PROCESSOR)   CMT13320
15EC  48F0 0026       1327          LH    R15,X'26'           OLD LOC                     CMT13330
15F0                  1328          IFZ   ADC-2                                           CMT13340
15F0  4820 16C4       1329          LH    R2,MOD32                                        CMT13350
15F4  2135            1330          BNZS  MM32                                            CMT13360
15F6  48E0 0038       1331          LH    R14,X'38'           OLD PSW (16 BIT PROCESSOR)  CMT13370
15FA  48F0 003A       1332          LH    R15,X'3A'           OLD LOC                     CMT13380
                      1333          ENDC                                                  CMT13390
15FE  C4E0 FFF0       1334  MM32    NHI   R14,X'FFF0'                                     CMT13400
1602  C4A0 000F       1335          NHI   R10,X'000F'                                     CMT13410
1606  06EA            1336          OAR   R14,R10                                         CMT13420
1608  40E0 16CA       1337          STH   R14,OPSW                                        CMT13430
160C  40F0 16CE       1338          STH   R15,OLOC                                        CMT13440
1610                  1339          IFZ   ADC-2                                           CMT13450
1610  C810 7FFF       1340          LHI   R1,X'7FFF'                                      CMT13460
1614  2711            1341  MM16    SIS   R1,1                                            CMT13470
1616  2021            1342          BPS   MM16                                            CMT13480
                      1343          ENDC                                                  CMT13490
1618  C800 080F       1344          LHI   R0,X'080F'                                      CMT13500
161C  9104            1345          SLHLS R0,4                RO = X'80F0'                CMT13510
161E  9520            1346          EPSR  R2,R0               HALT PROCESSOR              CMT13520
                      1347  *                                                               CMT13724
                      1348  *   WHEN EXE/RUN IS DEPRESSED, ERROR MSG IS PRINTED.          CMT13726
                      1349  *                                                               CMT13728
1620  D320 0A10       1350  MMCOM1  LB    R2,IO               GET INPUT DEVICE POINTER    CMT13530
1624  2725            1351          SIS   R2,5                IS IT MICRO I/O BUS         CMT13540
1626  2334            1352          BZS   MMCOM1A             YES, BRANCH                 CMT13550
1628  4820 16D6       1353          LH    R2,PASFLG           IS CONSOLE ON PASLA         CMT13560
162C  233B            1354          BZS   MMCOM2             NO,BRANCH                   CMT13570
162E  D320 16DB       1355  MMCOM1A LB    R2,CONADR+1         GET CONSOLE TRANMIT'R ADRS  CMT13580
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1632 DE20 16E8  1356          OC    R2,CON2ND       ISSUE 2ND/RESET COMMAND                  CMT13590
1636 D320 16DA  1357          LB    R2,CONADR       GET RECEIVER ADRRESS                     CMT13600
163A DE20 16DC  1358          OC    R2,CONRD        OUTPUT READ CMD                          CMT13610
163E DB20 16D3  1359          RD    R2,SINK         DUMMY READ TO SET BRUSY                  CMT13620
                1360  *                                                                      CMT13630
1642 D320 0A11  1361  MMCOM2  LB    R2,IO+1         GET LIST DEVICE POINTER                  CMT13640
1646 2725       1362          SIS   R2,5            IS IT ON MICRO I/O BUS                   CMT13650
1648 2334       1363          BZS   MMCOM2A         YES, BRANCH                              CMT13660
164A 4820 16D8  1364          LH    R2,PASFLG2      IS LIST DEVICE ON PASLA                  CMT13670
164E 233E       1365          BZS   MMCOM3          NO, BRANCH                               CMT13680
1650 D310 0A11  1366  MMCOM2A LB    R1,IO+1         YES,GET LIST DEVICE POINTER              CMT13690
1654 D320 0A10  1367          LB    R2,IO                                                    CMT13700
1658 0521       1368          CLAR  R2,R1           CONSOLE = LIST DEVICE                    CMT13710
165A 2338       1369          BES   MMCOM3          YES, BRANCH                              CMT13720
165C 9111       1370          SLHLS R1,1                                                     CMT13730
165E D321 0A11  1371          LB    R2,IO+1(R1)     GET LIST DEVICE TRANSMIT ADDRESS         CMT13740
1662 DE21 16E8  1372          OC    R2,CON2ND(R1)   ISSUE 2ND/RESET CMD                      CMT13750
1666 DE21 16DD  1373          OC    R2,CONWRT(R1)   ISSUE LIST WRITE CMD                     CMT13760
                1374  *                                                                      CMT13770
166A 4300 15AE  1375  MMCOM3  B     COMM1                                                    CMT13800
                1376  *                                                                      CMT13810
                1377  *-------------------------                                           CMT13820
166E 48F0 16C4  1378  MACHNUM LH    R15,MOD32       .                                 **     CMT13830
1672 4230 1694  1379          BNZ   BUFCHA32        .                                 **     CMT13840
1676 0777       1380  BUFCHA16 XHR  R7,R7           STORE ADDRESS OF WBUFF OR RBUFF   **     CMT13850
1678 D271 000B  1381          STB   R7,11(R1)       IN OPTION/COMMAND TABLE           **     CMT13860
167C 4061 0006  1382          STH   R6,6(R1)        .                                 **     CMT13870
1680 C510 17CE  1383          CLHI  R1,MWRITE       TEST IF WSTART OR RSTART          **     CMT13880
1684 2334       1384          BES   WSTORE          .                                 **     CMT13890
1686 4060 3630  1385  RSTORE  STH   R6,RADDRS        .                                 **     CMT13900
168A 2303       1386          BS    ROPTIN2         .                                 **     CMT13910
168C 4060 362C  1387  WSTORE  STH   R6,WADDRS        .                                 **     CMT13920
1690 4300 0AE6  1388  ROPTIN2 B     OPTIN           .                                 **     CMT13930
1694 0876       1389  BUFCHA32 LHR  R7,R6           STORES NEW ADRS FOR 32 BIT MACHIN**      CMT13940
1696 4071 0006  1390          STH   R7,6(R1)        STORE 1ST 16 BITS OF NEW ADDRESS  **     CMT13950
169A 1068       1391          DC    X'1068'         NOTE: THESE ARE SRLS INSTRUCTIONS**      CMT13960
169C 1068       1392          DC    X'1068'         THEY PERFORM FULLWORD SHIFTS      **     CMT13970
169E C460 000F  1393          NHI   R6,X'F'         .                                 **     CMT13980
16A2 D261 000B  1394          STB   R6,11(R1)       STORE 1ST 4 BITS OF NEW ADDRESS   **     CMT13990
16A6 C510 17CE  1395          CLHI  R1,MWRITE       .                                 **     CMT14000
16AA 2336       1396          BES   WSTORE1         .                                 **     CMT14010
16AC 4070 3632  1397  RSTORE1 STH   R7,RADDRS+2      STORE RBUFF ADDRESS IN RADDRS     **     CMT14020
16B0 D260 3631  1398          STB   R6,RADDRS+1       .                               **     CMT14030
16B4 2305       1399          BS    ROPTIN1         .                                 **     CMT14040
16B6 4070 362E  1400  WSTORE1 STH   R7,WADDRS+2      STORE WBUFF ADDRESS IN WADDRS     **     CMT14050
16BA D260 362D  1401          STB   R6,WADDRS+1       .                               **     CMT14060
16BE 4300 0AE6  1402  ROPTIN1 B     OPTIN           .                                 **     CMT14070
                1403  * ****************************                                       CMT14080
                1404  *  ETPE CONSTANTS & TABLES                                          CMT14090
                1405  *                                                                    CMT14100
16C2 0000       1406  FIRST   DCX   0                                                     CMT14110
16C4 0000       1407  MOD32   DCX   0               FLAG FOR 32-BIT M/C(NON-ZERO)        CMT14120
16C6 0000       1408  INTPSW  DCX   0               (FOR 32-BIT M/C ONLY)                CMT14130
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16C8                        1409          ALIGN 8                                                  CMT14140
                            1410  *-------------------------                                       CMT14150
16C8  0000                  1411  OPSW32  DCX   0              OLD PSW STORAGE AREA                CMT14160
16CA  0000                  1412  OPSW    DCX   0                                                  CMT14170
16CC  0000                  1413          DCX   0                                                  CMT14180
16CE  0000                  1414  OLOC    DCX   0                                                  CMT14190
                            1415  *-------------------------                                       CMT14200
16D0  0000                  1416  INTDEV  DCX   0              INTERRUPTING DEV ADR                CMT14210
      0000 16D0             1417  ERRDEV  EQU   INTDEV         ERROR DEVICE #                      CMT14220
16D2  00                    1418  INTSTA  DB    0              INTERRUPTING DEV STATUS             CMT14230
      0000 16D2             1419  ERRSTA  EQU   INTSTA         ERRONEOUS STATUS                    CMT14240
16D3  00                    1420  SINK    DB    0              BIT BUCKET                          CMT14250
16D4  80                    1421  NORM    DB    X'80'                                              CMT14260
16D5  40                    1422  INCR    DB    X'40'                                              CMT14270
16D6                        1423          DB    *                                                  CMT14280
16D6  0000                  1424  PASFLG  DCX   0              SET WHEN CONSOLE ON PASLA/PALM      CMT14290
16D8  0000                  1425  PASFLG2 DCX   0              SET WHEN LIST DEVICE ON PASLA       CMT14300
                            1426  * --------------------                                           CMT14310
                            1427  *  ETPE IO COMMANDS                                              CMT14320
                            1428  *                                                                CMT14330
16DA  0000                  1429  CONADR  DCX   0              CONSOLE DEVICE ADDRESS              CMT14340
                            1430  *                                                                CMT14350
16DC  0000                  1431  CONRD   DCX   0              CONSOLE READ/WRITE COMMANDS         CMT14360
      0000 16DD             1432  CONWRT  EQU   CONRD+1                                            CMT14370
16DE  A1A3                  1433  CRTRD   DCX   A1A3           FOR CRT                             CMT14380
16E0  A4D8                  1434  CLIFRD  DCX   A4D8           *   CURRENT LOOP INTERFACE          CMT14390
16E2  0080                  1435  LPWRT   DCX   0080           *   LINE PRINTER                    CMT14400
16E4  A1A3                  1436  CARRD   DCX   A1A3           *   CAROUSEL 300                    CMT14410
16E6  8202                  1437  MREADC  DCX   8202           *   MICROBUS                        CMT14420
                            1438  *                                                                CMT14430
16E8  0000                  1439  CON2ND  DCX   0              2ND COMMAND; ENABLE READ COMMAND    CMT14440
      0000 16E9             1440  CONENRD EQU   CON2ND+1                                           CMT14450
16EA  EE71                  1441  CRT2ND  DCX   EE71           FOR CRT                             CMT14460
16EC  0064                  1442  CLIF2ND DCX   0064           *   CURRENT LOOP INTERFACE          CMT14470
16EE  0000                  1443          DCX   0              *   DUMMY HW FOR LP                 CMT14480
16F0  F069                  1444  CAR2ND  DCX   F069           *   CAROUSEL 300                    CMT14490
16F2  0000                  1445          DCX   0              *   DUMMY HW FOR MICROBUS           CMT14500
                            1446  *                                                                CMT14510
16F4  00                    1447  CONRQ2S DB    0              CONSOLE REQUEST TO SEND CMD         CMT14520
16F5  33                    1448  CRTRQ2S DB    X'33'          FOR CRT                             CMT14530
16F6  00                    1449          DB    0              *   DUMMY BYTE FOR CLI              CMT14540
16F7  00                    1450          DB    0              *   DUMMY BYTE FOR LP               CMT14550
16F8  23                    1451  CARRQ2S DB    X'23'          *   CAROUSEL 300                    CMT14560
16F9  00                    1452          DB    0              *   DUMMY BYTE FOR MICROBUS         CMT14570
16FA                        1453          DB    *                                                  CMT14580
                            1454  * --------------------                                           CMT14590
16FA  1498                  1455  KBINT   DC    Z(RETOPSW)     KEYBOARD INT RETURN ADR             CMT14600
16FC  0000                  1456  BRKVECT DC    Z(0)           BREAK KEY VECTOR                    CMT14610
16FE  0000                  1457  ISITERR DCX   0                                                  CMT14620
1700  0000                  1458  NOERR   DCX   0                                                  CMT14630
1702  0000                  1459  SELTST  DCX   0              HIGHEST SELECTED TEST #             CMT14640
1704  0000                  1460  WASDU   DCX   0              1 IF KEYBOARD DEVICE WAS OFF        CMT14650
1706  0000                  1461  WASDU1  DCX   0              NON-ZERO IF TOTAL,TOTERR TO PRINT   CMT14660
```

```
1708  0000                  1462  TOTAL    DCX   0                    # OF TIMES THE SELECTED TESTS RUN      CMT14670
170A  0000                  1463  TOTERR   DCX   0                    TOTAL ERRORS DETECTED WHILE DU        CMT14680
170C  0000                  1464  BTESTNO  DCX   0                    CURRENT TEST # IN BINARY              CMT14690
170E  0000                  1465  COUNT    DCX   0                                                          CMT14700
1710  0000                  1466  NEXTST   DCX   0                    NEXT TEST #                           CMT14710
                            1467  *                                                                        CMT14720
1712  0001                  1468  DECTAB   DC    1,10,100,1000,10000                                        CMT14730
1714  000A
1716  0064
1718  03E8
171A  2710
171C  3031 3233 3435 3637   1469  HEXTAB   DB    C'0123456789ABCDEF'                                        CMT14740
1724  3839 4142 4344 4546
                            1470  *--------------------------------                                        CMT14750
                            1471  *  ETPE MESSAGES                                                         CMT14760
                            1472  *                                                                        CMT14770
172C  5445 5354 2020 2A2A   1473  TSTMSG   DC    C'TEST  **',X'0D00'                                        CMT14780
1734  0D00
      0000 1732             1474  MTESTNO  EQU   *-4                                                       CMT14790
1736  4552 524F 5220 2A2A   1475  ERRMSG   DC    C'ERROR ****',X'0D00'                                      CMT14800
173E  2A2A
1740  0D00
      0000 173C             1476  ETESTNO  EQU   *-6                  STORED BY ETPE                       CMT14810
      0000 173E             1477  ERRNO    EQU   *-4                  STORE ERRNO AS CHAR CONSTANT         CMT14820
1742  544F 5441 4C20 2020   1478  TOTMSG   DC    C'TOTAL   TOTERR',X'0D00'                                  CMT14830
174A  544F 5445 5252
1750  0D00
1752  4E4F 2045 5252 4F52   1479  NOERMSG  DC    C'NO ERROR',X'0D00'                                        CMT14840
175A  0D00
175C  4445 5620 2A2A 2A20   1480  DEVMSG   DC    C'DEV *** STA **',X'0D00'                                  CMT14850
1764  5354 4120 2A2A
176A  0D00
      0000 1760             1481  ASCIDEV  EQU   *-12                                                      CMT14860
      0000 1764             1482  STAMSG   EQU   *-8                                                       CMT14870
      0000 1768             1483  ASCISTA  EQU   *-4                                                       CMT14880
176C  4445 5620 2A2A 2A20   1484  DEVMSG2  DC    C'DEV ***',X'0D00'                                         CMT14890
1774  0D00
      0000 1770             1485  ASCIDEV2 EQU   *-6                                                       CMT14900
1776  5053 5720 2A2A 2A2A   1486  PSWMSG   DC    C'PSW ****  LOC ****',X'0D00'                             CMT14910
177E  2020 4C4F 4320 2A2A
1786  2A2A
1788  0D00
      0000 177A             1487  ASCIPSW  EQU   *-16                                                      CMT14920
      0000 1780             1488  LOCMSG   EQU   *-10                                                      CMT14930
      0000 1784             1489  ASCILOC  EQU   *-6                                                       CMT14940
178A  494E 5445 5252 5550   1490  INTLVLM  DC    C'INTERRUPTED IN LEVEL  *',X'0D00'                         CMT14950
1792  5445 4420 494E 204C
179A  4556 454C 2020 2A20
17A2  0D00
      0000 17A0             1491  ERRLVL   EQU   *-4                                                       CMT14960
17A4  454E 4420 4F46 2054   1492  EOTMSG   DC    C'END OF TEST',X'0D00'                                     CMT14970
17AC  4553 5420
17B0  0D00
```

```
17B2   3F0D              1493  QMSG     DC    X'3F0D'                          CMT14980
17B4   2A0D              1494  AMSG     DC    X'2A0D'                          CMT14990
```

```
                                1496  *-----------------------------                                    CMT15010
                                1497  *  OPTION/COMMAND TABLE                                          CMT15020
                                1498  *                                                                CMT15030
     0000 17B6                  1499  OPT       EQU   *                                                 CMT15040
17B6 5445 5354 2020             1500  TEST      DC    C'TEST  ',X'FC00',X'0000',X'0000'                 CMT15050
17BC FC00
17BE 0000
17C0 0000
17C2 5253 5441 5254             1501  MREAD     DC    C'RSTART',0,MACHNUM,0                           CMT15060
17C8 0000
17CA 166E
17CC 0000
17CE 5753 5441 5254             1502  MWRITE    DC    C'WSTART',0,MACHNUM,0                           CMT15070
17D4 0000
17D6 166E
17D8 0000
17DA 4C4F 4F50 2020             1503  LOOP      DC    C'LOOP  ',X'0000',X'0000',X'0000'               CMT15080
17E0 0000
17E2 0000
17E4 0000
17E6 434F 4E54 494E             1504  CONTIN    DC    C'CONTIN',X'0000',Z(ZERONE),X'0000'             CMT15090
17EC 0000
17EE 340A
17F0 0000
17F2 4E4F 4D53 4720             1505  NOMSG     DC    C'NOMSG ',X'0000',Z(ZERONE),X'0000'             CMT15100
17F8 0000
17FA 340A
17FC 0000
17FE 4445 5641 4452             1506  DEVADR    DC    C'DEVADR',X'0085',DEVCHN,0                      CMT15110
1804 0085
1806 3440
1808 0000
180A 4456 3241 4452             1507  DV2ADR    DC    C'DV2ADR',0,DEVCHN,0                            CMT15120
1810 0000
1812 3440
1814 0000
1816 5345 4C43 4820             1508  SELADR    DC    C'SELCH ',X'00F0',0,0                           CMT15130
181C 00F0
181E 0000
1820 0000
1822 494E 544C 4556             1509  INTLEV    DC    C'INTLEV',X'0000',Z(LEVEL),X'0000'              CMT15140
1828 0000
182A 3450
182C 0000
182E 4445 5649 4345             1510  DEVICE    DC    C'DEVICE',0,Z(ZERONE),0                         CMT15150
1834 0000
1836 340A
1838 0000
183A 4D4F 4445 2020             1511  MODE      DC    C'MODE  ',2,MODES,0                             CMT15160
1840 0002
1842 3420
1844 0000
1846 5452 4143 4B20             1512  TRACK     DC    C'TRACK ',X'0009',TRACKS,0                      CMT15170
```

```
184C   0009
184E   3412
1850   0000
1852   5245 4346 494C       1513  RECFIL   DC    C'RECFIL',X'0100',X3FF,0                  CMT15180
1858   0100
185A   3438
185C   0000
185E   4259 5445 5320       1514  NOBYTE   DC    C'BYTES ',X'FF',MIN2,0                    CMT15190
1864   00FF
1866   3430
1868   0000
186A   4649 4C45 5320       1515  FILES    DC    C'FILES ',1,X3FF,0                        CMT15200
1870   0001
1872   3438
1874   0000
1876   5245 5045 4154       1516  REPEAT   DC    C'REPEAT',X'0003',X256,0                  CMT15210
187C   0003
187E   3428
1880   0000
1882   4952 4720 2020       1517  IRGDAT   DC    C'IRG   ',X'0010',X256,0                  CMT15220
1888   0010
188A   3428
188C   0000
188E   4455 2020 2020       1518  DUINT    DC    C'DU    ',0,Z(ZERONE),0                   CMT15230
1894   0000
1896   340A
1898   0000
189A   5245 4144 2020       1519  CPRD     DC    C'READ  ',1,Z(ZERONE),0                   CMT15240
18A0   0001
18A2   340A
18A4   0000
18A6   5752 4954 4520       1520  OPWRT    DC    C'WRITE ',1,Z(ZERONE),0                   CMT15250
18AC   0001
18AE   340A
18B0   0000
18B2   424B 5350 4143       1521  OPBSP    DC    C'BKSPAC',1,Z(ZERONE),0                   CMT15260
18B8   0001
18BA   340A
18BC   0000
18BE   534B 4950 2020       1522  OPSKIP   DC    C'SKIP  ',1,Z(ZERONE),0                   CMT15270
18C4   0001
18C6   340A
18C8   0000
18CA   5745 4F46 2020       1523  OPWEOF   DC    C'WEOF  ',0,Z(ZERONE),0                   CMT15280
18D0   0000
18D2   340A
18D4   0000
18D6   434F 4D50 4152       1524  CMPRE    DC    C'COMPAR',1,Z(ZERONE),0                   CMT15290
18DC   0001
18DE   340A
18E0   0000
18E2   4352 4320 2020       1525  SCRC     DC    C'CRC   ',0,Z(ZERONE),0                   CMT15300
18E8   0000
```

EXEC - ETPE R03P2 (W/CONDITIONAL ASSEMBLY)

```
18EA   340A
18EC   0000
18EE   5244 4352 4320      1526  RDCRC    DC    C'RDCRC ',0,Z(ZERONE),0                    CMT15310
18F4   0000
18F6   340A
18F8   0000
18FA   4455 4D50 2020      1527  SDUMP    DC    C'DUMP  ',0,Z(ZERONE),0                    CMT15320
1900   0000
1902   340A
1904   0000
1906   4441 5441 2020      1528  DATA     DC    C'DATA  ',1,Z(ZERONE),0                    CMT15330
190C   0001
190E   340A
1910   0000
1912   5343 4F50 4520      1529  SCOPE    DC    C'SCOPE ',0,SCOP,0                         CMT15340
1918   0000
191A   3448
191C   0000
191E   5449 4D56 414C      1530  TIMVAL   DC    C'TIMVAL',X'140',0,0                       CMT15350
1924   0140
1926   0000
1928   0000
       0000 192A           1531  OPTEND2  EQU   *                                          CMT15370
       0000 192A           1532  OPTEND   EQU   *                                          CMT15380
192A   4F50 5449 4F4E      1533  OPTION   DC    C'OPTION',0,0,0                            CMT15390
1930   0000
1932   0000
1934   0000
1936   5255 4E20 2020      1534  RUN      DC    C'RUN   ',0,0,0                           CMT15400
193C   0000
193E   0000
1940   0000
1942   434F 4E20 2020      1535  CON      DC    C'CON   ',0,Z(ZERONE),0
1948   0000
194A   340A
194C   0000
194E   FFFF                1536           DC    -1                                        CMT15410
1950   0007                1537  MAXTST   DC    7                                         CMT15420
1952   FC00                1538  DEFTESTS DC    X'FC00',0                                 CMT15430
1954   0000
1956   1B74                1539  TESTS    DC    TEST0,TEST1,TEST2,TEST3                   CMT15440
1958   1CCC
195A   1DA2
195C   1EB6
195E   233E                1540           DC    TEST4,TEST5,TEST6,TEST7                   CMT15450
1960   244C
1962   255A
1964   27AA
1966   0000                1541  INTLVL   DC    0,0                                       CMT15460
1968   0000
196A   0000                1542  DEVINT   DC    0,0,0                                     CMT15470
196C   0000
196E   0000
```

EXEC - ETPE R03P2 (W/CONDITIONAL ASSEMBLY)

```
1970   00F0                 1543  DEVSADR  DC    X'F0',X'85',0,-1                                  CMT15480
1972   0085
1974   0000
1976   FFFF
1978   434F 4D4D 4F4E 204D  1544  TITLE    DC    C'COMMON MAGNETIC TAPE TEST PROGRAM 06-172R03',X'D00'  CMT15490
1980   4147 4E45 5449 4320
1988   5441 5045 2054 4553
1990   5420 5052 4F47 5241
1998   4D20 3036 2D31 3732
19A0   5230 3320
19A4   0D00
```

SUBROUTINE INIT

```
                                1546  *-----------------------------------                                  CMT15510
                                1547  *                                                                     CMT15520
                                1548  * SUBROUTINE INIT                                                    *CMT15530
                                1549  *        THIS ROUTINE INITIALIZES THE TEST. IT IS CALLED BY          *CMT15540
                                1550  *        ETPE  IT CHECKS FOR FALSE SYNC FROM DEVICES REQUESTED.      *CMT15550
                                1551  *        AND DO THE NORMAL HOUSE CLEANING.                           *CMT15560
                                1552  *        IF THE TEST IS EXECUTED THE FIRST TIME AFTER LOADING,       *CMT15570
                                1553  *        IT ALSO FORCES THE EXECUTION OF TEST 0 AND SET UP THE       *CMT15580
                                1554  *        10MS TIMER CONSTANT                                         *CMT15590
                                1555  *                                                                    *CMT15600
                                1556  *        CALLING SEQUENCE:                                           *CMT15610
                                1557  *        BAL   R15,INIT                                              *CMT15620
                                1558  * ********************************************************************CMT15630
                                1559  *                                                                     *CMT15640
19A6  4800 1924                 1560  INIT     LH    R0,TIMVAL+6        GET TIMVAL OPTION FOR 1MS DELAY    CMT15650
19AA  2410                      1561           LIS   R1,0                                                   CMT15660
19AC  2440                      1562           LIS   R4,0                                                   CMT15670
19AE  2421                      1563           LIS   R2,1                                                   CMT15680
19B0  2439                      1564           LIS   R3,9                                                   CMT15690
19B2  0A40                      1565  INIT.1   AHR   R4,R0                LOOP TO GET VALUE FOR 10MS         CMT15700
19B4  C110 19B2                 1566           BXLE  R1,INIT.1            DELAY IN R4                       CMT15710
19B8  4040 0A1E                 1567           STH   R4,TIME              STORE 10MS DELAY TIME             CMT15720
19BC  48F0 16C4                 1568           LH    R15,MOD32                                              CMT15730
19C0  4330 19E4                 1569           BZ    TESTAB                                                 CMT15740
19C4  D360 17CD                 1570  TESTAA2  LB    R6,MREAD+11                                            CMT15750
19C8  0866                      1571           LHR   R6,R6                                                  CMT15760
19CA  4230 1A10                 1572           BNZ   TESTAA1                                                CMT15770
19CE  4860 3632                 1573  TESTAA0  LH    R6,RADDRS+2                                            CMT15780
19D2  0866                      1574           LHR   R6,R6                                                  CMT15790
19D4  4230 19FC                 1575           BNZ   TELAST                                                 CMT15800
19D8  C860 3A3A                 1576           LHI   R6,RBUFF                                               CMT15810
19DC  4060 3632                 1577           STH   R6,RADDRS+2                                            CMT15820
19E0  4300 1A10                 1578           B     TESTAA1                                                CMT15830
19E4  4860 3630                 1579  TESTAB   LH    R6,RADDRS                                              CMT15840
19E8  4890 362C                 1580           LH    R9,WADDRS                                              CMT15850
19EC  0866                      1581           LHR   R6,R6                                                  CMT15860
19EE  2137                      1582           BNZS  TELAST                                                 CMT15870
19F0  C860 3A3A                 1583           LHI   R6,RBUFF                                               CMT15880
19F4  4060 3630                 1584           STH   R6,RADDRS                                              CMT15890
19F8  4300 1A2E                 1585           B     TELAST0                                                CMT15900
19FC  C560 3A3A                 1586  TELAST   CLHI  R6,RBUFF                                             CMT15910
1A00  2335                      1587           BES   CHEKI2                                                 CMT15920
1A02  4560 3638                 1588           CLH   R6,LAST                                                CMT15930
1A06  4280 1AB2                 1589           BTC   8,MESSAG                                               CMT15940
1A0A  C8FF                      1590  CHEKI2   LHR   R15,R15                                               CMT15950
1A0C  4330 1A2E                 1591           BZ    TELAST0                                                CMT15960
1A10  D390 17D9                 1592  TESTAA1  LB    R9,MWRITE+11                                           CMT15970
1A14  0899                      1593           LHR   R9,R9                                                  CMT15980
1A16  4230 1A6E                 1594           BNZ   TESTAA                                                 CMT15990
1A1A  4890 362E                 1595           LH    R9,WADDRS+2                                            CMT16000
1A1E  0899                      1596           LHR   R9,R9                                                  CMT16010
1A20  4230 1A5A                 1597           BNZ   TELAST1                                                CMT16020
1A24  C890 363A                 1598           LHI   R9,WBUFF                                               CMT16030
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SUBROUTINE INIT

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1A28  4090 362E        1599           STH   R9,WADDRS+2                                  CMT16040
1A2C  230A             1600           BS    RINI                                        CMT16050
1A2E  C590 363A        1601  TELAST0  CLHI  R9,WBUFF                                    CMT16060
1A32  2337             1602           BES   RINI                                        CMT16070
1A34  0899             1603           LHR   R9,R9                                       CMT16080
1A36  2137             1604           BNZS  TESTAB1                                     CMT16090
1A38  C890 363A        1605           LHI   R9,WBUFF                                    CMT16100
1A3C  4090 362C        1606           STH   R9,WADDRS                                   CMT16110
1A40  4300 1AC8        1607  RINI     B     INI                                         CMT16120
1A44  0569             1608  TESTAB1  CLHR  R6,R9                                       CMT16130
1A46  2384             1609           BNLS  CONT1                                       CMT16140
1A48  0879             1610           LHR   R7,R9                                       CMT16150
1A4A  0B76             1611           SHR   R7,R6                                       CMT16160
1A4C  2303             1612           BS    COMP1                                       CMT16170
1A4E  0876             1613  CONT1    LHR   R7,R6                                       CMT16180
1A50  0B79             1614           SHR   R7,R9                                       CMT16190
1A52  C570 0402        1615  COMP1    CLHI  R7,X'402'                                   CMT16200
1A56  4280 1AA8        1616           BTC   8,MESAGE                                    CMT16210
1A5A  C590 363A        1617  TELAST1  CLHI  R9,WBUFF                                    CMT16220
1A5E  223F             1618           BES   RINI                                        CMT16230
1A60  4590 3638        1619           CLH   R9,LAST                                     CMT16240
1A64  4280 1ABC        1620           BTC   8,MESSAGE                                   CMT16250
1A68  08FF             1621  CHEKI1   LHR   R15,R15                                     CMT16260
1A6A  4330 1AC8        1622           BZ    INI                                         CMT16270
1A6E  D360 17CD        1623  TESTAA   LB    R6,MREAD+11                                 CMT16280
1A72  4870 17C8        1524           LH    R7,MREAD+6                                  CMT16290
1A76  D380 17D9        1625           LB    R8,MWRITE+11                                CMT16300
1A7A  4890 17D4        1626           LH    R9,MWRITE+6                                 CMT16310
1A7E  ED60 0010        1627           SLL   R6,16                                       CMT16320
1A82  0667             1628           DC    X'0667'                                     CMT16330
1A84  ED80 0010        1629           SLL   R8,16                                       CMT16340
1A88  0689             1630           DC    X'0689'                                     CMT16350
1A8A  0568             1631           DC    X'0568'                                     CMT16360
1A8C  2187             1632           BLS   CONEIT                                      CMT16370
1A8E  C870 0402        1633  CONSIX   LHI   R7,X'402'                                  CMT16380
1A92  0A87             1634           DC    X'0A87'                                     CMT16390
1A94  0568             1635           DC    X'0568'          CLR R6,R8                  CMT16400
1A96  2189             1636           BLS   MESAGE                                      CMT16410
1A98  2306             1637           BS    RINI2                                       CMT16420
1A9A  C870 0402        1638  CONEIT   LHI   R7,X'402'                                  CMT16430
1A9E  0A67             1639           DC    X'0A67'          AR R6,R7                   CMT16440
1AA0  0586             1640           DC    X'0586'          CLR R8,R6                  CMT16450
1AA2  2183             1641           BLS   MESAGE                                      CMT16460
1AA4  4300 1AC8        1642  RINI2    B     INI                                         CMT16470
1AA8  C850 35EE        1643  MESAGE   LHI   R5,LAABEL                                  CMT16480
1AAC  41F0 112A        1644           BAL   LINK,PRINT                                  CMT16490
1AB0  230A             1645           BS    ROPTIN                                      CMT16500
1AB2  C850 35A4        1646  MESSAG   LHI   R5,LABBEL                                  CMT16510
1AB6  41F0 112A        1647           BAL   LINK,PRINT                                  CMT16520
1ABA  2305             1648           BS    ROPTIN                                      CMT16530
1ABC  C850 35C8        1649  MESSAGE  LHI   R5,LABELL                                  CMT16540
1AC0  41F0 112A        1650           BAL   LINK,PRINT                                  CMT16550
1AC4  4300 0AE6        1651  ROPTIN   B     OPTIN                                       CMT16560
```

SUBROUTINE INIT

```
1AC8  4850 1840  1652  INI     LH    R5,MODE+6                                  CMT16570
1ACC  2334       1653          BZS   SELCHK                                     CMT16580
1ACE  C550 0002  1654          CLHI  R5,2              SELCH MODE?              CMT16590
1AD2  213B       1655          BNES  SETDEV                                     CMT16600
                 1656  *                                                        CMT16610
                 1657  *       CHECK FOR SELCH FALSE SYNC                       CMT16620
                 1658  *                                                        CMT16630
1AD4  4870 181C  1659  SELCHK  LH    SELCH,SELADR+6    LOAD SELCH ADDRESS       CMT16640
1AD8  4070 1970  1660          STH   SELCH,DEVSADR                              CMT16650
1ADC  4070 16D0  1661          STH   SELCH,ERRDEV                               CMT16660
1AE0  DE70 347E  1662          OC    SELCH,STOP        STOP SELCH               CMT16670
1AE4  4240 1B66  1663          BTC   4,FALSYN          INSTRUCTION TIMED OUT    CMT16680
                 1664  *                                                        CMT16690
                 1665  *       CHECK FOR DEVICE FALSE SYNC.                     CMT16700
                 1666  *                                                        CMT16710
1AE8  4860 1804  1667  SETDEV  LH    DEV,DEVADR+6      LOAD DEVICE ADDRESS      CMT16720
1AEC  4060 1972  1668          STH   DEV,DEVSADR+2                              CMT16730
1AF0  4060 16D0  1669          STH   DEV,ERRDEV                                 CMT16740
1AF4  DE60 348A  1670          OC    DEV,DISARM        DISARM DEVICE            CMT16750
1AF8  4240 1B66  1671          BTC   4,FALSYN          INSTRUCTION TIMED OUT    CMT16760
1AFC  DE60 347F  1672          OC    DEV,CLEAR         CLEAR DEVICE             CMT16770
1B00  41F0 33FC  1673          BAL   RET,REWIND        REWIND TAPE              CMT16780
1B04  4860 1810  1674          LH    DEV,DV2ADR+6      GET SECOND DEVICE ADDRESS CMT16790
1B08  4060 1974  1675          STH   DEV,DEVSADR+4                              CMT16800
1B0C  233B       1676          BZS   SETTRK                                     CMT16810
1B0E  4060 16D0  1677          STH   DEV,ERRDEV                                 CMT16820
1B12  DE60 348A  1678          OC    DEV,DISARM        DISARM DEVICE            CMT16830
1B16  4240 1B66  1679          BTC   4,FALSYN          INSTRUCTION TIMED OUT    CMT16840
1B1A  DE60 347F  1680          OC    DEV,CLEAR         CLEAR DEVICE             CMT16850
1B1E  41E0 33FC  1681          BAL   RET,REWIND        REWIND TAPE              CMT16860
                 1682  *                                                        CMT16870
                 1683  *       SET UP TRACK MASK                                CMT16880
                 1684  *                                                        CMT16890
1B22  48C0 184C  1685  SETTRK  LH    R12,TRACK+6       LOAD TRACK NUMBER        CMT16900
1B26  C5C0 0007  1686          CLHI  R12,7             SEVEN?                   CMT16910
1B2A  2134       1687          BNES  NINE              NO - NINE                CMT16920
1B2C  C8C0 3F3F  1688          LHI   R12,X'3F3F'       7-TRACK MASK             CMT16930
1B30  2302       1689          BS    SETMSK                                     CMT16940
1B32  25C1       1690  NINE     LCS   R12,1             9-TRACK MASK             CMT16950
1B34  40C0 3464  1691  SETMSK  STH   R12,MASK                                    CMT16960
                 1692  *                                                        CMT16970
                 1693  *       RESET FLAGS                                      CMT16980
                 1694  *                                                        CMT16990
1B38  48C0 1828  1695          LH    R12,INTLEV+6      C                        CMT17000
1B3C  D2C0 1966  1696          STB   R12,INTLVL                                 CMT17010
1B40  D2C0 1967  1697          STB   R12,INTLVL+1                               CMT17020
1B44  07CC       1698          XHR   R12,R12                                    CMT17030
1B46  40C0 346A  1699          STH   R12,EOTFLG                                 CMT17040
1B4A  40C0 3470  1700          STH   R12,RTYCNT                                 CMT17050
1B4E  40C0 346C  1701          STH   R12,ERRFLG                                 CMT17060
1B52  40C0 346E  1702          STH   R12,MODFLG                                 CMT17070
1B56  40C0 3476  1703          STH   R12,WLRS                                   CMT17080
1B5A  40C0 3474  1704          STH   R12,DEV2                                   CMT17090
```

SUBROUTINE INIT

```
1B5E  40C0 3468          1705           STH   R12,DE                                CMT17100
1B62  4300 0D9A          1706           B     INITRET                              CMT17110
                         1707  *                                                    CMT17120
                         1708  *                                                    CMT17130
                         1709  *        ERROR 00  -  DEVICE FALSE SYNC.             CMT17140
                         1710  *                                                    CMT17150
1B66  9D65               1711  FALSYN   SSR   DEV,STAT            SYNC ERROR       CMT17160
1B68  C800 3030          1712           LHI   R0,C'00'            ERROR 00         CMT17170
1B6C  41F0 0F82          1713           BAL   R15,ERRDS                            CMT17180
1B70  4300 0AE6          1714           B     OPTIN                                CMT17190
                         1715  *---------------------------------                  CMT17200
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                        1717  * ****************************************************************      CMT17220
                        1718  *                                                                *      CMT17230
                        1719  *                          T E S T 0                             *      CMT17240
                        1720  *                                                                *      CMT17250
                        1721  *    PURPOSE:                                                    *      CMT17260
                        1722  *        TO TEST THE WRITE-BACKSPACE-READ ABILITY OF THE DEVICE   *      CMT17270
                        1723  *        AND DETECT ERRORS ON DATA TRANSFER                      *      CMT17280
                        1724  *                                                                *      CMT17290
                        1725  *    ASSUMPTIONS:                                                *      CMT17300
                        1726  *        THIS TEST ASSUMES THAT THE MEMORY TEST, THE PROCESSOR   *      CMT17310
                        1727  *        TEST AND THE TTY BASIC CONFIDENCE TEST HAD BEEN RUN     *      CMT17320
                        1728  *        WITHOUT DETECTING ANY FAILURE                           *      CMT17330
                        1729  *                                                                *      CMT17340
                        1730  *    DESIGN SPECIFICATIONS:                                      *      CMT17350
                        1731  *        THIS TEST USES THE WRITE-BACKSPACE-READ FEATURE TO       *      CMT17360
                        1732  *        GENERATE FILES OF VARIOUS TEST PATTERNS. THE TEST       *      CMT17370
                        1733  *        PATTERNS ARE STORED IN BLOCKS OF 8 BYTES EACH. EACH     *      CMT17380
                        1734  *        BLOCK IS A SERIES OF DATA WHICH WILL SWITCH THE DATA    *      CMT17390
                        1735  *        LINES IN WORST CASE CONDITION. AT THE BEGINNING OF      *      CMT17400
                        1736  *        THE GENERATION OF A FILE, A BLOCK OF TEST PATTERN IS    *      CMT17410
                        1737  *        REPEATLY COPIED INTO THE WRITE BUFFER UNTIL THE         *      CMT17420
                        1738  *        BUFFER IS FULL. THE DATA IN THE BUFFER IS THEN          *      CMT17430
                        1739  *        WRITTEN ONTO THE TAPE AS A RECORD. THE RECORD IS        *      CMT17440
                        1740  *        BACKSPACED AND READ INTO THE READ BUFFER. THE TWO       *      CMT17450
                        1741  *        BUFFERS ARE COMPARED FOR PROPER DATA TRANSFER.          *      CMT17460
                        1742  *                                                                *      CMT17470
                        1743  *    HOW TO RUN THE TEST:                                        *      CMT17480
                        1744  *        MOUNT THE TAPE ON THE DRIVE AND TURN DEVICE ON LINE.    *      CMT17490
                        1745  *        ENTER OPTIONS VIA CONSOLE DEVICE AND SELECT TEST 0.     *      CMT17500
                        1746  *        (REFER TO PUBLICATION 06-172A15 FOR CONSOLE INPUTS.)    *      CMT17510
                        1747  *        THE TEST IS EXECUTED UPON ENTERING RUN, AND CAN BE      *      CMT17520
                        1748  *        TERMINATED BY THE USER AT ANY TIME BY DEPRESSING        *      CMT17530
                        1749  *        BREAK OR TAKING DEVICE OFF LINE.                        *      CMT17540
                        1750  *                                                                *      CMT17550
                        1751  *    NOTE:                                                       *      CMT17560
                        1752  *        THIS TEST IS FORCED TO BE EXECUTED AT LEAST ONCE        *      CMT17570
                        1753  *        EACH TIME WHEN A NON-ZERO VALUE IS ENTERED UNDER        *      CMT17580
                        1754  *        OPTION DEVADR OR DV2ADR.                                *      CMT17590
                        1755  *                                                                *      CMT17600
                        1756  *    OPTIONS:                                                    *      CMT17610
                        1757  *        TEST, LOOP, CONTIN, NOMSG, DEVADR, SELCH, MODE, TRACK,  *      CMT17620
                        1758  *        INTLEV, MODE, TRACK, RECFIL                             *      CMT17630
                        1759  *        WSTART,RSTART                                           *      CMT17640
                        1760  *                                                                *      CMT17650
                        1761  *    ERRORS:                                                     *      CMT17660
                        1762  *        00, 01, 02, 04, 05, 06, 07, 08, 10, 11, 12, 13, 14,     *      CMT17670
                        1763  *        15, 46, 47, 50                                          *      CMT17680
                        1764  *                                                                *      CMT17690
                        1765  * ****************************************************************      CMT17700
                        1766  *                                                                       CMT17710
1B74   C840 1B7C        1767  TEST0    LHI   R4,TEST01          STARTING ADDRESS SET UP FOR         CMT17720
1B78   41E0 2B7E        1768           BAL   R14,TSTSUP         SECOND DEVICE TEST                  CMT17730
1B7C   41E0 2B36        1769  TEST01   BAL   R14,TSTINIT        TEST INITIALIZE                     CMT17740
```

TEST 0 BASIC CONFIDENCE TEST

```
1B80  41D0 324C          1770           BAL   R13,WAIT1          WAIT FOR NMTN=1                CMT17750
1B84  41E0 2BB8          1771           BAL   R14,FSTEOF         WRITE & SENSE EOF              CMT17760
1B88  41D0 31BE          1772           BAL   R13,WAIT2                                         CMT17770
1B8C  DE60 3483          1773           OC    DEV,BKSPAC         CHECK BACKSPACE FUNCTION       CMT17780
1B90  41F0 2FEE          1774           BAL   R14,SENS03         CHECK FOR EOF                  CMT17790
1B94  4300 2B96          1775           B     CHKEND1                                           CMT17800
1B98  41D0 31BE          1776  REOF01   BAL   R13,WAIT2                                         CMT17810
1B9C  DE60 3484          1777           OC    DEV,READ           READ OVER EOF                  CMT17820
1BA0  41E0 2FE8          1778           BAL   R14,SENS02         EOF SENSED?                    CMT17830
1BA4  4300 1C82          1779           B     EOFER01            NO - READ EOF RETRY            CMT17840
1BA8  0755               1780           XHR   R5,R5                                             CMT17850
1BAA  4050 3470          1781           STH   R5,RTYCNT                                         CMT17860
1BAE  2422               1782  PROC00   LIS   R2,2                                             CMT17870
1BB0  2436               1783           LIS   R3,6                                             CMT17880
1BB2  2491               1784           LIS   R9,1                                             CMT17890
1BB4  48A0 1858          1785           LH    R10,RECFIL+6                                      CMT17900
1BB8  41E0 2F0E          1786           BAL   R14,RESET          SET BUFFER LIMITS              CMT17910
1BBC  07BB               1787           XHR   R11,R11                                           CMT17920
1BBE  0788               1788           XHR   R8,R8                                            CMT17930
1BC0  081B               1789  MOVDT1   LHR   R1,R11           GENERATE 256 BYTE RECORD       CMT17940
1BC2  4841 348C          1790  MOVDT2   LH    CHAR,WDATA(R1)    FROM 8 BYTE DATA BLOCKS        CMT17950
1BC6  4440 3464          1791  MOVDT3   NH    CHAR,MASK         BY COPYING THE BLOCK INTO      CMT17960
1BCA  D080 3F88          1792           STM   R8,RSAVE1                                         CMT17970
1BCE  D1F0 3618          1793  HA1      LM    R15,WLIM                                          CMT17980
1BD2  0A8F               1794           AHR   R8,R15                                           CMT17990
1BD4  4048 0000          1795           STH   CHAR,0(R8)                                       CMT18000
1BD8  D180 3F88          1796           LM    R8,RSAVE1                                        CMT18010
1BDC  2305               1797           BS    HY1                                              CMT18020
1BDE  D180 3F88          1798  HX1      LM    R8,RSAVE1                                        CMT18030
1BE2  4048 363A          1799           STH   CHAR,WBUFF(R8)                                   CMT18040
1BE6  0A82               1800  HY1      AHR   R8,R2                                            CMT18050
1BE8  C110 1BC2          1801           BXLE  R1,MOVDT2                                        CMT18060
1BEC  4580 3466          1802           CLH   R8,NBYTE                                         CMT18070
1BF0  4280 1BC0          1803           BL    MOVDT1                                           CMT18080
1BF4  C840 C3C3          1804           LHI   CHAR,X'C3C3'       DELIMITER CHARACTER            CMT18090
1BF8  D080 3F88          1805           STM   R8,RSAVE1                                        CMT18100
1BFC  D1F0 3620          1806  HA2      LM    R15,RLIM                                         CMT18110
1C00  0A8F               1807           AHR   R8,R15                                           CMT18120
1C02  2681               1808           AIS   R8,1                                             CMT18130
1C04  D248 0000          1809           STB   CHAR,0(R8)                                       CMT18140
1C08  D180 3F88          1810           LM    R8,RSAVE1                                        CMT18150
1C0C  2305               1811           BS    HY2                                              CMT18160
1C0E  D180 3F88          1812  HX2      LM    R8,RSAVE1                                        CMT18170
1C12  D248 3A3B          1813           STB   CHAR,RBUFF+1(R8)                                 CMT18180
1C16  2481               1814  HY2      LIS   R8,1             COUNTER FOR NUMBER OF RECORDS  CMT18190
1C18  41C0 2C3A          1815  GENFIL   BAL   R12,WRTREC        WRITE A RECORD                 CMT18200
1C1C  4300 1C8E          1816           B     WRTER0           ERROR RETURN                   CMT18210
1C20  0755               1817           XHR   R5,R5                                            CMT18220
1C22  4050 3470          1818           STH   R5,RTYCNT        RESET RETRY COUNTER            CMT18230
1C26  41E0 2BEC          1819  PROC01   BAL   R14,BSPACE        BACKSPACE & STATUS CHECK       CMT18240
1C2A  41C0 2CF4          1820  RERDR    BAL   R12,RDREC          READ A RECORD                  CMT18250
1C2E  4300 1CB0          1821           B     RDER0            ERROR RETURN                   CMT18260
1C32  0755               1822           XHR   R5,R5                                            CMT18270
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1C34  4050 3470  1823           STH   R5,RTYCNT          RESET RETRY COUNTER                CMT18280
1C38  41E0 2E34  1824  PROC03   BAL   R14,COMPAR          COMPARE DATA                       CMT18290
1C3C  4850 1900  1825           LH    R5,SDUMP+6         BUFFER DUMP?                       CMT18300
1C40  2333       1826           BZS   NODUMP             NO - NO DUMP                       CMT18310
1C42  41E0 2F90  1827           BAL   R14,DUMP           DUMP READ BUFFER                   CMT18320
1C46  C180 1C18  1828  NODUMP   BXLE  R8,GENFIL                                             CMT18330
1C4A  41D0 31BE  1829  WEOF02   BAL   R13,WAIT2          WAIT FOR NMTN = 1                  CMT18340
1C4E  9D65       1830           SSR   DEV,STAT                                             CMT18350
1C50  C350 0020  1831           THI   STAT,X'20'         EOT?                               CMT18360
1C54  2333       1832           BZS   EOFMRK                                               CMT18370
1C56  41E0 33FC  1833           BAL   RET,REWIND         REWIND TAPE                        CMT18380
1C5A  DE60 348B  1834  EOFMRK   OC    DEV,WEOF                                            CMT18390
1C5E  41E0 2FE2  1835           BAL   R14,SENS01                                           CMT18400
1C62  4300 1CC0  1836           B     EOFER02                                              CMT18410
1C66  0755       1837           XHR   R5,R5                                                CMT18420
1C68  4050 3470  1838           STH   R5,RTYCNT                                            CMT18430
1C6C  0788       1839  PROC02   XHR   R8,R8              CHECK NEXT DATA BLOCK              CMT18440
1C6E  08B1       1840           LHR   R11,R1                                               CMT18450
1C70  2638       1841           AIS   R3,8                                                 CMT18460
1C72  4841 348C  1842           LH    CHAR,WDATA(R1)                                       CMT18470
1C76  4230 1BC6  1843           BNZ   MOVDT3             ZERO?                             CMT18480
1C7A  41D0 3026  1844           BAL   R13,TSTMOD         YES - CHECK NEXT MODE             CMT18490
1C7E  4300 1BAE  1845           B     PROC00                                               CMT18500
                 1846  *                                                                   CMT18510
                 1847  *        ERROR RECOVERY PROCEDURES                                  CMT18520
                 1848  *                                                                   CMT18530
1C82  41E0 304A  1849  EOFER01  BAL   R14,RETRY          RETRY READ EOF                     CMT18540
1C86  4300 1B98  1850           B     REOF01                                               CMT18550
1C8A  4300 1BAE  1851           B     PROC00                                               CMT18560
1C8E  48E0 346A  1852  WRTER0   LH    R14,EOTFLG         WRITE ERROR RETRY                 CMT18570
1C92  2337       1853           BZS   RCOVR              EOT? - NO - RETRY                 CMT18580
1C94  41E0 33FC  1854           BAL   RET,REWIND         REWIND TAPE                       CMT18590
1C98  41E0 2B88  1855           BAL   R14,FSTEOF         WRITE & SENSE EOF                 CMT18600
1C9C  4300 1C18  1856           B     GENFIL                                               CMT18610
1CA0  41E0 300E  1857  RCOVR    BAL   R14,ERRMSG2                                          CMT18620
1CA4  41E0 304A  1858           BAL   R14,RETRY          RETRY 5 TIMES                     CMT18630
1CA8  4300 1C18  1859           B     GENFIL                                               CMT18640
1CAC  4300 1C26  1860           B     PROC01                                               CMT18650
1CB0  41E0 300E  1861  RDER0    BAL   R14,ERRMSG2                                          CMT18660
1CB4  41E0 304A  1862           BAL   R14,RETRY          READ ERROR - RETRY 5 TIMES        CMT18670
1CB8  4300 1C2A  1863           B     RERDR                                                CMT18680
1CBC  4300 1C38  1864           B     PROC03                                               CMT18690
1CC0  41F0 304A  1865  EOFER02  BAL   R14,RETRY          RETRY WEOF                        CMT18700
1CC4  4300 1C4A  1866           B     WEOF02                                               CMT18710
1CC8  4300 1C6C  1867           B     PROC02                                               CMT18720
```

TEST 1 VARIABLE RECORD LENGTH

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                                1869  * ************************************************************** CMT18740
                                1870  *                                                              * CMT18750
                                1871  *                          T E S T 1                           * CMT18760
                                1872  *                                                              * CMT18770
                                1873  *    PURPOSE:                                                  * CMT18780
                                1874  *        TO TEST THE ABILITY OF THE DEVICE TO WRITE AND READ   * CMT18790
                                1875  *        VARIABLE LENGTH RECORDS.                              * CMT18800
                                1876  *                                                              * CMT18810
                                1877  *    ASSUMPTIONS:                                              * CMT18820
                                1878  *        THIS TEST ASSUMES THAT TEST 0 HAD BEEN RUN WITHOUT    * CMT18830
                                1879  *        DETECTING ANY FAILURE.                                * CMT18840
                                1880  *                                                              * CMT18850
                                1881  *    DESIGN SPECIFICATIONS:                                    * CMT18860
                                1882  *        THIS TEST USES THE WRITE-BACKSPACE-READ FEATURE TO    * CMT18870
                                1883  *        GENERATE FILES WITH VARIABLE LENGTH RECORDS. THE      * CMT18880
                                1884  *        RECORDS ARE GENERATED IN THE WRITE BUFFER WITH A      * CMT18890
                                1885  *        MINIMUM OF 2 BYTES. THE RECORDS WRITTEN VARIES FROM   * CMT18900
                                1886  *        00-01 TO 00-FF (OR 00-3F FOR 7 TRACK MAG. TAPE.)      * CMT18910
                                1887  *        THE TOTAL NUMBER OF FILES GENERATED IS DETERMINED      * CMT18920
                                1888  *        BY THE OPTION FILES.                                  * CMT18930
                                1889  *                                                              * CMT18940
                                1890  *    HOW TO RUN THE TEST:                                      * CMT18950
                                1891  *        REFER TO TEST 0. SELECT TEST 1 AND ITS APPROPRIATE    * CMT18960
                                1892  *        OPTIONS.                                              * CMT18970
                                1893  *                                                              * CMT18980
                                1894  *    OPTIONS:                                                  * CMT18990
                                1895  *        TEST, LOOP, CONTIN, NOMSG, DEVADR, DV2ADR, SELCH,     * CMT19000
                                1896  *        INTLEV, MODE, TRACK, RECFIL, FILES  DUMP              * CMT19010
                                1897  *        WSTART,RSTART                                         * CMT19020
                                1898  *                                                              * CMT19030
                                1899  *    ERRORS:                                                   * CMT19040
                                1900  *        00, 01, 02, 04, 05, 08, 10, 11, 12, 13, 14, 15, 46,   * CMT19050
                                1901  *        47, 50                                                * CMT19060
                                1902  *                                                              * CMT19070
                                1903  * ************************************************************** CMT19080
                                1904  *                                                              CMT19090
1CCC   C840 1CD4                1905  TEST1    LHI   R4,TEST11          STARTING ADDRESS SET UP FOR   CMT19100
1CD0   41E0 2B7E                1906           BAL   R14,TSTSUP         SECOND DEVICE TEST            CMT19110
1CD4   41E0 2B36                1907  TEST11   BAL   R14,TSTINIT       TEST INITIALIZE               CMT19120
1CD8   41D0 324C                1908           BAL   R13,WAIT1          WAIT FOR NMTN=1               CMT19130
1CDC   41E0 2BB8                1909           BAL   R14,FSTEOF         WRITE & SENSE EOF             CMT19140
1CE0   41E0 2F38                1910           BAL   R14,BSET                                         CMT19150
1CE4   2491                     1911           LIS   R9,1                                             CMT19160
1CE6   48A0 1858                1912           LH    R10,RECFIL+6       RECORD PER FILE DESIRED       CMT19170
1CEA   2421                     1913           LIS   R2,1                                             CMT19180
1CEC   4830 1870                1914           LH    R3,FILES+6                                       CMT19190
1CF0   2411                     1915  NXTMOD1  LIS   R1,1                                             CMT19200
1CF2   2482                     1916  VARFIL   LIS   R8,2                                             CMT19210
1CF4   9358                     1917  VARREC   LBR   R5,R8                                           CMT19220
1CF6   4450 3464                1918           NH    R5,MASK                                          CMT19230
1CFA   2132                     1919           BNZS  GENFIL1A                                         CMT19240
1CFC   2451                     1920           LIS   R5,1                                             CMT19250
1CFE   4050 3466                1921  GENFIL1A STH   R5,NBYTE                                        CMT19260
```

TEST 1 VARIABLE RECORD LENGTH

```
1D02  41E0 2F0E          1922             BAL   R14,RESET          RESET BUFFER LIMITS                CMT19270
1D06  41C0 2C3A          1923  GENFIL1    BAL   R12,WRTREC         WRITE A RECORD                     CMT19280
1D0A  4300 1D64          1924             B     WRTER1                                                CMT19290
1D0E  0755               1925             XHR   R5,R5                                                CMT19300
1D10  4050 3470          1926             STH   R5,RTYCNT                                            CMT19310
1D14  41E0 2BEC          1927  PROC11     BAL   R14,BSPACE         BACKSPACE & STATUS CHECK           CMT19320
1D18  41C0 2CF4          1928  RERDR1     BAL   R12,RDREC          READ A RECORD                      CMT19330
1D1C  4300 1D86          1929             B     RDER1                                                 CMT19340
1D20  0755               1930             XHR   R5,R5                                                CMT19350
1D22  4050 3470          1931             STH   R5,RTYCNT                                            CMT19360
1D26  41E0 2E34          1932  PROC12     BAL   R14,COMPAR         COMPARE DATA                       CMT19370
1D2A  4850 1900          1933             LH    R5,SDUMP+6         DUMP?                              CMT19380
1D2E  2333               1934             BZS   NODMP1                                               CMT19390
1D30  41E0 2F90          1935             BAL   R14,DUMP           YES - DUMP READ BUFFER             CMT19400
1D34  C180 1CF4          1936  NODMP1     BXLE  R8,VARREC                                            CMT19410
1D38  41D0 31BE          1937  WEOF12     BAL   R13,WAIT2                                            CMT19420
1D3C  C350 0020          1938             THI   STAT,X'20'                                           CMT19430
1D40  2333               1939             BZS   EOFMRK1                                              CMT19440
1D42  41E0 33FC          1940             BAL   RET,REWIND         REWIND TAPE                        CMT19450
1D46  DE60 348B          1941  EOFMRK1    OC    DEV,WEOF           WRITE EOF                          CMT19460
1D4A  41E0 2FE2          1942             BAL   R14,SENS01         CHECK FOR EOF WRITTEN              CMT19470
1D4E  4300 1D96          1943             B     EOFER12                                              CMT19480
1D52  0755               1944             XHR   R5,R5                                                CMT19490
1D54  4050 3470          1945             STH   R5,RTYCNT                                            CMT19500
1D58  C110 1CF2          1946  PROC13     BXLE  R1,VARFIL                                            CMT19510
1D5C  41D0 3026          1947             BAL   R13,TSTMOD         NEXT MODE?                         CMT19520
1D60  4300 1CF0          1948             B     NXTMOD1                                              CMT19530
                         1949  *                                                                    *  CMT19540
                         1950  *          ERROR RECOVERY PROCEDURE                                    CMT19550
                         1951  *                                                                    *  CMT19560
1D64  48E0 346A          1952  WRTER1     LH    R14,EOTFLG         WRITE ERROR RECOVERY               CMT19570
1D68  2337               1953             BZS   RCOVR1             EOT? - NO - RETRY                  CMT19580
1D6A  41E0 33FC          1954             BAL   RET,REWIND         REWIND TAPE                        CMT19590
1D6E  41E0 2BB8          1955             BAL   R14,FSTEOF         WRITE & SENSE EOF                  CMT19600
1D72  4300 1D06          1956             B     GENFIL1            REPEAT WRITE PROCESS               CMT19610
1D76  41E0 300E          1957  RCOVR1     BAL   R14,ERRMSG2                                           CMT19620
1D7A  41E0 304A          1958             BAL   R14,RETRY          RETRY 5 TIMES                      CMT19630
1D7E  4300 1D06          1959             B     GENFIL1                                              CMT19640
1D82  4300 1D14          1960             B     PROC11                                               CMT19650
1D86  41E0 300E          1961  RDER1      BAL   R14,ERRMSG2                                           CMT19660
1D8A  41E0 304A          1962             BAL   R14,RETRY          RETRY 5 TIMES                      CMT19670
1D8E  4300 1D18          1963             B     RERDR1                                               CMT19680
1D92  4300 1D26          1964             B     PROC12                                               CMT19690
1D96  41E0 304A          1965  EOFER12    BAL   R14,RETRY          RETRY 5 TIMES                      CMT19700
1D9A  4300 1D38          1966             B     WEOF12                                               CMT19710
1D9E  4300 1D58          1967             B     PROC13                                               CMT19720
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```
                                1969  * ***************************************************************** CMT19740
                                1970  *                                                                 * CMT19750
                                1971  *                          T E S T 2                              * CMT19760
                                1972  *                                                                 * CMT19770
                                1973  *    PURPOSE:                                                     * CMT19780
                                1974  *        TO TEST REWIND AND SKIP FUNCTIONS.                       * CMT19790
                                1975  *                                                                 * CMT19800
                                1976  *    ASSUMPTIONS:                                                 * CMT19810
                                1977  *        THIS TEST ASSUMES THAT TEST 0 HAD BEEN RUN WITHOUT       * CMT19820
                                1978  *        DETECTING ANY FAILURE.                                   * CMT19830
                                1979  *                                                                 * CMT19840
                                1980  *  DESIGN SPECIFICATIONS:                                         * CMT19850
                                1981  *        THIS TEST GENERATES A FILE WITH EOF MARKS AT BOTH        * CMT19860
                                1982  *        ENDS OF THE FILE. IT THEN REWINDS AND CHECK FOR          * CMT19870
                                1983  *        NMTN=1 AND BOT. IT SKIPS EOF'S OVER THE FILE FOR AS      * CMT19880
                                1984  *        MANY TIMES AS IS SPECIFIED BY OPTION REPEAT.             * CMT19890
                                1985  *        THE FILE IS THEN READ AND THE WRITE & READ BUFFERS       * CMT19900
                                1986  *        ARE COMPARED TO MAKE SURE THAT THE SKIP OPERATIONS       * CMT19910
                                1987  *        DID NOT MISPOSITION THE READER HEAD.                     * CMT19920
                                1988  *                                                                 * CMT19930
                                1989  *    HOW TO RUN THE TEST:                                         * CMT19940
                                1990  *        REFER TO TEST 0. SELECT TEST 2 AND ITS APPROPRIATE       * CMT19950
                                1991  *        OPTIONS.                                                 * CMT19960
                                1992  *                                                                 * CMT19970
                                1993  *    OPTIONS:                                                     * CMT19980
                                1994  *        TEST, LOOP, CONTIN, NOMSG, DEVADR, DV2ADR, SELCH,        * CMT19990
                                1995  *        INTLEV, MODE, TRACK, RECFIL, REPEAT                      * CMT20000
                                1996  *        WSTART,RSTART                                            * CMT20010
                                1997  *                                                                 * CMT20020
                                1998  *    ERRORS:                                                      * CMT20030
                                1999  *        00, 01, 02, 04, 05, 06, 07, 09, 10, 11, 12, 13, 14,      * CMT20040
                                2000  *        15, 46, 47, 50                                           * CMT20050
                                2001  *                                                                 * CMT20060
                                2002  * ***************************************************************** CMT20070
                                2003  *                                                                   CMT20080
1DA2  C840 1DAA                 2004  TEST2     LHI   R4,TEST21          STARTING ADDRESS SET UP FOR    CMT20090
1DA6  41E0 2B7E                 2005            BAL   R14,TSTSUP         SECOND DEVICE TEST             CMT20100
1DAA  41E0 2B36                 2006  TEST21    BAL   R14,TSTINIT        TEST INITIALIZE                CMT20110
1DAE  41E0 33FC                 2007            BAL   RET,REWIND         REWIND TAPE                    CMT20120
1DB2  41E0 2BB8                 2008            BAL   R14,FSTEOF         WRITE & SENSE EOF              CMT20130
1DB6  41E0 2F0E                 2009            BAL   R14,RESET          SET BUFFER LIMITS              CMT20140
1DBA  41E0 2F38                 2010            BAL   R14,BSET           SET WRITE BUFFER               CMT20150
1DBE  2421                      2011            LIS   R2,1                                              CMT20160
1DC0  4830 1858                 2012            LH    R3,RECFIL+6        RECORD PER FILE                CMT20170
1DC4  2411                      2013            LIS   R1,1                                              CMT20180
1DC6  41C0 2C3A                 2014  GENFIL2   BAL   R12,WRTREC         WRITE A RECORD                 CMT20190
1DCA  4300 1E6E                 2015            B     WRTER2                                            CMT20200
1DCE  0755                      2016            XHR   R5,R5                                             CMT20210
1DD0  4050 3470                 2017            STH   R5,BTYCNT                                         CMT20220
1DD4  C110 1DC6                 2018  PROC21    BXLE  R1,GENFIL2                                        CMT20230
1DD8  41D0 31BE                 2019  TAPEND    BAL   R13,WAIT2                                         CMT20240
1DDC  41E0 2BB8                 2020            BAL   R14,FSTEOF         WRITE & SENSE EOF              CMT20250
1DE0  2491                      2021            LIS   R9,1                                              CMT20260
```

TEST 2 REWIND AND SKIP

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1DE2  24A1          2022          LIS   R10,1                                    CMT20270
1DE4  4830 187C     2023          LH    R3,REPEAT+6        NUMBER OF SKIP FUNCTIONS CMT20280
1DE8  0711          2024          XHR   R1,R1                                    CMT20290
1DEA  0531          2025          CLHR  R3,R1                                    CMT20300
1DEC  2332          2026          BES   REPEAT0                                  CMT20310
1DEE  2731          2027          SIS   R3,1                                     CMT20320
1DF0  41E0 33FC     2028  REPEAT0 BAL   RET,REWIND         REWIND TAPE          CMT20330
1DF4  9D65          2029          SSR   DEV,STAT                                 CMT20340
1DF6  C350 0020     2030          THI   STAT,X'20'         EOT?                 CMT20350
1DFA  2137          2031          BNZS  SKPFWD                                   CMT20360
1DFC  C800 3039     2032          LHI   R0,C'09'           NO - ERROR 09        CMT20370
1E00  41F0 0F82     2033          BAL   R15,ERRDS                                CMT20380
1E04  4300 2B9A     2034          B     CHKEND                                   CMT20390
1E08  0788          2035  SKPFWD  XHR   R8,R8                                    CMT20400
1E0A  41D0 31BE     2036  SKPFOR  BAL   R13,WAIT2           WAIT FOR NMTN=1      CMT20410
1E0E  DE60 3486     2037          OC    DEV,SKIPF          SKIP FILE FORWARD    CMT20420
1E12  41E0 2FEE     2038          BAL   R14,SENS03          CHECK FOR EOF        CMT20430
1E16  4300 1E6A     2039          B     RERD2              NO EOF - ABORT TEST  CMT20440
1E1A  C180 1E0A     2040          BXLE  R8,SKPFOR                                CMT20450
1E1E  0788          2041          XHR   R8,R8                                    CMT20460
1E20  41D0 31BE     2042  SKPRVS  BAL   R13,WAIT2           WAIT FOR NMTN=1      CMT20470
1E24  DE60 3487     2043          OC    DEV,SKIPR          SKIP FILE REVERSE    CMT20480
1E28  41E0 2FEE     2044          BAL   R14,SENS03          CHECK FOR EOF        CMT20490
1E2C  4300 1E6A     2045          B     RERD2              NO EOF - ABORT TEST  CMT20500
1E30  C180 1E20     2046          BXLE  R8,SKPRVS                                CMT20510
1E34  C110 1E08     2047          BXLE  R1,SKPFWD                                CMT20520
1E38  4830 1858     2048          LH    R3,RECFIL+6        NUMBER OF RECORDS IN FILE CMT20530
1E3C  41D0 31BE     2049  REOF21  BAL   R13,WAIT2           WAIT FOR NMTN =1     CMT20540
1E40  DE60 3484     2050          OC    DEV,READ           READ PASS EOF        CMT20550
1E44  41E0 2FE8     2051          BAL   R14,SENS02          CHECK FOR EOF        CMT20560
1E48  4300 1E90     2052          B     EOFER21                                  CMT20570
1E4C  0755          2053          XHR   R5,R5                                    CMT20580
1E4E  4050 3470     2054          STH   R5,RTYCNT                                CMT20590
1E52  2411          2055  PROC24  LIS   R1,1                                     CMT20600
1E54  41C0 2CF4     2056  RERDR21 BAL   R12,RDREC          READ A RECORD        CMT20610
1E58  4300 1E9C     2057          B     RDER21                                   CMT20620
1E5C  0755          2058          XHR   R5,R5                                    CMT20630
1E5E  4050 3470     2059          STH   R5,RTYCNT                                CMT20640
1E62  41E0 2E34     2060  PROC22  BAL   R14,COMPAR          COMPARE DATA         CMT20650
1E66  C110 1E54     2061          BXLE  R1,RERDR21                               CMT20660
1E6A  4300 2B96     2062  RERD2   B     CHKEND1                                  CMT20670
                    2063  *                                                   *  CMT20680
                    2064  *       ERROR RECOVERY PROCEDURE                    *  CMT20690
                    2065  *                                                   *  CMT20700
1E6E  48E0 346A     2066  WRTER2  LH    R14,EOTFLG         EOT?                 CMT20710
1E72  2337          2067          BZS   RCOVR2                                   CMT20720
1E74  41D0 31BE     2068          BAL   R13,WAIT2           YES -                CMT20730
1E78  DE60 3483     2069          OC    DEV,BKSPAC         BACKSPACE - END FILE CMT20740
1E7C  4300 1DD8     2070          B     TAPEND                                   CMT20750
1E80  41E0 300E     2071  RCOVR2  BAL   R14,ERRMSG2                            CMT20760
1E84  41E0 304A     2072          BAL   R14,RETRY           RETRY 5 TIMES        CMT20770
1E88  4300 1DC6     2073          B     GENFIL2                                  CMT20780
1E8C  4300 1DD4     2074          B     PROC21                                   CMT20790
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TEST 2 REWIND AND SKIP

```
1E90   41E0 304A          2075  EOFER21  BAL   R14,RETRY          RETRY 5 TIMES                CMT20800
1E94   4300 1E3C          2076           B     REOF21                                          CMT20810
1E98   4300 1E52          2077           B     PROC24                                          CMT20820
1E9C   9D65               2078  RDER21   SSR   DEV,STAT                                       CMT20830
1E9E   C350 0060          2079           THI   STAT,X'60'         EOT OR EOF?                  CMT20840
1EA2   4230 1E6A          2080           BNZ   RERD2              YES - END OF FILE            CMT20850
1EA6   41E0 300E          2081           BAL   R14,ERRMSG2                                     CMT20860
1EAA   41E0 304A          2082           BAL   R14,RETRY          RETRY 5 TIMES                CMT20870
1EAE   4300 1E54          2083           B     RERDR21                                         CMT20880
1EB2   4300 1E62          2084           B     PROC22                                          CMT20890
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2086  * ************************************************************** CMT20910
2087  *                                                                * CMT20920
2088  *                            T E S T 3                           * CMT20930
2089  *                                                                * CMT20940
2090  *    PURPOSE:                                                    CMT20950
2091  *        THIS TEST CHECKS ALL DEVICE FUNCTIONS UNDER DEVICE      * CMT20960
2092  *        INTERRUPT. IT CHECKS FOR PROPER INTERRUPT RECEPTION,    * CMT20970
2093  *        INTERRUPT QUEUING AND INTERRUPT DISARM & DISABLE.       * CMT20980
2094  *                                                                * CMT20990
2095  *    ASSUMPTIONS:                                                CMT21000
2096  *        THIS TEST ASSUMES THAT TESTS 0, 1 & 2 HAD BEEN RUN      * CMT21010
2097  *        WITHOUT DETECTING ANY FAILURE.                          * CMT21020
2098  *                                                                * CMT21030
2099  *    DESIGN SPECIFICATIONS:                                      CMT21040
2100  *        THE USER CAN SPECIFY THE PARTICULAR FUNCTIONS HE        * CMT21050
2101  *        WISHES TO TEST BY SELECTING THE PROPER OPTIONS (SEE     * CMT21060
2102  *        PROGRAM DESCRIPTION 06-172A15, SECTION 6.4). DEFAULT    * CMT21070
2103  *        OPTIONS EXECUTED ARE WRITE, BACKSPACE, READ AND SKIP.   * CMT21080
2104  *        THE TEST FIRST WILL CHECK IF INTERRUPT CAN BE DISARMED, * CMT21090
2105  *        DISABLED AND QUEUED. IT THEN GENERATES A FILE, ENDS     * CMT21100
2106  *        IT WITH AN EOF. BACKSPACE OVER IT AND READ IT. IT       * CMT21110
2107  *        REWINDS THE TAPE AND SKIPS FORWARD AND REVERSE OVER     * CMT21120
2108  *        THE FILE. ALL FUNCTIONS ARE PERFORMED UNDER INTERRUPTS, * CMT21130
2109  *        IF ONLY WRITE & READ ARE SPECIFIED. THE TEST REWINDS    * CMT21140
2110  *        THE TAPE BEFORE PROCEEDING TO READ THE FILE. SETTING    * CMT21150
2111  *        WEOF OPTION WILL WRITE EOF'S TO THE END OF TAPE.        * CMT21160
2112  *        (SEE APPENDIX 6 OF PUBLICATION 06-172R00A15)            * CMT21170
2113  *                                                                * CMT21180
2114  *        THE RECORD SIZE IN THIS TEST CAN BE VARIED BY THE       * CMT21190
2115  *        OPTION BYTES. THE LIMITS ARE FROM 2 TO X'400'. IF       * CMT21200
2116  *        THE USER WISHES TO INCREASE THE UPPER LIMIT, HE MAY     * CMT21210
2117  *        DO SO BY INCREASING THE CONTENT OF LOCATION LABELLED    * CMT21220
2118  *        "X400". IT MUST BE NOTED THAT THE LOWER LIMIT           * CMT21230
2119  *        CANNOT BE LESS THAN 2 AND THE HIGHER LIMIT MUST         * CMT21240
2120  *        NOT BE CHANGED TO A VALUE HIGHER THAN X'7FFF'.          * CMT21250
2121  *                                                                * CMT21260
2122  *    HOW TO RUN TEST:                                            CMT21270
2123  *        REFER TO TEST 0. SELECT THE DESIRED OPTIONS AND         * CMT21280
2124  *        TEST 3. IF DU IS SET, THE TEST WILL PRINT THE           * CMT21290
2125  *        MESSAGE: "TURN DEVICE OFF-LINE MOMENTARILY."            * CMT21300
2126  *        THE DEVICE MUST BE TURN OFF LINE WITHIN 60 SECONDS      * CMT21310
2127  *        AFTER THE MESSAGE, BUT MUST NOT STAY OFF-LINE FOR       * CMT21320
2128  *        MORE THAN 30 SECONDS.                                   * CMT21330
2129  *                                                                * CMT21340
2130  *    OPTIONS:                                                    * CMT21350
2131  *        TEST, LOOP, CONTIN, NOMSG, DEVADR, DV2ADR, SELCH,       * CMT21360
2132  *        INTLEV, MODE, TRACK, RECFIL, WRITE, READ, BKSPAC,       * CMT21370
2133  *        SKIP, DU                                                * CMT21380
2134  *        WSTART,RSTART                                           * CMT21390
2135  *                                                                * CMT21400
2136  *    ERRORS:                                                     * CMT21410
2137  *        00, 01, 02, 04, 05, 07, 08, 10, 11, 20, 21, 22, 23,     * CMT21420
2138  *        24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37,     * CMT21430
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                        2139  *        38, 39, 46, 47, 50.                                  *   CMT21440
                        2140  *                                                             *   CMT21450
                        2141  * ***********************************************************     CMT21460
                        2142  *                                                                 CMT21470
1EB6   C840 1EBE        2143  TEST3    LHI   R4,TEST31          STARTING ADDRESS SET UP FOR     CMT21480
1EBA   41E0 2B7E        2144           BAL   R14,TSTSUP         SECOND DEVICE TEST              CMT21490
1EBE   41E0 2B36        2145  TEST31   BAL   R14,TSTINIT       TEST INITIALIZE                 CMT21500
1EC2   4060 1972        2146           STH   DEV,DEVSADR+2                                     CMT21510
1EC6   41D0 324C        2147           BAL   R13,WAIT1          WAIT FOR NMTN=1                 CMT21520
1ECA   4850 1894        2148           LH    R5,DUINT+6         DU OPTION?                      CMT21530
1ECE   4330 1EF4        2149           BZ    NORINT                                            CMT21540
                        2150  *                                                                 CMT21550
                        2151  *        TEST DU INTERRUPT (0-1)                                  CMT21560
                        2152  *                                                                 CMT21570
1ED2   C850 2284        2153           LHI   R5,RTNDU1                                         CMT21580
1ED6   4050 196C        2154           STH   R5,DEVINT+2                                       CMT21590
1EDA   DE60 3489        2155           OC    DEV,ENABL          ENABLE DEVICE                   CMT21600
1EDE   C850 3580        2156           LHI   R5,MSG10                                          CMT21610
1EE2   41F0 112A        2157           BAL   R15,PRINT                                         CMT21620
1EE6   41F0 126A        2158           BAL   R15,TSTBRK         CHECK BREAK KEY                 CMT21630
1EEA   C8E0 3332        2159           LHI   R11,C'32'          ERROR 32                        CMT21640
1EEE   41E0 319A        2160           BAL   R14,TIMEOUT                                       CMT21650
1EF2   1770             2161           DC    H'6000'                                           CMT21660
                        2162  *                                                                 CMT21670
                        2163  *        TEST INTERRUPT DISARM                                    CMT21680
                        2164  *                                                                 CMT21690
1EF4   C850 2272        2165  NORINT   LHI   R5,RTNDSM          SET UP RETURN ADDRESS FOR       CMT21700
1EF8   4050 196C        2166           STH   R5,DEVINT+2        DISARM ERROR                    CMT21710
1EFC   DE60 348A        2167           OC    DEV,DISARM         DISARM DEVICE                   CMT21720
1F00   41E0 33FC        2168           BAL   RET,REWIND         REWIND TAPE                     CMT21730
1F04   4840 0A22        2169           LH    R4,PSW                                            CMT21740
1F08   9554             2170           EPSR  R5,R4              ENABLE PSW INTERRUPT            CMT21750
1F0A   4200 0000        2171           NOP                      WAIT FOR ERRONOUS INTERRUPT     CMT21760
1F0E   C840 30F0        2172           LHI   R4,X'30F0'         DISABLE PSW INTERRUPT           CMT21770
1F12   9554             2173           EPSR  R5,R4                                             CMT21780
1F14   4850 1864        2174           LH    R5,NOBYTE+6        SET UP RECORD LENGTH            CMT21790
1F18   2751             2175           SIS   R5,1                                              CMT21800
1F1A   4050 3466        2176           STH   R5,NBYTE                                          CMT21810
1F1E   41E0 2F0E        2177           BAL   R14,RESET                                         CMT21820
1F22   41E0 2F38        2178           BAL   R14,BSET           SET UP WRITE BUFFER            CMT21830
1F26   2491             2179           LIS   R9,1               RECORD COUNT                   CMT21840
1F28   48A0 1858        2180           LH    R10,RECFIL+6       NUMBER OF RECORDS PER FILE     CMT21850
1F2C   41D0 324C        2181  NXTMOD3  BAL   R13,WAIT1                                         CMT21860
1F30   4850 18AC        2182           LH    R5,OPWRT+6         WRITE OPTION SET?              CMT21870
1F34   2135             2183           BNZS  EOFLOP                                            CMT21880
1F36   4850 18A0        2184           LH    R5,OPRD+6          READ OPTION ?                  CMT21890
1F3A   4230 21A4        2185           BNZ   RDONLY                                            CMT21900
                        2186  *                                                                 CMT21910
                        2187  *        TEST INTERRUPT DISABLE                                   CMT21920
                        2188  *                                                                 CMT21930
1F3E   C850 2278        2189  EOFLOP   LHI   R5,RTNDSB          SET UP RETURN ADDRESS FOR       CMT21940
1F42   4050 196C        2190           STH   R5,DEVINT+2        DISABLE ERROR                   CMT21950
1F46   DE60 348A        2191           OC    DEV,DISARM         DISARM DEVICE INTERRUPTS        CMT21960
```

TEST 3 INTERRUPT TEST

```
1F4A  DE60 3488          2192           OC    DEV,DSABL          DISABLE DEVICE                          CMT21970
1F4E  41E0 2BB8          2193           BAL   R14,FSTEOF         WRITE & SENSE EOF                       CMT21980
1F52  41D0 31BE          2194           BAL   R13,WAIT2          WAIT FOR NMTN=1                         CMT21990
1F56  4840 0A22          2195           LH    R4,PSW                                                     CMT22000
1F5A  9554               2196           EPSR  R5,R4              ENABLE PSW INTERRUPT                    CMT22010
1F5C  4200 0000          2197           NOP                      WAIT FOR ERRONOUS INTERRUPT             CMT22020
1F60  C840 30F0          2198           LHI   R4,X'30F0'         DISABLE PSW INTERRUPT                   CMT22030
1F64  9554               2199           EPSR  R5,R4                                                      CMT22040
                         2200  *                                                                         CMT22050
                         2201  *        TEST INTERRUPT QUEUING                                           CMT22060
                         2202  *                                                                         CMT22070
1F66  C850 1F7C          2203           LHI   R5,RTN01           SET UP RETURN ADDRESS 01                CMT22080
1F6A  4050 196C          2204           STH   R5,DEVINT+2                                                CMT22090
1F6E  DE60 3489          2205           OC    DEV,ENABL          ENABL DEVICE                            CMT22100
1F72  C8B0 3337          2206           LHI   R11,C'37'          ERROR 37                                CMT22110
1F76  41E0 319A          2207           BAL   R14,TIMEOUT        WAIT FOR INTERRUPT                      CMT22120
1F7A  0002               2208           DC    H'2'                                                       CMT22130
                         2209  *                                                                         CMT22140
                         2210  *        TEST INTERRUPT AFTER REWIND                                      CMT22150
                         2211  *                                                                         CMT22160
1F7C  C850 1FA2          2212  RTN01    LHI   R5,RTN02           SET UP RETURN ADDRESS 02                CMT22170
1F80  4050 196C          2213           STH   R5,DEVINT+2                                                CMT22180
1F84  DE60 348A          2214           OC    DEV,DISARM         DISARM INTERRUPTS                       CMT22190
1F88  DE60 3489          2215           OC    DEV,ENABL          ENABLE DEVICE INTERRUPT                 CMT22200
1F8C  DE60 3482          2216           OC    DEV,REWD           REWIND                                  CMT22210
1F90  C8B0 3230          2217           LHI   R11,C'20'          ERROR 20                                CMT22220
1F94  41E0 319A          2218           BAL   R14,TIMEOUT        WAIT FOR INTERRUPT                      CMT22230
1F98  03E8               2219           DC    H'1000'                                                    CMT22240
1F9A  41D0 324C          2220           BAL   R13,WAIT1          WAIT FOR NMTN=1                         CMT22250
1F9E  4300 1FC6          2221           B     LPEOF                                                      CMT22260
1FA2  D350 16D2          2222  RTN02    LB    STAT,INTSTA        GET INTERRUPT STATUS                    CMT22270
1FA6  C550 0034          2223           CLHI  STAT,X'34'         X'34'                                   CMT22280
1FAA  4330 1FC6          2224           BE    LPEOF              YES - GO ON                             CMT22290
1FAE  C800 3039          2225  STER02   LHI   R0,C'09'           NO - ERROR 09                           CMT22300
1FB2  C350 0001          2226  STAERR   THI   STAT,1             DU?                                     CMT22310
1FB6  4230 32A0          2227           BNZ   MTDU                                                       CMT22320
1FBA  41F0 0F82          2228  STERR2   BAL   R15,ERRDS                                                  CMT22330
1FBE  DE60 348A          2229           OC    DEV,DISARM                                                 CMT22340
1FC2  4300 2B96          2230           B     CHKEND1                                                    CMT22350
                         2231  *                                                                         CMT22360
                         2232  *        TEST INTERRUPTS AFTER WRITE EOF                                  CMT22370
                         2233  *                                                                         CMT22380
1FC6  C850 1FE8          2234  LPEOF    LHI   R5,RTN03           SET RETURN ADDRESS 03                   CMT22390
1FCA  4050 196C          2235           STH   R5,DEVINT+2                                                CMT22400
1FCE  DE60 348A          2236           OC    DEV,DISARM         DISARM INTERRUPTS                       CMT22410
1FD2  DE60 3489          2237           OC    DEV,ENABL          ENABLE DEVICE INTERRUPT                 CMT22420
1FD6  DE60 348B          2238           OC    DEV,WEOF           WRITE EOF                               CMT22430
1FDA  C8B0 3231          2239           LHI   R11,C'21'          ERROR 21                                CMT22440
1FDE  41E0 319A          2240           BAL   R14,TIMEOUT        WAIT FOR INTERRUPT                      CMT22450
1FE2  0064               2241           DC    H'100'                                                     CMT22460
1FE4  4300 205C          2242           B     STA05A                                                     CMT22470
1FE8  D350 16D2          2243  RTN03    LB    STAT,INTSTA        CHECK STATUS FOR                        CMT22480
1FEC  C550 004C          2244           CLHI  STAT,X'4C'         EX INTERRUPT                            CMT22490
```

TEST 3 INTERRUPT TEST

```
1FF0  4230 2038          2245           BNE   STAERR1                                                  CMT22500
1FF4  C850 200A          2246  STA03    LHI   R5,RTN04          SET UP RETURN ADDRESS 04               CMT22510
1FF8  4050 196C          2247           STH   R5,DEVINT+2                                              CMT22520
1FFC  C8B0 3232          2248           LHI   R11,C'22'         ERROR 22                               CMT22530
2000  41E0 319A          2249           BAL   R14,TIMEOUT       WAIT FOR NEXT INTERRUPT                CMT22540
2004  000A               2250           DC    H'10'                                                    CMT22550
2006  4300 205C          2251           B     STA05A                                                   CMT22560
200A  D350 16D2          2252  RTN04    LB    STAT,INTSTA       CHECK STATUS FOR                       CMT22570
200E  C550 0046          2253           CLHI  STAT,X'46'        EOM INTERRUPT                          CMT22580
2012  4230 2038          2254           BNE   STAERR1                                                  CMT22590
2016  C850 202C          2255  STA04    LHI   R5,RTN05          SET UP RETURN ADDRESS 05               CMT22600
201A  4050 196C          2256           STH   R5,DEVINT+2                                              CMT22610
201E  C8B0 3233          2257           LHI   R11,C'23'         ERROR 23                               CMT22620
2022  41E0 319A          2258           BAL   R14,TIMEOUT       WAIT FOR THIRD INTERRUPT               CMT22630
2026  000A               2259           DC    H'10'                                                    CMT22640
2028  4300 205C          2260           B     STA05A                                                   CMT22650
202C  D350 16D2          2261  RTN05    LB    STAT,INTSTA       GET INTERRUPT STATUS                   CMT22660
2030  C550 0056          2262           CLHI  STAT,X'56'        CHECK STATUS FOR NMTN INTERRUPT        CMT22670
2034  4330 2060          2263           BE    STA05             YES - GO ON                            CMT22680
2038  C350 0001          2264  STAERR1  THI   STAT,1             DU?                                    CMT22690
203C  4230 32A0          2265           BNZ   MTDU                                                     CMT22700
2040  C800 3035          2266           LHI   R0,C'05'          ERROR 05                               CMT22710
2044  C350 0020          2267           THI   STAT,X'20'        EOT?                                   CMT22720
2048  4330 1FB2          2268           BZ    STAERR                                                   CMT22730
204C  C850 3506          2269           LHI   R5,MSG04          YES -                                  CMT22740
2050  41E0 112A          2270           BAL   R15,PRINT                                                CMT22750
2054  DE60 348A          2271           OC    DEV,DISARM                                               CMT22760
2058  4300 2B96          2272           B     CHKEND1                                                  CMT22770
205C  41D0 31BE          2273  STA05A   BAL   R13,WAIT2          WAIT FOR NMTN=1                        CMT22780
2060  4850 18D0          2274  STA05    LH    R5,OPWEOF+6       WEOF OPTION SET?                       CMT22790
2064  4230 1FC6          2275           BNZ   LPEOF                                                    CMT22800
                         2276  *                                                                        CMT22810
                         2277  *        TEST WRITE INTERRUPTS                                           CMT22820
                         2278  *                                                                        CMT22830
2068  2481               2279           LIS   R8,1                                                     CMT22840
206A  DE60 348A          2280  WREC3    OC    DEV,DISARM        DISARM QUEUED INTERRUPTS               CMT22850
206E  4850 346E          2281           LH    R5,MODFLG                                                CMT22860
2072  C550 0002          2282           CLHI  R5,2              SELCH MODE?                            CMT22870
2076  4330 22FE          2283           BE    SELINW                                                   CMT22880
207A  C850 20BA          2284           LHI   R5,RTN06A         NO - SET UP RETURN ADDRESS 06A         CMT22890
207E  4050 196C          2285           STH   R5,DEVINT+2                                              CMT22900
2082  D0F0 3628          2286           STM   R15,RSAV32                                               CMT22910
2086  D1F0 3618          2287           LM    R15,WLIM                                                 CMT22920
208A  08BF               2288           LHR   R11,R15                                                  CMT22930
208C  D1F0 361C          2289           LM    R15,WLIM+4                                               CMT22940
2090  08CF               2290           LHR   R12,R15                                                  CMT22950
2092  D1F0 3628          2291           LM    R15,RSAV32                                               CMT22960
2096  41D0 31BE          2292           BAL   R13,WAIT2          WAIT FOR NMTN=1                        CMT22970
209A  DE60 3485          2293           OC    DEV,WRITE         DEVICE WRITE                           CMT22980
209E  966B               2294           WBR   DEV,R11           WRITE BLOCK                            CMT22990
20A0  9D65               2295           SSR   DEV,STAT                                                 CMT23000
20A2  2081               2296           BTBS  8,1                                                      CMT23010
20A4  DE60 3489          2297  STA06    OC    DEV,ENABL         ENABLE DEVICE INTERRUPT                CMT23020
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20A8  C8B0 3236          2298           LHI   R11,C'26'          ERROR 26                    CMT23030
20AC  41E0 319A          2299           BAL   R14,TIMEOUT        WAIT FOR INTERRUPT          CMT23040
20B0  000A               2300           DC    H'10'                                          CMT23050
20B2  41D0 320C          2301           BAL   R13,WAIT3          WAIT FOR EOM=1              CMT23060
20B6  9D65               2302           SSR   DEV,STAT                                       CMT23070
20B8  2303               2303           BS    RTN06A+4                                       CMT23080
20BA  D350 16D2          2304  RTN06A   LB    STAT,INTSTA        GET INTERRUPT STATUS        CMT23090
20BE  C350 0001          2305           THI   STAT,1             DU?                         CMT23100
20C2  4230 32A0          2306           BNZ   MTDU                                           CMT23110
20C6  C350 0020          2307           THI   STAT,X'20'          EOT?                        CMT23120
20CA  2336               2308           BZS   WRTON3             NO - BRANCH                 CMT23130
20CC  41E0 2BEC          2309           BAL   R14,BSPACE                                     CMT23140
20D0  DE60 347F          2310           OC    DEV,CLEAR                                      CMT23150
20D4  230D               2311           BS    WRTEND                                         CMT23160
20D6  C350 0004          2312  WRTON3   THI   STAT,X'04'          EX?                         CMT23170
20DA  2134               2313           BNZS  STER06A            YES - STATUS ERROR          CMT23180
20DC  C350 0002          2314           THI   STAT,X'02'          EOM INTERRUPT?              CMT23190
20E0  2135               2315           BNZS  STA06A             YES - GO ON                 CMT23200
20E2  C800 3130          2316  STER06A  LHI   R0,C'10'           NO - ERROR 10               CMT23210
20E6  41E0 300E          2317           BAL   R14,ERRMSG2                                    CMT23220
20EA  C180 206A          2318  STA06A   BXLE  R8,WREC3                                       CMT23230
20EE  41D0 31BE          2319  WRTEND   BAL   R13,WAIT2          WAIT FOR NMTN=1             CMT23240
20F2  DE60 348B          2320           OC    DEV,WEOF           WRITE EOF                   CMT23250
20F6  4850 18B8          2321           LH    R5,OPBSP+6         BACKSPACE OPTION SET ?      CMT23260
20FA  4330 22C4          2322           BZ    NOBSP                                          CMT23270
                         2323  *                                                             CMT23280
                         2324  *        TEST BACKSPACE EOF INTERRUPT                         CMT23290
                         2325  *                                                             CMT23300
20FE  C850 2124          2326           LHI   R5,RTN07           SET UP RETURN ADDRESS 07    CMT23310
2102  4050 196C          2327           STH   R5,DEVINT+2                                    CMT23320
2106  41D0 31BE          2328           BAL   R13,WAIT2          WAIT FOR NMTN=1             CMT23330
210A  DE60 348A          2329           OC    DEV,DISARM         DISARM QUEUED INTERRUPTS    CMT23340
210E  DE60 3489          2330           OC    DEV,ENABL          ENABLE DEVICE INTERRUPT     CMT23350
2112  DE60 3483          2331           OC    DEV,BKSPAC         BACKSPACE OVER EOF          CMT23360
2116  C8B0 3234          2332           LHI   R11,C'24'          ERROR 24                    CMT23370
211A  41E0 319A          2333           BAL   R14,TIMEOUT        WAIT FOR INTERRUPT          CMT23380
211E  0032               2334           DC    H'50'                                          CMT23390
2120  4300 29AC          2335           B     BSFIL                                          CMT23400
2124  D350 16D2          2336  RTN07    LB    STAT,INTSTA        GET INTERRUPT STATUS        CMT23410
2128  C550 0046          2337           CLHI  STAT,X'46'                                     CMT23420
212C  2138               2338           BNES  STA07                                          CMT23430
212E  C550 004C          2339           CLHI  STAT,X'4C'                                     CMT23440
2132  2135               2340           BNES  STA07                                          CMT23450
2134  C800 3037          2341           LHI   R0,C'07'           YES - ERROR 07              CMT23460
2138  4300 1FB2          2342           B     STAERR                                         CMT23470
                         2343  *                                                             CMT23480
                         2344  *        TEST BACKSPACE RECORD INTERRUPT                      CMT23490
                         2345  *                                                             CMT23500
213C  C850 2168          2346  STA07    LHI   R5,RTN08           SET UP RETURN ADDRESS 08    CMT23510
2140  4050 196C          2347           STH   R5,DEVINT+2                                    CMT23520
2144  2481               2348           LIS   R8,1                                           CMT23530
2146  41D0 31BE          2349  BSPFIL   BAL   13,WAIT2           WAIT FOR NMTN=1             CMT23540
214A  DE60 348A          2350           OC    DEV,DISARM         DISARM QUEUED INTERRUPTS    CMT23550
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TEST 3 INTERRUPT TEST

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214E  DE60 3489          2351           OC    DEV,ENABL          ENABLE DEVICE INTERRUPT                CMT23560
2152  DE60 3483          2352           OC    DEV,BKSPAC         BACKSPACE OVER A RECORD                CMT23570
2156  C8B0 3235          2353           LHI   R11,C'25'          ERROR 25                               CMT23580
215A  41E0 319A          2354           BAL   R14,TIMEOUT        WAIT FOR INTERRUPT                     CMT23590
215E  0032               2355           DC    H'50'                                                    CMT23600
2160  41D0 320C          2356           BAL   R13,WAIT3          WAIT FOR EOM=1                         CMT23610
2164  4300 2190          2357           B     STA08                                                    CMT23620
2168  D350 16D2          2358  RTN08    LB    STAT,INTSTA        GET INTERRUPT STATUS                   CMT23630
216C  C350 0001          2359           THI   STAT,1             DU?                                    CMT23640
2170  4230 32A0          2360           BNZ   MTDJ                                                     CMT23650
2174  C350 0040          2361           THI   STAT,X'40'         EOF?                                   CMT23660
2178  4230 219C          2362           BNZ   TRYRD                                                    CMT23670
217C  C350 0004          2363           THI   STAT,X'04'         EX?                                    CMT23680
2180  2134               2364           BNZS  STER08             YES - STATUS ERROR                     CMT23690
2182  C350 0002          2365           THI   STAT,X'02'         EOM?                                   CMT23700
2186  2135               2366           BNZS  STA08              YES - GO ON                            CMT23710
2188  C800 3038          2367  STEP08   LHI   R0,C'08'           NO - ERROR 08                          CMT23720
218C  41F0 0F82          2368           BAL   R15,ERRDS                                                CMT23730
2190  C180 2146          2369  STA08    BXLE  R8,BSPFIL                                                CMT23740
2194  41D0 31BE          2370           BAL   R13,WAIT2                                                CMT23750
2198  DE60 3483          2371           OC    DEV,BKSPAC                                               CMT23760
219C  4850 18A0          2372  TRYRD    LH    R5,OPRD+6          READ OPTION SET?                       CMT23770
21A0  4330 223E          2373           BZ    NOREAD                                                   CMT23780
                         2374  *                                                                       CMT23790
                         2375  *        TEST READ INTERRUPTS                                           CMT23800
                         2376  *                                                                       CMT23810
21A4  41D0 31BE          2377  RDONLY   BAL   R13,WAIT2          WAIT FOR NMTN=1                        CMT23820
21A8  DE60 3484          2378           OC    DEV,READ           READ PASS EOF                          CMT23830
21AC  2481               2379           LIS   R8,1                                                     CMT23840
21AE  DE60 348A          2380  RREC3    OC    DEV,DISARM         DISARM QUEUED INTERRUPTS               CMT23850
21B2  41D0 2F62          2381           BAL   R13,CRBUF          CLEAR READ BUFFER                      CMT23860
21B6  4850 346E          2382           LH    R5,MODFLG                                                CMT23870
21BA  C550 0002          2383           CLHI  R5,2               SELCH MODE?                            CMT23880
21BE  4330 231E          2384           BE    SELINR                                                   CMT23890
21C2  C850 21FE          2385           LHI   R5,RTN09A          SET UP RETURN ADDRESS 09A              CMT23900
21C6  4050 196C          2386           STH   R5,DEVINT+2                                              CMT23910
21CA  D0F0 3628          2387           STM   R15,RSAV32         SAVE R15                               CMT23920
21CE  D1F0 3620          2388           LM    R15,RLIM           READ BUFFER ADDRESS                    CMT23930
21D2  08BF               2389           LHR   R11,R15                                                  CMT23940
21D4  D1F0 3624          2390           LM    R15,RLIM+4         END ADDRESS                            CMT23950
21D8  08CF               2391           LHR   R12,R15                                                  CMT23960
21DA  D1F0 3628          2392           LM    R15,RSAV32                                               CMT23970
21DE  41D0 31BE          2393           BAL   R13,WAIT2          WAIT FOR NMTN=1                        CMT23980
21E2  DE60 3484          2394           OC    DEV,READ           DEVICE READ                            CMT23990
21E6  976B               2395           RBR   DEV,R11            READ BLOCK                             CMT24000
21E8  DE60 3489          2396  STA09    OC    DEV,ENABL          ENABLE DEVICE INTERRUPT                CMT24010
21EC  C8B0 3237          2397           LHI   R11,C'27'          ERROR 27                               CMT24020
21F0  41E0 319A          2398           BAL   R14,TIMEOUT        WAIT FOR INTERRUPT                     CMT24030
21F4  0032               2399           DC    H'50'                                                    CMT24040
21F6  41D0 320C          2400           BAL   R13,WAIT3          WAIT FOR EOM=1                         CMT24050
21FA  9D65               2401           SSR   DEV,STAT                                                 CMT24060
21FC  2303               2402           BS    RTN09A+4                                                 CMT24070
21FE  D350 16D2          2403  RTN09A   LB    STAT,INTSTA        GET INTERRUPT STATUS                   CMT24080
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TEST 3 INTERRUPT TEST

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2202  C350 0001          2404            THI   STAT,1              DU?                                CMT24090
2206  4230 32A0          2405            BNZ   MTDU                                                   CMT24100
220A  C350 0060          2406            THI   STAT,X'60'                                             CMT24110
220E  4230 223E          2407            BNZ   NOREAD                                                 CMT24120
2212  C350 0004          2408            THI   STAT,X'04'          EX?                                CMT24130
2216  2134               2409            BNZS  STERO9A                                                CMT24140
2218  C350 0002          2410            THI   STAT,X'02'          EOM?                               CMT24150
221C  2135               2411            BNZS  RDEND                                                  CMT24160
221E  C800 3131          2412  STERO9A   LHI   R0,C'11'            ERROR 11                           CMT24170
2222  41E0 300E          2413            BAL   R14,ERRMSG2                                            CMT24180
2226  4850 18DC          2414  RDEND     LH    R5,CMPRE+6          COMPARE OPTION SET ?               CMT24190
222A  2333               2415            BZS   TRYDUM                                                 CMT24200
222C  41E0 2E34          2416            BAL   R14,COMPAR                                             CMT24210
2230  4850 1900          2417  TRYDUM    LH    R5,SDUMP+6          DUMP OPTION SET                    CMT24220
2234  2333               2418            BZS   CONT3                                                  CMT24230
2236  41E0 2F90          2419            BAL   R14,DUMP            DUMP READ BUFFER                   CMT24240
223A  C180 21AE          2420  CONT3     BXLE  R8,RREC3                                               CMT24250
223E  41E0 33FC          2421  NOREAD    BAL   RET,REWIND          REWIND TAPE                        CMT24260
2242  4850 18C4          2422            LH    R5,OPSKIP+6         SKIP OPTION?                       CMT24270
2246  4330 2262          2423            BZ    ENDTST3                                                CMT24280
                         2424  *                                                                      CMT24290
                         2425  *         TEST SKIP INTERRUPTS                                         CMT24300
                         2426  *                                                                      CMT24310
224A  D310 3486          2427            LB    R1,SKIPF            LOAD SKIP FORWARD COMMAND          CMT24320
224E  C8E0 3330          2428            LHI   R11,C'30'           ERROR 30                           CMT24330
2252  41C0 33A0          2429            BAL   R12,SKIPINT                                            CMT24340
2256  D310 3487          2430            LB    R1,SKIPR            LOAD SKIP REVERSE COMMAND          CMT24350
225A  C8E0 3331          2431            LHI   R11,C'31'           ERROR 31                           CMT24360
225E  41C0 33A0          2432            BAL   R12,SKIPINT                                            CMT24370
2262  DE60 348A          2433  ENDTST3   OC    DEV,DISARM                                             CMT24380
2266  41E0 33FC          2434            BAL   RET,REWIND          REWIND TAPE                        CMT24390
226A  41D0 3026          2435            BAL   R13,TSTMOD                                             CMT24400
226E  4300 1F2C          2436            B     NXTMOD3             NEXT MODE                          CMT24410
                         2437  *                                                                      CMT24420
                         2438  *         DISARM FAILURE                                               CMT24430
                         2439  *                                                                      CMT24440
2272  C800 3338          2440  RTNDSM    LHI   R0,C'38'            ERROR 38                           CMT24450
2276  2303               2441            BS    INTER31                                                CMT24460
                         2442  *                                                                      CMT24470
                         2443  *         DISABLE FAILURE                                              CMT24480
                         2444  *                                                                      CMT24490
2278  C800 3339          2445  RTNDSB    LHI   R0,C'39'            ERROR 39                           CMT24500
227C  D350 16D2          2446  INTER31   LB    STAT,INTSTA         GET INTERRUPT STATUS               CMT24510
2280  4300 1FBA          2447            B     STERR2                                                 CMT24520
                         2448  *                                                                      CMT24530
                         2449  *         DU INTERRUPT                                                 CMT24540
                         2450  *                                                                      CMT24550
2284  D350 16D2          2451  RTNDU1    LB    STAT,INTSTA                                            CMT24560
2288  C350 0001          2452            THI   STAT,X'01'          DU BIT SET?                        CMT24570
228C  4330 22B8          2453            BZ    DUSTER                                                 CMT24580
                         2454  *                                                                      CMT24590
                         2455  *         TEST DU INTERRUPT (1-0)                                      CMT24600
                         2456  *                                                                      CMT24610
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TEST 3 INTERRUPT TEST

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2290  C850 22A6          2457            LHI   R5,RTNDU2                                          CMT24620
2294  4050 196C          2458            STH   R5,DEVINT+2                                        CMT24630
2298  C8B0 3334          2459            LHI   R11,C'34'          ERROR 34                        CMT24640
229C  41E0 319A          2460            BAL   R14,TIMEOUT                                        CMT24650
22A0  0BB8               2461            DC    H'3000'                                            CMT24660
22A2  4300 32A0          2462            B     MTDU                                               CMT24670
22A6  D350 16D2          2463  RTNDU2    LB    STAT,INTSTA                                        CMT24680
22AA  C350 0001          2464            THI   STAT,X'01'         DU BIT SET ?                    CMT24690
22AE  4330 1EF4          2465            BZ    NORINT                                             CMT24700
22B2  C800 3335          2466            LHI   R0,C'35'           ERROR 35                        CMT24710
22B6  2303               2467            BS    DUSTER+4                                           CMT24720
22B8  C800 3333          2468  DUSTER    LHI   R0,C'33'           ERROR 33                        CMT24730
22BC  41F0 0F82          2469            BAL   R15,ERRDS                                          CMT24740
22C0  4300 1EF4          2470            B     NORINT                                             CMT24750
22C4  C850 22EE          2471  NOBSP     LHI   R5,RTN10           NO BACKSPACE OPTION:            CMT24760
22C8  4050 196C          2472            STH   R5,DEVINT+2        SET UP INTERRUPT RETURN ADRS 10 CMT24770
22CC  41D0 31BE          2473            BAL   R13,WAIT2          WAIT FOR NMTN=1                 CMT24780
22D0  DE60 348A          2474            OC    DEV,DISARM         DISARM QUEUED INTERRUPTS        CMT24790
22D4  DE60 3489          2475            OC    DEV,ENABL          ENABLE DEVICE INTERRUPT         CMT24800
22D8  DE60 3482          2476            OC    DEV,REWD           REWIND                          CMT24810
22DC  C8B0 3230          2477            LHI   R11,C'20'          ERROR 20                        CMT24820
22E0  41E0 319A          2478            BAL   R14,TIMEOUT        WAIT FOR INTERRUPT              CMT24830
22E4  03E8               2479            DC    H'1000'                                            CMT24840
22E6  41D0 324C          2480            BAL   R13,WAIT1          WAIT FOR NMTN=1                 CMT24850
22EA  4300 219C          2481            B     TRYRD                                              CMT24860
22EE  D350 16D2          2482  RTN10     LB    STAT,INTSTA        GET INTERRUPT STATUS            CMT24870
22F2  C550 0034          2483            CLHI  STAT,X'34'         ET, NMTN AND EX=1?              CMT24880
22F6  4230 1FAE          2484            BNE   STER02             NO - STATUS ERROR               CMT24890
22FA  4300 219C          2485            B     TRYRD                                              CMT24900
                         2486  *                                                                  CMT24910
                         2487  *         TEST SELCH INTERRUPTS:                                   CMT24920
                         2488  *                                                                  CMT24930
22FE  D310 3485          2489  SELINW    LB    R1,WRITE           DEVICE COMMAND                  CMT24940
2302  D320 3480          2490            LB    R2,GOWRT           SELCH GO & COMMAND              CMT24950
2306  C830 3618          2491            LHI   R3,WLIM            SELCH WRITE LIMITS              CMT24960
230A  C840 20BA          2492            LHI   R4,RTN06A          DEVICE INTERRUPT RETURN ADDRESS CMT24970
230E  C850 3390          2493            LHI   R5,SELINT1         SELCH INTERRUPT RETURN ADDRESS  CMT24980
2312  C8B0 3238          2494            LHI   R11,C'28'          ERROR 28                        CMT24990
2316  41C0 3350          2495            BAL   R12,SELINT                                         CMT25000
231A  4300 20A4          2496            B     STA06                                              CMT25010
231E  D310 3484          2497  SELINR    LB    R1,READ            DEVICE COMMAND                  CMT25020
2322  D320 3481          2498            LB    R2,GORD            SELCH GO & COMMAND              CMT25030
2326  C830 3620          2499            LHI   R3,RLIM            SELCH READ LIMITS               CMT25040
232A  C840 21FE          2500            LHI   R4,RTN09A          DEVICE INTERRUPT RETURN ADDRESS CMT25050
232E  C850 3390          2501            LHI   R5,SELINT1         SELCH INTERRUPT RETURN ADDRESS  CMT25060
2332  C8B0 3239          2502            LHI   R11,C'29'          ERROR 29                        CMT25070
2336  41C0 3350          2503            BAL   R12,SELINT                                         CMT25080
233A  4300 21E8          2504            B     STA09                                              CMT25090
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TEST 4 WRITE LONG/READ SHORT

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                                2506  * ************************************************************          CMT25110
                                2507  *                                                            *          CMT25120
                                2508  *                          T E S T 4                         *          CMT25130
                                2509  *                                                            *          CMT25140
                                2510  *    PURPOSE:                                                          CMT25150
                                2511  *        TO TEST THE PROPER FUNCTIONING OF THE OVERFLOW       *          CMT25160
                                2512  *        CIRCUITRY, AND THE DETECTION OF ABNORMAL I/O         *          CMT25170
                                2513  *        CONDITIONS.                                         *          CMT25180
                                2514  *                                                            *          CMT25190
                                2515  *    ASSUMPTIONS:                                                      CMT25200
                                2516  *        THIS TEST ASSUMES THAT TEST 0 HAD BEEN RUN WITHOUT   *          CMT25210
                                2517  *        DETECTING ANY FAILURE.                              *          CMT25220
                                2518  *                                                            *          CMT25230
                                2519  *    DESIGN SPECIFICATION:                                   *          CMT25240
                                2520  *        A RECORD IS GENERATED AND THE SAME RECORD IS READ    *          CMT25250
                                2521  *        PLUS 32 BYTES. THE PROGRAM TESTS FOR DETECTION OF    *          CMT25260
                                2522  *        ABNORMAL TERMINATION OF THE READ OPERATION.          *          CMT25270
                                2523  *        CONVERSELY, OVERFLOW IS CHECKED BY READING A RECORD  *          CMT25280
                                2524  *        SHORTER THAN THE ONE WRITTEN.                        *          CMT25290
                                2525  *                                                            *          CMT25300
                                2526  *    HOW TO RUN THE TEST:                                    *          CMT25310
                                2527  *        SELECT TEST 4 AND APPROPRIATE OPTIONS, AND ENTER RUN. *          CMT25320
                                2528  *        REFER TO TEST 0.                                    *          CMT25330
                                2529  *                                                            *          CMT25340
                                2530  *    OPTIONS:                                                *          CMT25350
                                2531  *        TEST, LOOP, CONTIN, NOMSG, DEVADR, DV2ADR, SELCH,   *          CMT25360
                                2532  *        INTLEN, MODE, TRACK, RECFIL, DUMP                   *          CMT25370
                                2533  *        WSTART,RSTART                                       *          CMT25380
                                2534  *                                                            *          CMT25390
                                2535  *    ERRORS:                                                 *          CMT25400
                                2536  *        00, 01, 02, 04, 05, 08, 10, 11, 12, 13, 14, 15, 16, *          CMT25410
                                2537  *        17, 18, 46, 47, 50.                                 *          CMT25420
                                2538  *                                                            *          CMT25430
                                2539  * ************************************************************          CMT25440
                                2540  *                                                                      CMT25450
233E  C840 2346                 2541  TEST4     LHI   R4,TEST41          STARTING ADDRESS SET UP FOR        CMT25460
2342  41E0 287E                 2542            BAL   R14,TSTSUP         SECOND DEVICE TEST                 CMT25470
2346  41E0 2836                 2543  TEST41    BAL   R14,TSTINIT        TEST INITIALIZE                    CMT25480
234A  41E0 33FC                 2544  NXTMOD4   BAL   RET,REWIND         REWIND TAPE                        CMT25490
234E  41E0 2888                 2545            BAL   R14,FSTEOF         WRITE & SENSE EOF                  CMT25500
2352  0755                      2546            XHR   R5,R5              CLEAR WRITE-LONG/READ-SHORT FLAG   CMT25510
2354  4050 3476                 2547            STH   R5,WLRS                                               CMT25520
2358  41E0 2F0E                 2548            BAL   R14,RESET          SET BUFFER LIMITS                  CMT25530
235C  41E0 2F38                 2549            BAL   R14,BSET           SET WRITE BUFFER                   CMT25540
2360  D0F0 3628                 2550            STM   R15,RSAV32                                            CMT25550
2364  D1F0 351C                 2551            LM    R15,WLIM+4                                            CMT25560
2368  CBF0 0020                 2552            SHI   R15,32                                                CMT25570
236C  D0F0 361C                 2553            STM   R15,WLIM+4                                            CMT25580
2370  D1F0 3628                 2554            LM    R15,RSAV32                                            CMT25590
2374  48A0 1858                 2555            LH    R10,RECFIL+6       NUMBER OF RECORDS                  CMT25600
2378  2491                      2556            LIS   R9,1                                                  CMT25610
237A  2481                      2557  GENFIL4   LIS   R8,1                                                  CMT25620
237C  41C0 2C3A                 2558  GFIL41    BAL   R12,WRTREC          WRITE A RECORD                     CMT25630
```

TEST 4 WRITE LONG/READ SHORT

```
2380  4300 23F8          2559            B     WRTER4                                                  CMT25640
2384  0755               2560            XHR   R5,R5                                                   CMT25650
2386  4050 3470          2561            STH   R5,RTYCNT                                               CMT25660
238A  41E0 2BEC          2562  PROC41    BAL   R14,BSPACE      BACKSPACE A RECORD                       CMT25670
238E  41C0 2CF4          2563  RERDR4    BAL   R12,RDREC       READ A RECORD                            CMT25680
2392  4300 2410          2564            B     RDER4           ERROR RETURN - CHECK STATUS              CMT25690
2396  C800 3136          2565            LHI   R0,C'16'        NORMAL RETURN - ERROR 16                 CMT25700
239A  41E0 300E          2566            BAL   R14,ERRMSG2                                             CMT25710
239E  41E0 304A          2567            BAL   R14,RETRY       RETRY 5 TIMES                            CMT25720
23A2  4300 238E          2568            B     RERDR4                                                  CMT25730
23A6  4850 1900          2569  PROC42    LH    R5,SDUMP+6      DUMP OPTION?                             CMT25740
23AA  2333               2570            BZS   PROC43                                                  CMT25750
23AC  41E0 2F90          2571            BAL   R14,DUMP        YES - DUMP READ BUFFER                   CMT25760
23B0  C180 237C          2572  PROC43    BXLE  R8,GFIL41       CONTINUE                                 CMT25770
23B4  41D0 31BE          2573            BAL   R13,WAIT2       WAIT FOR MNTN=1                          CMT25780
23B8  DE60 348B          2574            OC    DEV,WEOF                                                CMT25790
23BC  4850 3476          2575  TAPEND4   LH    R5,WLRS         WRITE-LONG/READ-SHORT?                   CMT25800
23C0  2337               2576            BZS   CONT4                                                   CMT25810
23C2  41E0 33FC          2577            BAL   RET,REWIND      REWIND TAPE                              CMT25820
23C6  41D0 3026          2578            BAL   R13,TSTMOD       YES - CHECK MORE MODE                    CMT25830
23CA  4300 234A          2579            B     NXTMOD4                                                 CMT25840
23CE  245F               2580  CONT4     LIS   R5,15           NO - SET WRITE-LONG/READ-SHORT FLAG      CMT25850
23D0  4050 3476          2581            STH   R5,WLRS                                                 CMT25860
23D4  41E0 33FC          2582            BAL   RET,REWIND      REWIND TAPE                              CMT25870
23D8  41E0 2BB8          2583            BAL   R14,FSTEOF      WRITE & SENSE EOF                        CMT25880
23DC  41E0 2F0E          2584            BAL   R14,RESET       SET BUFFER LIMITS                        CMT25890
23E0  D0F0 3628          2585            STM   R15,RSAV32                                              CMT25900
23E4  D1E0 3624          2586            LM    R15,RLIM+4                                              CMT25910
23E8  CBF0 0020          2587            SHI   R15,32                                                  CMT25920
23EC  D0F0 3624          2588            STM   R15,RLIM+4                                              CMT25930
23F0  D1F0 3628          2589            LM    R15,RSAV32                                              CMT25940
23F4  4300 237A          2590            B     GENFIL4         GO TO NEXT STEP                          CMT25950
                         2591  *                                                                       CMT25960
                         2592  *         ERROR PROCEDURE                                               CMT25970
                         2593  *                                                                       CMT25980
23F8  48E0 346A          2594  WRTER4    LH    R14,EOTFLG      EOT?                                     CMT25990
23FC  4230 23BC          2595            BNZ   TAPEND4         YES - END OF STEP                        CMT26000
2400  41E0 300E          2596            BAL   R14,ERRMSG2                                             CMT26010
2404  41E0 304A          2597            BAL   R14,RETRY       RETRY 5 TIMES                            CMT26020
2408  4300 237C          2598            B     GFIL41                                                  CMT26030
240C  4300 238A          2599            B     PROC41                                                  CMT26040
2410  9D65               2600  RDER4     SSR   DEV,STAT                                                CMT26050
2412  4800 3476          2601            LH    R0,WLRS         WRITE-LONG/READ-SHORT?                   CMT26060
2416  4330 2436          2602            BZ    WSRL                                                    CMT26070
241A  C350 0080          2603            THI   STAT,X'80'      YES - ERR SET?                           CMT26080
241E  4230 2442          2604            BNZ   NORMAL          YES - CONTINUE                           CMT26090
2422  C800 3137          2605            LHI   R0,C'17'        NO - ERROR 17                            CMT26100
2426  41E0 300E          2606  WERLS     BAL   R14,ERRMSG2                                             CMT26110
242A  41E0 304A          2607            BAL   R14,RETRY       RETRY 5 TIMES                            CMT26120
242E  4300 238E          2608            B     RERDR4                                                  CMT26130
2432  4300 23A6          2609            B     PROC42                                                  CMT26140
2436  C350 0080          2610  WSRL      THI   STAT,X'80'      ERR SET?                                 CMT26150
243A  2334               2611            BZS   NORMAL          NO - CONTINUE                            CMT26160
```

TEST 4 WRITE LONG/READ SHORT

```
243C  C800 3138          2612           LHI   R0,C'18'          YES - ERROR 18   CMT26170
2440  220D               2613           BS    WERLS                              CMT26180
2442  0755               2614  NORMAL   XHR   R5,R5                              CMT26190
2444  4050 3470          2615           STH   R5,RTYCNT                          CMT26200
2448  4300 23A6          2616           B     PROC42                             CMT26210
```

TEST 5 INTER-RECORD GAP TEST

```
                                2618  * ****************************************************************      CMT26230
                                2619  *                                                              *      CMT26240
                                2620  *                          T E S T 5                           *      CMT26250
                                2621  *                                                              *      CMT26260
                                2622  *    PURPOSE:                                                         CMT26270
                                2623  *        TO TEST THE PROPER GENERATION OF INTER-RECORD-GAPS.    *      CMT26280
                                2624  *        AND DETECTION OF GAP DATA.                            *      CMT26290
                                2625  *        NOTE: PROLONGED REPETITION OF THIS TEST MAY WEAR THE  *      CMT26300
                                2626  *        FRONT PORTION OF THE TAPE.                            *      CMT26310
                                2627  *                                                              *      CMT26320
                                2628  *    ASSUMPTIONS:                                              *      CMT26330
                                2629  *        THIS TEST ASSUMES THAT TESTS 0 AND 4 HAD BEEN RUN     *      CMT26340
                                2630  *        WITHOUT DETECTING ANY FAILURE.                        *      CMT26350
                                2631  *                                                              *      CMT26360
                                2632  *    DESIGN SPECIFICATIONS:                                           CMT26370
                                2633  *        THIS TEST GENERATES LONG (512 BYTES) RECORDS OF        *      CMT26380
                                2634  *        ALL ONES (FF) ON THE TAPE. IT THEN REWINDS AND        *      CMT26390
                                2635  *        WRITE A SHORT RECORD OF VARIOUS DATA (00-FF) OVER      *      CMT26400
                                2636  *        THE SAME PORTION OF THE TAPE FOR 100 TIMES. SINCE     *      CMT26410
                                2637  *        BACKSPACE DOES NOT ALWAYS STOP AT THE SAME SPOT,      *      CMT26420
                                2638  *        ALL THE RECORDS ARE NOT WRITTEN DIRECTLY OVER EACH    *      CMT26430
                                2639  *        OTHER. THE LAST RECORD IS WRITTEN REVERSED. THE       *      CMT26440
                                2640  *        TAPE IS REWOUND AND THE RECORD READ. THE READ IS      *      CMT26450
                                2641  *        REPEATED FOR THE NUMBER OF TIMES AS SPECIFIED BY      *      CMT26460
                                2642  *        OPTION IRG. THIS ENSURES THE PICKING UP OF ANY        *      CMT26470
                                2643  *        DATA LEFT BY THE PREVIOUS RECORDS WRITTEN.            *      CMT26480
                                2644  *                                                              *      CMT26490
                                2645  *    OPTIONS:                                                  *      CMT26500
                                2646  *        TEST, LOOP, CONTIN, NOMSG, DEVADR, DV2ADR, SELCH,     *      CMT26510
                                2647  *        INTLEV, MODE, TRACK, IRG                              *      CMT26520
                                2648  *        WSTART,RSTART                                         *      CMT26530
                                2649  *                                                              *      CMT26540
                                2650  *    ERRORS:                                                   *      CMT26550
                                2651  *        00, 01, 02, 04, 05, 07, 08, 10, 11, 12, 13, 14, 15,   *      CMT26560
                                2652  *        19, 46, 47, 50                                        *      CMT26570
                                2653  *                                                              *      CMT26580
                                2654  * ****************************************************************      CMT26590
                                2655  *                                                                      CMT26600
244C   C840 2454                2656  TEST5    LHI   R4,TEST51          STARTING ADDRESS SET UP FOR          CMT26610
2450   41E0 2B7E                2657           BAL   R14,TSTSUP         SECOND DEVICE TEST                   CMT26620
2454   41E0 2B36                2658  TEST51   BAL   R14,TSTINIT        TEST INITIALIZE                      CMT26630
2458   41E0 33FC                2659           BAL   RET,REWIND         REWIND TAPE                          CMT26640
245C   41E0 2BB8                2660           BAL   R14,FSTEOF         WRITE & SENSE EOF                    CMT26650
2460   2492                     2661           LIS   R9,2                                                    CMT26660
2462   C8A0 01FF                2662           LHI   R10,511            SET UP FOR 512 BYTE RECORD           CMT26670
2466   40A0 3466                2663           STH   R10,NBYTE                                               CMT26680
246A   41E0 2F0E                2664           BAL   R14,RESET          SET BUFFER LIMITS                    CMT26690
246E   0788                     2665           XHR   R8,R8                                                   CMT26700
2470   4840 3464                2666           LH    CHAR,MASK          DATA OF RECORD IS                    CMT26710
2474   D080 3F88                2667  JUNK1    STM   R8,RSAVE1                                              CMT26720
2478   D1F0 3618                2668  HB2      LM    R15,WLIM                                                CMT26730
247C   0AF8                     2669           AHR   R15,R8                                                  CMT26740
247E   404F 0000                2670           STH   CHAR,0(R15)                                             CMT26750
```

TEST 5 INTER-RECORD GAP TEST

```
2482  D180 3F88          2671           LM    R8,RSAVE1                                    CMT26760
2486  2305               2672           BS    HY3                                          CMT26770
2488  D180 3F88          2673  HX3      LM    R8,RSAVE1                                    CMT26780
248C  4048 363A          2674           STH   CHAR,WBUFF(R8)                               CMT26790
2490  C180 2474          2675  HY3      BXLE  R8,JUNK1                                     CMT26800
2494  D350 3465          2676           LB    R5,MASK+1                                    CMT26810
2498  4050 3466          2677           STH   R5,NBYTE                                     CMT26820
249C  2491               2678           LIS   R9,1                                         CMT26830
249E  24A4               2679           LIS   R10,4                  SET UP FOR 4 RECORDS  CMT26840
24A0  0788               2680           XHR   R8,R8                                        CMT26850
24A2  41C0 2C3A          2681  JUNK2    BAL   R12,WRTREC             WRITE 4 LONG RECORDS  CMT26860
24A6  41F0 0F82          2682           BAL   R15,ERRDS                                    CMT26870
24AA  C180 24A2          2683           BXLE  R8,JUNK2                                     CMT26880
24AE  41D0 31BE          2684           BAL   R13,WAIT2                                    CMT26890
24B2  DE60 348B          2685           OC    DEV,WEOF               WRITE EOF MARK        CMT26900
24B6  41E0 33FC          2686           BAL   RET,REWIND             REWIND TAPE           CMT26910
24BA  41E0 2F0E          2687           BAL   R14,RESET              SET BUFFER LIMITS     CMT26920
24BE  41E0 2F38          2688           BAL   R14,BSET               GENERATE WRITE BUFFER CMT26930
24C2  41E0 2BB8          2689           BAL   R14,FSTEOF             WRITE & SENSE EOF     CMT26940
24C6  41D0 31BE          2690           BAL   R13,WAIT2              WAIT FOR NMTN=1       CMT26950
24CA  DE60 3483          2691           OC    DEV,BKSPAC                                   CMT26960
24CE  41E0 2FEE          2692           BAL   R14,SENS03             CHECK FOR EOF         CMT26970
24D2  4300 2B96          2693           B     CHKEND1                NO EOF - ABORT T5ST   CMT26980
24D6  C8A0 0064          2694           LHI   R10,100                SET 100 TIMES         CMT26990
24DA  0788               2695           XHR   R8,R8                                        CMT27000
24DC  41C0 2C3A          2696  CIGCHK   BAL   R12,WRTREC             WRITE A RECORD        CMT27010
24E0  4300 252E          2697           B     WRTER51                                      CMT27020
24E4  41E0 2BEC          2698  PROC51   BAL   R14,BSPACE             BACKSPACE A RECORD    CMT27030
24E8  C180 24DC          2699           BXLE  R8,CIGCHK                                    CMT27040
24EC  41E0 2C0A          2700           BAL   R14,SWAP               REVERSE WRITE BUFFER  CMT27050
24F0  41C0 2C3A          2701           BAL   R12,WRTREC             WRITE A RECORD        CMT27060
24F4  4300 254A          2702           B     WRTER52                                      CMT27070
24F8  41D0 31BE          2703  PROC52   BAL   R13,WAIT2              WAIT FOR NMTN=1       CMT27080
24FC  DE60 348B          2704           OC    DEV,WEOF               WRITE EOF             CMT27090
2500  41E0 33FC          2705           BAL   RET,REWIND             REWIND TAPE           CMT27100
2504  41C0 2CF4          2706           BAL   R12,RDREC              READ A RECORD         CMT27110
2508  41F0 0F82          2707           BAL   R15,ERRDS                                    CMT27120
250C  41E0 2E34          2708           BAL   R14,COMPAR             COMPARE DATA OF LAST RECORD CMT27130
2510  48A0 1888          2709           LH    R10,IRGDAT+6                                 CMT27140
2514  0788               2710           XHR   R8,R8                                        CMT27150
2516  41E0 2BEC          2711  GAPDAT   BAL   R14,BSPACE             BACKSPACE             CMT27160
251A  41C0 2CF4          2712           BAL   R12,RDREC              READ A RECORD         CMT27170
251E  41F0 0F82          2713           BAL   R15,ERRDS                                    CMT27180
2522  41E0 2E34          2714           BAL   R14,COMPAR                                   CMT27190
2526  C180 2516          2715           BXLE  R8,GAPDAT              REPEAT OVER SAME RECORD CMT27200
252A  4300 2B96          2716           B     CHKEND1                                      CMT27210
                         2717  *                                                          CMT27220
                         2718  *        ERROR PROCEDURE                                   CMT27230
                         2719  *                                                          CMT27240
252E  48F0 346A          2720  WRTER51  LH    R15,EOTFLG             EOT?                  CMT27250
2532  2338               2721           BZS   WER51                                        CMT27260
2534  C800 3139          2722  MTNERR   LHI   R0,C'19'               YES - TAPE MOTION ERROR - 19 CMT27270
2538  085F               2723           LHR   R5,R15
```

TEST 5 INTER-RECORD GAP TEST

```
253A   41F0 0F82          2724             BAL    R15,ERRDS                          CMT27280
253E   4300 2B9A          2725             B      CHKEND                             CMT27290
2542   41F0 0F82          2726   WER51     BAL    R15,ERRDS                          CMT27300
2546   4300 24E4          2727             B      PROC51          GO ON              CMT27310
254A   48F0 346A          2728   WRTER52   LH     R15,EOTFLG      EOT?               CMT27320
254E   4230 2534          2729             BNZ    MTNERR                             CMT27330
2552   41F0 0F82          2730             BAL    R15,ERRDS                          CMT27340
2556   4300 24F8          2731             B      PROC52          GO ON              CMT27350
```

```
                    2733  * ****************************************************************      CMT27370
                    2734  *                                                                *      CMT27380
                    2735  *                          T E S T 6                             *      CMT27390
                    2736  *                                                                *      CMT27400
                    2737  *    PURPOSE:                                                    *      CMT27410
                    2738  *        TO CHECK THE CYCLIC REDUNDUNCY CHECK (CRC) CHARACTERS   *      CMT27420
                    2739  *        GENERATED AT THE END OF EACH RECORD WRITTEN.            *      CMT27430
                    2740  *                                                                *      CMT27440
                    2741  *    ASSUMPTIONS:                                                *      CMT27450
                    2742  *        TEST 0 HAD BEEN RUN WITHOUT DETECTING ANY FAILURE       *      CMT27460
                    2743  *                                                                *      CMT27470
                    2744  *    DESIGN SPECIFICATION:                                       *      CMT27480
                    2745  *        IT WAS PRE-CALCULATED THAT THE CRC FOR A RECORD OF      *      CMT27490
                    2746  *        00-FF IS X'2929' AND FOR A RECORD OF FF-00 IS X'6A6A'.   *      CMT27500
                    2747  *        ALTERNATE RECORDS OF THE ABOVE RECORDS ARE WRITTEN.      *      CMT27510
                    2748  *        HARDWARE ADJUSTMENTS SHOULD BE MADE TO ENABLE THE CRC   *      CMT27520
                    2749  *        BEING READ. THE RECORDS ARE READ AND THE CRC CHECKED.   *      CMT27530
                    2750  *                                                                *      CMT27540
                    2751  *    HOW TO RUN THE TEST                                         *      CMT27550
                    2752  *        MAKE SURE THAT THE DEVICE IS A 9 TRACK, 800 BPI         *      CMT27560
                    2753  *        MAGNETIC TAPE SYSTEM, WITH THE INTERFACE BOARD ON       *      CMT27570
                    2754  *        EXTENSION BOARD. SELECT TEST 6 AND SET CRC OPTION.      *      CMT27580
                    2755  *        WHEN THE FILE IS GENERATED, THE MESSAGE:                *      CMT27590
                    2756  *        ADD CRC CAPACITOR AND EXECUTE.                          *      CMT27600
                    2757  *        WILL BE PRINTED, AND THE PROCESSOR HALTED. REFER        *      CMT27610
                    2758  *        TO SECTION 6.2.4 OF PUBLICATION 06-172A15, AND MAKE     *      CMT27620
                    2759  *        THE HARDWARE ADJUSTMENT. THE TEST WILL RESUME BY        *      CMT27630
                    2760  *        DEPRESSING EXE BUTTON. THE ADDED CAPACITOR MUST BE      *      CMT27640
                    2761  *        REMOVED AFTER THE TEST.                                 *      CMT27650
                    2762  *                                                                *      CMT27660
                    2763  *        IF OPTION CRC IS NOT SET OR TRACK IS NOT 9 OR DEVICE    *      CMT27670
                    2764  *        IS NOT 1 THE TEST WILL ONLY PRINT                       *      CMT27680
                    2765  *        TEST 06                                                 *      CMT27690
                    2766  *        AND RETURN TO INPUT COMMAND MODE WITHOUT FURTHER        *      CMT27700
                    2767  *        ACTION                                                  *      CMT27710
                    2768  *                                                                *      CMT27720
                    2769  *    OPTIONS:                                                    *      CMT27730
                    2770  *        TEST, LOOP, CONTIN, NOMSG, DEVADR, DV2ADR, SELCH,       *      CMT27740
                    2771  *        INTLEV, MODE, TRACK, RECFIL, DEVICE, CRC, RDCRC         *      CMT27750
                    2772  *        WSTART,RSTART                                           *      CMT27760
                    2773  *                                                                *      CMT27770
                    2774  *    ERRORS:                                                     *      CMT27780
                    2775  *        00, 01, 02, 04, 05, 06 ,10, 11, 12, 13, 14, 15, 48,     *      CMT27790
                    2776  *        50.                                                     *      CMT27800
                    2777  *                                                                *      CMT27810
                    2778  * ****************************************************************      CMT27920
                    2779  *                                                                       CMT27830
255A  4850 1834     2780  TEST6   LH    R5,DEVICE+6       800 BPI MAG. TAPE?                    CMT27840
255E  2139          2781          BNZS  NOTEST            NO - ABORT TEST                       CMT27850
2560  4850 184C     2782          LH    R5,TRACK+6                                              CMT27860
2564  C550 0009     2783          CLHI  R5,9              9 TRACK TAPE ?                        CMT27870
2568  2134          2784          BNES  NOTEST            NO - ABORT TEST                       CMT27880
256A  4850 18E8     2785          LH    R5,SCRC+6         CRC OPTION SET ?                      CMT27890
```

TEST 6 CYCLIC REDUNDUNCY CHECK

```
256E  2136       2786          BNZS  CRCTST          NO - ABORT TEST                    CMT27900
2570  245F       2787  NOTEST  LIS   R5,15                                              CMT27910
2572  4050 1700  2788          STH   R5,NOERR                                           CMT27920
2576  4300 0E60  2789          B     TSTEND                                             CMT27930
257A  C840 2656  2790  CRCTST  LHI   R4,TEST63         STARTING ADDRESS SET UP FOR        CMT27940
257E  41F0 2B7E  2791          BAL   R14,TSTSUP         SECOND DEVICE TEST                 CMT27950
2582  C850 0005  2792  TEST61  LHI   R5,X'0005'        CHANGE MASK FOR CRCC=0 TEST        CMT27960
2586  4050 3464  2793          STH   R5,MASK                                            CMT27970
258A  41E0 2B36  2794          BAL   R14,TSTINIT        TEST INITIALIZE                    CMT27980
258E  41E0 2F0E  2795          BAL   R14,RESET          SET BUFFER LIMITS                  CMT27990
2592  D0F0 3628  2796          STM   R15,RSAV32                                         CMT28000
2596  D1F0 3624  2797          LM    R15,RLIM+4                                         CMT28010
259A  26F2       2798          AIS   R15,2                                              CMT28020
259C  D0F0 3624  2799          STM   R15,RLIM+4                                         CMT28030
25A0  D1F0 3628  2800          LM    R15,RSAV32                                         CMT28040
25A4  41E0 33FC  2801          BAL   RET,REWIND         REWIND TAPE                        CMT28050
25A8  41E0 2BB8  2802          BAL   R14,FSTEOF         WRITE & CHECK EOF                  CMT28060
25AC  D010 3F88  2803          STM   R1,RSAVE1                                          CMT28070
25B0  2480       2804          LIS   R8,0                                               CMT28080
25B2  2491       2805          LIS   R9,1                                               CMT28090
25B4  24A4       2806          LIS   R10,4              5 BYTES PER RECORD                 CMT28100
25B6  C850 00D7  2807          LHI   R5,X'00D7'         RECORD WITH ODD NUM BYTES OF       CMT28110
25BA  D1F0 3618  2808  FILLWBUF LM    R15,WLIM          X'D7' HAS A CRCC = 0               CMT28120
25BE  0AF8       2809          AHR   R15,R8                                             CMT28130
25C0  D25F 0000  2810          STB   R5,0(R15)                                          CMT28140
25C4  41F0 126A  2811          BAL   R15,TSTBRK         CHECK BREAK KEY                    CMT28150
25C8  C180 25BA  2812          BXLE  R8,FILLWBUF                                        CMT28160
25CC  D110 3F88  2813          LM    R1,RSAVE1                                          CMT28170
25D0  C8A0 0001  2814          LHI   R10,1              NUM RECORDS = 1                    CMT28180
25D4  2491       2815          LIS   R9,1                                               CMT28190
25D6  2481       2816          LIS   R8,1                                               CMT28200
25D8  41C0 2C3A  2817          BAL   R12,WRTREC         WRITE A RECORD                     CMT28210
25DC  4300 2776  2818          B     WRTER6                                             CMT28220
25E0  41D0 31BE  2819          BAL   R13,WAIT2          WAIT FOR MMTN=1                    CMT28230
25E4  DE60 348B  2820          OC    DEV,WEOF           WRITE EOF                          CMT28240
25E8  41E0 33FC  2821          BAL   RET,REWIND         REWIND TAPE                        CMT28250
25EC  DE60 3484  2822          OC    DEV,READ           READ PAST EOF                      CMT28260
25F0  41E0 2FE8  2823          BAL   R14,SENSO2         EOF?                               CMT28270
25F4  4300 2B96  2824          B     CHKEND1            NO - ABORT TEST                    CMT28280
25F8  4830 3466  2825          LH    R3,NBYTE           YES                                CMT28290
25FC  0788       2826          XHR   R8,R8                                              CMT28300
25FE  41C0 2CF4  2827          BAL   R12,RDREC          READ A RECORD                      CMT28310
2602  4200 0000  2828          NOP                                                      CMT28320
2606  9D65       2829          SSR   DEV,STAT                                           CMT28330
2608  4210 32A0  2830          BTC   1,MTDU             DU?                                CMT28340
260C  C350 0080  2831          THI   STAT,X'80'         ERR BIT SET?                       CMT28350
2610  4230 2638  2832          BNZ   CRCZER             YES                                CMT28360
2614  41F0 33FC  2833  SECDEV  BAL   RET,REWIND         REWIND TAPE                        CMT28370
2618  4850 3474  2834          LH    R5,DEV2            SECOND DEVICE FLAG SET?            CMT28380
261C  4230 2644  2835          BNZ   TEST62             YES - GO TO 2ND PART OF TEST       CMT28390
2620  4060 3478  2836          STH   DEV,DEVONE         SAVE 1ST DEVICE ADDRESS            CMT28400
2624  4860 1810  2837          LH    DEV,DV2ADR+6       GET 2ND DEVICE ADDRESS             CMT28410
2628  4330 2644  2838          BZ    TEST62             ZERO - GOTO 2ND PART OF TEST       CMT28420
```

TEST 6 CYCLIC REDUNDUNCY CHECK

```
262C 4060 3474          2839           STH   DEV,DEV2          SET 2ND DEVICE FLAG                  CMT28430
2630 4060 16D0          2840           STH   DEV,ERRDEV                                             CMT28440
2634 4300 2582          2841           B     TEST61            REPEAT CRCC=0 TEST ON 2ND DEV        CMT28450
2638 C800 3531          2842 CRCZER    LHI   R0,C'51'          ERROR 51                             CMT28460
263C 41F0 0F82          2843           BAL   R15,ERRDS                                            CMT28470
2640 4300 2614          2844           B     SECDEV                                               CMT28480
2644 4800 3478          2845 TEST62    LH    R0,DEVONE         ARE 2 DEVICES BEING TESTED?          CMT28490
2648 4330 2656          2846           BZ    TEST63            NO                                   CMT28500
264C 4060 1810          2847           STH   DEV,DV2ADR+6      YES - SAVE 2ND DEV ADDRESS           CMT28510
2650 0860               2848           LHR   DEV,R0            RESTORE 1ST DEV ADDRESS              CMT28520
2652 4060 16D0          2849           STH   DEV,ERRDEV                                           CMT28530
2656 C850 FFFF          2850 TEST63    LHI   R5,X'FFFF'        RESTORE MASK FOR REST OF TEST        CMT28540
265A 4050 3464          2851           STH   R5,MASK                                              CMT28550
265E 41E0 2B36          2852           BAL   R14,TSTINIT       TEST INITIALIZE                      CMT28560
2662 41E0 2F0E          2853           BAL   R14,RESET         SET BUFFER LIMITS                    CMT28570
2666 D0F0 3628          2854           STM   R15,RSAV32                                           CMT28580
266A D1F0 3624          2855           LM    R15,RLIM+4                                           CMT28590
266E 26F2               2856           AIS   R15,2                                                CMT28600
2670 D0F0 3624          2857           STM   R15,RLIM+4                                           CMT28610
2674 D1F0 3628          2858           LM    R15,RSAV32                                           CMT28620
2678 4850 18F4          2859           LH    R5,RDCRC+6        READ CRC ONLY ?                      CMT28630
267C 4230 26C2          2860           BNZ   RCONLY                                               CMT28640
2680 41E0 33FC          2861           BAL   RET,REWIND        REWIND TAPE                          CMT28650
2684 41E0 2BB8          2862           BAL   R14,FSTEOF        WRITE & CHECK EOF                    CMT28660
2688 41E0 2F38          2863           BAL   R14,BSET          SET WRITE BUFFER                     CMT28670
268C 48A0 1858          2864           LH    R10,RECFIL+6      SET NUMBER OF RECORDS                CMT28680
2690 2491               2865           LIS   R9,1                                                 CMT28690
2692 2481               2866           LIS   R8,1                                                 CMT28700
2694 41C0 2C3A          2867 GENFIL6   BAL   R12,WRTREC        WRITE A RECORD                       CMT28710
2698 4300 2776          2868           B     WRTER6                                               CMT28720
269C 0755               2869           XHR   R5,R5                                                CMT28730
269E 4050 3470          2870           STH   R5,RTYCNT                                            CMT28740
26A2 41F0 2C0A          2871 PROC61    BAL   R14,SWAP          REVERSE WRITE BUFFER                 CMT28750
26A6 C180 2694          2872           BXLE  R8,GENFIL6                                           CMT28760
26AA 41D0 31BE          2873 ENDFIL    BAL   R13,WAIT2         WAIT FOR NMIN =1                     CMT28770
26AE DE60 348B          2874           OC    DEV,WEOF          WRITE EOF                            CMT28780
26B2 C850 3512          2875           LHI   R5,MSG05          PRINT MESSAGE TO ADD                 CMT28790
26B6 41F0 112A          2876           BAL   R15,PRINT         CAPACITOR ON CONTROLLER              CMT28800
26BA C850 080F          2877           LHI   R5,X'080F'                                           CMT28810
26BE 9154               2878           SLHLS R5,4                                                 CMT28820
26C0 9505               2879           EPSR  R0,R5             HALT PROCESSOR                       CMT28830
26C2 41E0 33FC          2880 RCONLY    BAL   RET,REWIND        REWIND TAPE                          CMT28840
26C6 DE60 3486          2881           OC    DEV,SKIPF         READ PAST EOF                        CMT28850
26CA 41E0 2FE8          2882           BAL   R14,SENS02                                           CMT28860
26CE 4300 2B96          2883           B     CHKEND1           NO EOF - ABORT TEST                  CMT28870
26D2 4830 3466          2884           LH    R3,NBYTE                                             CMT28880
26D6 0788               2885           XHR   R8,R8                                                CMT28890
26D8 41C0 2CF4          2886 RDFIL6    BAL   R12,RDREC         READ A RECORD                        CMT28900
26DC 4300 2798          2887           B     RDER6                                                CMT28910
26E0 D080 3F88          2888 PROC62    STM   R8,RSAVE1                                           CMT28920
26E4 D1F0 3620          2889 HB1       LM    R15,RLIM                                             CMT28930
26E8 0AF3               2890           AHR   R15,R3                                               CMT28940
26EA 26F1               2891           AIS   R15,1                                                CMT28950
```

TEST 6 CYCLIC REDUNDUNCY CHECK

```
26EC  484F 0000  2892          LH    CHAR,0(R15)                                CMT28960
26F0  D180 3F88  2893          LM    R8,RSAVE1                                  CMT28970
26F4  2305       2894          BS    HY4                                        CMT28980
26F6  D180 3F88  2895  HX4     LM    R8,RSAVE1                                  CMT28990
26FA  4843 3A3B  2896          LH    CHAR,RBUFF+1(R3)                           CMT29000
26FE  4850 347A  2897  HY4     LH    R5,CRCC          GET EXPECTED CRC CHAR     CMT29010
2702  0545       2898          CLHR  CHAR,R5          COMPARE                   CMT29020
2704  4230 274C  2899          BNE   CRCERR                                     CMT29030
2708  C580 0002  2900          CLHI  R8,2             EQUAL -                   CMT29040
270C  238B       2901          BNLS  NOPRINT                                    CMT29050
270E  C820 353D  2902          LHI   R2,MSG06+11      PRINT FIRST TWO CRC CHARS. CMT29060
2712  2404       2903          LIS   R0,4                                       CMT29070
2714  0814       2904          LHR   R1,CHAR                                    CMT29080
2716  41F0 1102  2905          BAL   R15,HEXASC       CONVERT TO ASCII CODE     CMT29090
271A  C850 3532  2906          LHI   R5,MSG06                                   CMT29100
271E  41F0 112A  2907          BAL   R15,PRINT                                  CMT29110
2722  4850 347C  2908  NOPRINT LH    R5,CRCCS         SET OTHER CRC CHAR        CMT29120
2726  9455       2909          EXBR  R5,R5            REVERSE CRC CHARS         CMT29130
2728  D250 347A  2910          STB   R5,CRCC                                    CMT29140
272C  D250 347B  2911          STB   R5,CRCC+1                                  CMT29150
2730  4050 347C  2912          STH   R5,CRCCS                                   CMT29160
2734  C180 26D8  2913          BXLE  R8,RDFIL6        GO TO READ NEXT RECORD    CMT29170
2738  C850 2929  2914  ENDTST6 LHI   R5,X'2929'       RESTORE ORIGINAL CRC CHAR CMT29180
273C  4050 347A  2915          STH   R5,CRCC                                    CMT29190
2740  C850 6A29  2916          LHI   R5,X'6A29'                                 CMT29200
2744  4050 347C  2917          STH   R5,CRCCS                                   CMT29210
2748  4300 2B96  2918          B     CHKEND1                                    CMT29220
                 2919  *                                                       CMT29230
                 2920  *       CRC ERROR                                       CMT29240
                 2921  *                                                       CMT29250
274C  C820 3556  2922  CRCERR  LHI   R2,MSG07+18      CRC NOT EQUAL             CMT29260
2750  2404       2923          LIS   R0,4                                       CMT29270
2752  0815       2924          LHR   R1,R5                                      CMT29280
2754  41F0 1102  2925          BAL   R15,HEXASC       PRINT BOTH CRC CHARS.     CMT29290
2758  C820 3563  2926          LHI   R2,MSG07+31                                CMT29300
275C  0814       2927          LHR   R1,CHAR                                    CMT29310
275E  41F0 1102  2928          BAL   R15,HEXASC                                 CMT29320
2762  C800 3438  2929          LHI   R0,C'48'         ERROR 48                  CMT29330
2766  41F0 0F6A  2930          BAL   R15,ERRD                                   CMT29340
276A  C850 3544  2931          LHI   R5,MSG07                                   CMT29350
276E  41D0 3186  2932          BAL   R13,MSGPRT                                 CMT29360
2772  4300 2722  2933          B     NOPRINT                                    CMT29370
2776  48F0 346A  2934  WRTER6  LH    R15,EOTFLG        EOT ?                     CMT29380
277A  2337       2935          BZS   RCOVR6                                     CMT29390
277C  41D0 31BE  2936          BAL   R13,WAIT2         YES -                     CMT29400
2780  DE60 3483  2937          OC    DEV,BKSPAC        BACKSPACE AND             CMT29410
2784  4300 26AA  2938          B     ENDFIL            CLOSE UP FILE             CMT29420
2788  41F0 0F82  2939  RCOVR6  BAL   R15,ERRDS                                   CMT29430
278C  41E0 304A  2940          BAL   R14,RETRY         RETRY 5 TIMES             CMT29440
2790  4300 2694  2941          B     GENFIL6                                    CMT29450
2794  4300 26A2  2942          B     PROC61                                     CMT29460
2798  9D65       2943  RDER6   SSR   DEV,STAT                                   CMT29470
279A  C350 0060  2944          THI   STAT,X'60'        EOF OR EOT?               CMT29480
```

TEST 6 CYCLIC REDUNDUNCY CHECK

```
279E   4230 2738          2945          BNZ   ENDTST6          YES - END OF FILE          CMT29490
27A2   41F0 0F82          2946          BAL   R15,ERRDS                                  CMT29500
27A6   4300 25E0          2947          B     PROC62                                    CMT29510
```

TEST 7 UTILITY TEST

```
2949  * ************************************************************* CMT29530
2950  *                                                               * CMT29540
2951  *                          T E S T 7                            * CMT29550
2952  *                                                               * CMT29560
2953  *    PURPOSE:                                                   * CMT29570
2954  *        A UTILITY TEST TO ALLOW USER TO TEST THE DEVICE        * CMT29580
2955  *        IN HIS OWN CHOSEN METHOD. OPTIONS ARE PROVIDED        * CMT29590
2956  *        TO SELECT THE INDIVIDUAL FUNCTIONS AS SPECIFIED       * CMT29600
2957  *        IN APPENDIX 6 OF PUBLICATION 06-172A15. A SCOPE       * CMT29610
2958  *        LOOP OPTION IS ALSO PROVIDED.                         * CMT29620
2959  *                                                              * CMT29630
2960  *        THE RECORD SIZE IN THIS TEST CAN BE VARIED BY THE     * CMT29640
2961  *        OPTION BYTES. THE LIMITS ARE FROM 2 TO X'400'. IF     * CMT29650
2962  *        THE USER WISHES TO INCREASE THE UPPER LIMIT, HE MAY   * CMT29660
2963  *        DO SO BY INCREASING THE CONTENT OF LOCATION LABELLED  * CMT29670
2964  *        "X400". IT MUST BE NOTED THAT THE LOWER LIMIT         * CMT29680
2965  *        CANNOT BE LESS THAN 2 AND THE HIGHER LIMIT MUST       * CMT29690
2966  *        NOT BE CHANGED TO A VALUE HIGHER THAN X'7FFF'.        * CMT29700
2967  *                                                              * CMT29710
2968  *    ASSUMPTIONS:                                              * CMT29720
2969  *        SAME AS IN TEST 0.                                    * CMT29730
2970  *                                                              * CMT29740
2971  *    DESIGN SPECIFICATION:                                     * CMT29750
2972  *        SEVERAL OPTIONS ARE PROVIDED TO THE USER TO SELECT    * CMT29760
2973  *        THE DESIRED FUNCTIONS. THE SCOPE LOOP FUNCTIONS       * CMT29770
2974  *        SUPERCEDE ALL OTHER FUNCTIONS. IF SCOPE=0, THEN       * CMT29780
2975  *        READ ONLY HAS HIGHEST PRIORITY, FOLLOWED BY WRITE     * CMT29790
2976  *        EOF CONTINUOUS. SCOPE LOOP IS EXECUTED CONTINUOUSLY   * CMT29800
2977  *        WITHOUT ANY ERROR CHECKING. SCOPE 1, 2 & 3 INVOLVES   * CMT29810
2978  *        WRITE OPERATION, AND ENSURES PROPER TERMINATION       * CMT29820
2979  *        BY WRITING AN EOF. ALL SCOPES CAN BE STOPPED BY       * CMT29830
2980  *        BREAK OR DU. SCOPE 5 WILL SKIP FORWARD UNTIL EOT      * CMT29840
2981  *        AND THEN SKIP REVERSE TILL BOT. THIS WILL CONTINUE    * CMT29850
2982  *        UNTIL STOPPED BY THE USER.                            * CMT29860
2983  *        WHEN SCOPE=0 THE DEFAULT OPTIONS WILL GENERATE A      * CMT29870
2984  *        FILE. BACKSPACE OVER IT AND READ IT. THE BUFFERS      * CMT29880
2985  *        ARE COMPARED. IF BACKSPACE IS NOT SPECIFIED, A SKIP   * CMT29890
2986  *        FILE REVERSE IS PERFORMED BEFORE READING. MORE THAN   * CMT29900
2987  *        ONE FILES CAN BE SPECIFIED BY OPTION FILES.           * CMT29910
2988  *        THE WEOF CONTINUOUS OPERATION IS PERFORMED IN THIS     * CMT29920
2989  *        TEST WITH NO ERROR CHECKING.                          * CMT29930
2990  *                                                              CMT29940
2991  *        SEVERAL SIMPLE SUBROUTINES ARE IMPLEMENTED TO         * CMT29950
2992  *        PERFORM DIFFERENT TAPE FUNCTIONS. NO ERROR CHECK      * CMT29960
2993  *        IS DONE. THIS ALLOWS THE USER TO WRITE SHORT          * CMT29970
2994  *        UTILITY PROGRAMS:                                     * CMT29980
2995  *        BAL   R14,EOF          WRITE EOF MARK                 * CMT29990
2996  *        BAL   R14,RWND         REWIND TAPE                    * CMT30000
2997  *        BAL   R14,SKFW         SKIP EOF FORWARD               * CMT30010
2998  *        BAL   R14,SKRV         SKIP EOF REVERSE               * CMT30020
2999  *        BAL   R14,BKSP         BACKSPACE RECORD               * CMT30030
3000  *        BAL   R14,WRTBLK       WRITE RECORD BLOCK MODE        * CMT30040
3001  *        BAL   R14,RDBLK        READ RECORD BLOCK MODE         * CMT30050
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                                3002  *        BAL   R14,RWSEL           READ OR WRITE REC SELCH MODE  *   CMT30060
                                3003  *        NOTE: ALL READ/WRITE RECORD ROUTINES ASSUME THAT      *   CMT30070
                                3004  *              R11 CONTAINS THE STARTING ADDRESS, AND R12      *   CMT30080
                                3005  *              CONTAINS THE ENDING ADDRESS OF THE RECORD.      *   CMT30090
                                3006  *              ALSO, RWSEL ASSUMES THAT R2 CONTAINS THE       *   CMT30100
                                3007  *              DEVICE COMMAND AND R3 CONTAINS THE SELCH       *   CMT30110
                                3008  *              GO AND COMMAND.                                *   CMT30120
                                3009  *                                                             *   CMT30130
                                3010  *    HOW TO RUN THE TEST:                                     *   CMT30140
                                3011  *        REFER TO TEST 0. SELECT THE APPROPRIATE OPTION      *   CMT30150
                                3012  *        AND RUN TEST 7.                                    *   CMT30160
                                3013  *                                                           *   CMT30170
                                3014  *    OPTIONS:                                               *   CMT30180
                                3015  *        TEST, LOOP, CONTIN, NOMSG, DEVADR, DV2ADR, SELCH,  *   CMT30190
                                3016  *        INTLEV, MODE, TRACK, RECFIL, FILES, WRITE, READ,   *   CMT30200
                                3017  *        BKSPAC, WEOF, BYTES, SCOPE.                        *   CMT30210
                                3018  *        WSTART,RSTART                                      *   CMT30220
                                3019  *                                                           *   CMT30230
                                3020  *    ERRORS:                                                *   CMT30240
                                3021  *        00, 01, 02, 04, 05, 08, 10, 11, 12, 13, 14, 15, 46,*   CMT30250
                                3022  *        47, 50.                                            *   CMT30260
                                3023  *                                                           *   CMT30270
                                3024  * ***********************************************************   CMT30280
                                3025  *                                                               CMT30290
27AA  C840 27B2                 3026  TEST7    LHI   R4,TEST71          STARTING ADDRESS SET UP FOR   CMT30300
27AE  41E0 2B7E                 3027           BAL   R14,TSTSUP         SECOND DEVICE TEST            CMT30310
27B2  41E0 2B36                 3028  TEST71   BAL   R14,TSTINIT        TEST INITIALIZE               CMT30320
27B6  41D0 324C                 3029           BAL   R13,WAIT1          WAIT FOR NMIN=1               CMT30330
27BA  48A0 1864                 3030           LH    R10,NOBYTE+6       GET NO. BYTES PER RECORD      CMT30340
27BE  27A1                      3031           SIS   R10,1              REDUCE BY 1                   CMT30350
27C0  40A0 3466                 3032           STH   R10,NBYTE                                        CMT30360
27C4  2421                      3033           LIS   R2,1                                             CMT30370
27C6  4830 1858                 3034           LH    R3,RECFIL+6        GET RECORD PER FILE           CMT30380
27CA  41E0 2F0E                 3035           BAL   R14,RESET          RESET BUFFER LIMITS           CMT30390
27CE  48E0 3468                 3036           LH    R14,DE                                           CMT30400
27D2  C5E0 000F                 3037           CLHI  R14,X'F'                                         CMT30410
27D6  2333                      3038           BES   NXTMOD7                                          CMT30420
27D8  41E0 2F38                 3039           BAL   R14,BSET           SET WRITE BUFFER 00-FF        CMT30430
27DC  41E0 33FC                 3040  NXTMOD7  PAL   RET,REWIND         REWIND TAPE                   CMT30440
27E0  4850 1918                 3041           LH    R5,SCOPE+6         SCOPE LOOP?                   CMT30450
27E4  4230 28FA                 3042           BNZ   SCLJOP             YES - GO TO SCOPE LOOP        CMT30460
27E8  0788                      3043           XHR   R8,R8              NO - RESET FILE COUNTER       CMT30470
27EA  4850 18AC                 3044           LH    R5,OPWRT+6         WRITE OPTION?                 CMT30480
27EE  2135                      3045           BNZS  CHKEOF             YES - CHECK WEOF OPTION       CMT30490
27F0  4850 18A0                 3046           LH    R5,OPRD+6          NO - READ OPTION?             CMT30500
27F4  4230 284C                 3047           BNZ   RONLY7             YES - READ ONLY               CMT30510
27F8  4850 18D0                 3048  CHKEOF   LH    R5,OPWEOF+6        WRITE EOF TO SUPERCEDE WRITE? CMT30520
27FC  4230 2A70                 3049           BNZ   CONEOF            YES - WRITE EOF CONTINUOUSLY  CMT30530
2800  41E0 307E                 3050           BAL   R14,INDATA         NO - ACQUIRE DATA STRING      CMT30540
2804  41D0 31BE                 3051           BAL   R13,WAIT2          WAIT FOR NMIN=1               CMT30550
2808  41E0 2BB8                 3052           BAL   R14,FSTEOF         WRITE & CHECK EOF             CMT30560
280C  2411                      3053  WRTFIL   LIS   R1,1                                             CMT30570
280E  41C0 2C3A                 3054  GENFIL7  BAL   R12,WRTREC         WRITE A RECORD                CMT30580
```

TEST 7 UTILITY TEST

```
2812  4300 28BA          3055           B      WRTER71                                    CMT30590
2816  C110 280E          3056  WCON7    BXLE   R1,GENFIL7       CONTINUE FOR A FILE       CMT30600
281A  41D0 31BE          3057           BAL    R13,WAIT2                                  CMT30610
281E  DE60 348B          3058           OC     DEV,WEOF                                   CMT30620
2822  4850 18B8          3059           LH     R5,OPBSP+6       BACKSPACE OPTION?         CMT30630
2826  4330 289E          3060           BZ     NOBSP7           NO - SKIP BACK IF TO READ CMT30640
282A  41D0 31BE          3061           BAL    R13,WAIT2                                  CMT30650
282E  DE60 3483          3062           OC     DEV,BKSPAC       BACKSPACE OVER EOF        CMT30660
2832  2411               3063           LIS    R1,1                                       CMT30670
2834  41E0 2BEC          3064  BSFIL7   BAL    R14,BSPACE       BACKSPACE A RECORD        CMT30680
2838  C110 2834          3065           BXLE   R1,BSFIL7        CONTINUE FOR A FILE       CMT30690
283C  4850 19A0          3066           LH     R5,OPRD+6        READ OPTION?              CMT30700
2840  4330 287E          3067           BZ     ENDFIL7          NO - CHECK FOR MORE FILES CMT30710
2844  41D0 31BE          3068           BAL    R13,WAIT2                                  CMT30720
2848  DE60 3483          3069           OC     DEV,BKSPAC       BACKSPACE OVER LEADING EOF CMT30730
284C  41D0 31BE          3070  RONLY7   BAL    R13,WAIT2        YES -                     CMT30740
2850  DE60 3484          3071           OC     DEV,READ         READ PASS EOF             CMT30750
2854  2411               3072  RDFIL7   LIS    R1,1                                       CMT30760
2856  41C0 2CF4          3073  RERDR7   BAL    R12,RDREC        READ A RECORD             CMT30770
285A  4300 28DC          3074           B      RDER71                                     CMT30780
285E  4850 18DC          3075           LH     R5,CMPRE+6       COMPARE?                  CMT30790
2862  2333               3076           BZS    NOCOM                                      CMT30800
2864  41E0 2E34          3077           BAL    R14,COMPAR       YES - COMPARE DATA        CMT30810
2868  4850 1900          3078  NOCOM    LH     R5,SDUMP+6       DUMP?                     CMT30820
286C  2333               3079           BZS    RDON                                       CMT30830
286E  41E0 2F90          3080           BAL    R14,DUMP         YES - DUMP READ BUFFER    CMT30840
2872  C110 2856          3081  RDON     BXLE   R1,RERDR7        CONTINUE FOR A FILE       CMT30850
2876  41D0 31BE          3082           BAL    R13,WAIT2        WAIT FOR NMTN=1           CMT30860
287A  DE60 3484          3083           OC     DEV,READ         READ PASS EOF             CMT30870
287E  2681               3084  ENDFIL7  AIS    R8,1                                       CMT30880
2880  4580 1870          3085           CLH    R8,FILES+6       ALL FILES WRITTEN/READ?   CMT30890
2884  2387               3086           BNLS   END7                                       CMT30900
2886  4850 18AC          3087           LH     R5,OPWRT+6       NO - WRITE?               CMT30910
288A  4230 280C          3088           BNZ    WRTFIL           YES - WRITE NEXT FILE     CMT30920
288E  4300 2854          3089           B      RDFIL7                                     CMT30930
2892  41E0 33FC          3090  END7     BAL    RET,REWIND       REWIND TAPE               CMT30940
2896  41D0 3026          3091           BAL    R13,TSTMOD                                 CMT30950
289A  4300 27DC          3092           B      NXTMOD7                                    CMT30960
289E  4850 18A0          3093  NOBSP7   LH     R5,OPRD+6        READ OPTION SET?          CMT30970
28A2  4330 287E          3094           BZ     ENDFIL7          NO - CHECK FOR MORE FILES CMT30980
28A6  41D0 31BE          3095           BAL    R13,WAIT2                                  CMT30990
28AA  DE60 3487          3096           OC     DEV,SKIPR        YES - SKIP BACK OVER EOF  CMT31000
28AE  41D0 31BE          3097           BAL    R13,WAIT2        WAIT FOR NMTN=1           CMT31010
28B2  DF60 3487          3098           OC     DEV,SKIPR        SKIP REVERSE ONE FILE     CMT31020
28B6  4300 284C          3099           B      RONLY7           GO TO READ                CMT31030
                         3100  *                                                          CMT31040
                         3101  *        ERROR PROCEDURE                                   CMT31050
                         3102  *                                                          CMT31060
28BA  48E0 346A          3103  WRTER71  LH     R14,EOTFLG       EOT?                      CMT31070
28BE  2135               3104           BNZS   WEOT7                                      CMT31080
28C0  41E0 300E          3105           BAL    R14,ERRMSG2      NO - PRINT ERROR MESSAGE  CMT31090
28C4  4300 2816          3106           B      WCON7                                      CMT31100
28C8  41D0 31BE          3107  WEOT7    BAL    R13,WAIT2                                  CMT31110
```

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28CC  DE60 3483  3108          OC    DEV,BKSPAC          BACKSPACE A RECORD          CMT31120
28D0  41D0 31BE  3109          BAL   R13,WAIT2                                       CMT31130
28D4  DE60 348B  3110          OC    DEV,WEOF            WRITE EOF                   CMT31140
28D8  4300 2892  3111          B     END7                                            CMT31150
28DC  9D65       3112  RDER71  SSR   DEV,STAT                                        CMT31160
28DE  C350 0040  3113          THI   STAT,X'40'                                      CMT31170
28E2  4230 287E  3114          BNZ   ENDFIL7                                         CMT31180
28E6  C350 0020  3115          THI   STAT,X'20'          EOT?                        CMT31190
28EA  4230 2892  3116          BNZ   END7                                            CMT31200
28EE  41E0 300E  3117          BAL   R14,ERRMSG2                                     CMT31210
28F2  4300 2868  3118          B     NOCOM                                           CMT31220
28F6  4300 1498  3119  SLCHINT B     RETOPSW                                         CMT31230
                 3120  *                                                           CMT31240
                 3121  *       SCOPE LOOPS: NO ERROR CHECK                         CMT31250
                 3122  *                                                           CMT31260
28FA  C550 0005  3123  SCLOOP  CLHI  R5,5                                          CMT31270
28FE  4330 2A92  3124          BE    SKPCON                                          CMT31280
2902  C550 0004  3125          CLHI  R5,4                                            CMT31290
2906  4380 29E8  3126          BNL   RDCON                                           CMT31300
290A  41E0 307E  3127          BAL   R14,INDATA          YES - GET DATA PATTERN      CMT31310
290E  4850 1918  3128          LH    R5,SCOPE+6                                      CMT31320
2912  2751       3129          SIS   R5,1                                            CMT31330
2914  0A55       3130          AHR   R5,R5                                           CMT31340
2916  4800 346E  3131          LH    R0,MODFLG                                       CMT31350
291A  C500 0001  3132          CLHI  R0,1                BLOCK MODE?                 CMT31360
291E  2332       3133          BES   BLKMOD                                          CMT31370
2920  2651       3134          AIS   R5,1                                            CMT31380
2922  D3A5 34B6  3135  BLKMOD  LB    R10,SQMASK(R5)                                  CMT31390
2926  C840 2AFC  3136          LHI   R4,LOOPBRK                                      CMT31400
292A  4040 16FA  3137          STH   R4,KBINT                                        CMT31410
292E  41F0 132E  3138          BAL   R15,KBRD            SET KEYBOARD INTERRUPT      CMT31420
2932  C850 28F6  3139          LHI   R5,SLCHINT                                      CMT31430
2936  4050 196A  3140          STH   R5,DEVINT                                       CMT31440
293A  4840 0A22  3141          LH    R4,PSW              ENABLE PSW INTERRUPT        CMT31450
293E  9554       3142          EPSR  R5,R4                                           CMT31460
2940  41E0 32C2  3143          BAL   R14,EOF                                         CMT31470
2944  088A       3144  ADVANCE LHR   R8,R10                                        CMT31480
                 3145  *       THIS ROUTINE WRITES A FILE WITH LEADING EOF. IF EOT  CMT31490
                 3146  *       IS DETECTED, IT REWINDS TAPE AND WRITES WHOLE FILE   CMT31500
                 3147  *       AGAIN. ROUTINE WFILB USES THE WB MODE AND ROUTINE    CMT31510
                 3148  *       WFILS USES SELCH MODE                               CMT31520
2946  D0F0 3628  3149          STM   R15,RSAV32                                      CMT31530
294A  D1F0 3618  3150          LM    R15,WLIM                                        CMT31540
294E  08BF       3151          LHR   R11,R15                                         CMT31550
2950  D1F0 361C  3152          LM    R15,WLIM+4                                      CMT31560
2954  08CF       3153          LHR   R12,R15                                         CMT31570
2956  D1F0 3628  3154          LM    R15,RSAV32                                      CMT31580
295A  9081       3155  WFILB   SRLS  R8,1                SHIFT SEQUENCE MASK         CMT31590
295C  4380 2986  3156          BNC   WFILS               NO CARRY - BYPASS           CMT31600
2960  41E0 32E4  3157          BAL   R14,WRTBLK           WRITE A RECORD (BLOCK MODE) CMT31610
2964  9D65       3158          SSR   DEV,STAT                                        CMT31620
2966  2221       3159          BFBS  2,1                                             CMT31630
2968  C350 0020  3160          THI   STAT,X'20'          EOT?                        CMT31640
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296C  233D           3161          BZS   WFILS              NO - GO ON                                CMT31650
296E  41E0 32FC      3162  EOT7    BAL   R14,BKSP           YES - BACKSPACE THE LAST RECORD           CMT31660
2972  41E0 32C2      3163          BAL   R14,EOF            WRITE EOF                                 CMT31670
2976  41E0 32CC      3164  PREOT   BAL   R14,RWND           REWIND                                    CMT31680
297A  C850 3506      3165          LHI   R5,MSG04           EXIT TEST                                 CMT31690
297E  41F0 112A      3166          BAL   R15,PRINT                                                    CMT31700
2982  4300 2B9A      3167          B     CHKEND                                                       CMT31710
2986  9081           3168  WFILS   SRLS  R8,1               SHIFT SEQUENCE MASK                       CMT31720
2988  4380 29AC      3169          BNC   BSFIL              NO CARRY - BYPASS                         CMT31730
298C  D320 3485      3170          LB    R2,WRITE           DEVICE WRITE COMMAND                      CMT31740
2990  D330 3480      3171          LB    R3,GOWRT           SELCH WRITE COMMAND                       CMT31750
2994  4810 0A24      3172          LH    R1,PSW2            DISABLE INTERRUPTS AT                     CMT31760
2998  9541           3173          EPSR  R4,R1              PROCESSOR LEVEL                           CMT31770
299A  41E0 3306      3174          BAL   R14,RWSEL          WRITE A RECORD (SELCH MODE)               CMT31780
299E  9514           3175          EPSR  R1,R4              RESTORE PSW                               CMT31790
29A0  9D65           3176          SSR   DEV,STAT                                                     CMT31800
29A2  2221           3177          BFBS  2,1                                                          CMT31810
29A4  C350 0020      3178          THI   STAT,X'20'         EOT?                                      CMT31820
29A8  4230 296E      3179          BNZ   EOT7                                                         CMT31830
                     3180  *       THIS ROUTINE BACKSPACE A FILE BEYOND ITS LEADING                   CMT31840
                     3181  *       EOF MARK                                                           CMT31850
29AC  9081           3182  BSFIL   SRLS  R8,1               SHIFT SEQUENCE MASK                       CMT31860
29AE  4380 2944      3183          BNC   ADVANCE            NO CARRY - BYPASS                         CMT31870
29B2  41E0 32FC      3184          BAL   R14,BKSP           BACKSPACE A RECORD                        CMT31880
                     3185  *       THIS ROUTINE READS A FILE WITH LEADING EOF. IF EOT                 CMT31890
                     3186  *       IS DETECTED, IT REWINDS AND READS AGAIN                            CMT31900
                     3187  *       ROUTINE RFILB USES RB MODE AND RFILS USES SELCH MODE               CMT31910
                     3188  *                                                                          CMT31920
29B6  D0F0 3628      3189  RFILB   STM   R15,RSAV32                                                   CMT31930
29BA  D1F0 3620      3190          LM    R15,RLIM                                                     CMT31940
29BE  08BF           3191          LHR   R11,R15                                                      CMT31950
29C0  D1F0 3624      3192          LM    R15,RLIM+4                                                   CMT31960
29C4  08CF           3193          LHR   R12,R15                                                      CMT31970
29C6  D1F0 3628      3194          LM    R15,RSAV32                                                   CMT31980
29CA  9081           3195          SRLS  R8,1               SHIFT SEQUENCE MASK                       CMT31990
29CC  2383           3196          BNCS  RFILS              NO CARRY - BYPASS                         CMT32000
29CE  41E0 32F0      3197          BAL   R14,RDBLK          READ A RECORD (BLOCK MODE)                CMT32010
29D2  9081           3198  RFILS   SRLS  R8,1               SHIFT SEQUENCE MASK                       CMT32020
29D4  4380 2944      3199          BNC   ADVANCE            NO CARRY - RESTART CYCLE                  CMT32030
29D8  D320 3484      3200          LB    R2,READ            DEVICE READ COMMAND                       CMT32040
29DC  D330 3481      3201          LB    R3,GORD            SELCH READ COMMAND                        CMT32050
29E0  41E0 3306      3202          BAL   R14,RWSEL          READ A RECORD (SELCH MODE)                CMT32060
29E4  4300 2944      3203          B     ADVANCE            RESTART CYCLE                             CMT32070
                     3204  *                                                                          CMT32080
                     3205  *       READ ONLY SCOPE LOOP                                               CMT32090
                     3206  *       THIS ROUTINE READS RECORDS ON THE TAPE UNTIL AN                     CMT32100
                     3207  *       EOF IS DETECTED. THEN THE TEST WILL PAUSE WITH THE                  CMT32110
                     3208  *       MESSAGE "EOF". IF CR IS ENTERED ON KEYBOARD, THE                   CMT32120
                     3209  *       TEST IS ABORTED. IF LF IS ENTERED, THE TEST READS                  CMT32130
                     3210  *       ON TO THE NEXT EOF. IF EOT IS DETECTED, THE TEST                   CMT32140
                     3211  *       IS ABORTED.                                                        CMT32150
                     3212  *                                                                          CMT32160
29E8  D0F0 3628      3213  RDCON   STM   R15,RSAV32                                                   CMT32170
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29EC D1F0 3620          3214            LM    R15,RLIM                                  CMT32180
29F0 08FF               3215            LHR   R11,R15                                   CMT32190
29F2 D1F0 3624          3216            LM    R15,RLIM+4                                CMT32200
29F6 08CF               3217            LHR   R12,R15                                   CMT32210
29F8 D1F0 3628          3218            LM    R15,RSAV32                                CMT32220
29FC 41D0 32D6          3219            BAL   R13,SENMTN        CHECK FOR NMTN          CMT32230
2A00 DF60 3484          3220            OC    DEV,READ                                  CMT32240
2A04 4850 346E          3221            LH    R5,MODFLG                                 CMT32250
2A08 C550 0002          3222            CLHI  R5,2              MODE 2?                 CMT32260
2A0C 4330 2A48          3223            BE    RDCONS            YES - SELCH MODE        CMT32270
2A10 41E0 32F0          3224  RDCONB    BAL   R14,RDBLK         READ RECORD BLOCK MODE  CMT32280
2A14 9D65               3225            SSR   DEV,STAT                                  CMT32290
2A16 4210 32A0          3226            BTC   1,MTDU                                    CMT32300
2A1A 2223               3227            BFBS  2,3                                       CMT32310
2A1C C350 0020          3228            THI   STAT,X'20'        EOT?                    CMT32320
2A20 4230 2976          3229            BNZ   PREOT             YES - END TEST          CMT32330
2A24 C350 0040          3230            THI   STAT,X'40'        EOF?                    CMT32340
2A28 223C               3231            BZS   RDCONB            NO - CONTINUE           CMT32350
2A2A C850 350C          3232  PAUSE0    LHI   R5,MSG04A                                 CMT32360
2A2E 41F0 112A          3233            BAL   R15,PRINT                                 CMT32370
2A32 41F0 121C          3234  PAUSE1    BAL   R15,GETCHR        GET A CHARACTER         CMT32380
2A36 C540 000D          3235            CLHI  CHAR,X'0D'        CR?                     CMT32390
2A3A 4330 0AE6          3236            BE    OPTIN             YES - EXIT              CMT32400
2A3E C540 000A          3237            CLHI  CHAR,X'0A'        LF?                     CMT32410
2A42 4330 29E8          3238            BE    RDCON             YES - CONTINUE READ     CMT32420
2A46 220A               3239            BS    PAUSE1            ELSE GET ANOTHER CHARACTER CMT32430
2A48 D320 3484          3240  RDCONS    LB    R2,READ           DEVICE READ COMMAND     CMT32440
2A4C D330 3481          3241            LB    R3,GORD           SELCH READ COMMAND      CMT32450
2A50 41E0 3306          3242            BAL   R14,RWSEL         READ RECORD SELCH MODE  CMT32460
2A54 9D65               3243            SSR   DEV,STAT                                  CMT32470
2A56 4210 32A0          3244            BTC   1,MTDU                                    CMT32480
2A5A 2223               3245            BFBS  2,3                                       CMT32490
2A5C C350 0020          3246            THI   STAT,X'20'        EOT?                    CMT32500
2A60 4230 2976          3247            BNZ   PREOT             YES - EXIT              CMT32510
2A64 C350 0040          3248            THI   STAT,X'40'        EOF?                    CMT32520
2A68 4330 2A48          3249            BZ    RDCONS                                    CMT32530
2A6C 4300 2A2A          3250            B     PAUSE0                                    CMT32540
                        3251  *                                                         CMT32550
                        3252  *         WRTIE EOF SCOPE LOOP                            CMT32560
                        3253  *                                                         CMT32570
2A70 41E0 32C2          3254  CONEOF    BAL   R14,EOF           WRITE EOF               CMT32580
2A74 9D65               3255            SSR   DEV,STAT                                  CMT32590
2A76 4210 32A0          3256            BTC   1,MTDU                                    CMT32600
2A7A 2223               3257            BFBS  2,3                                       CMT32610
2A7C C350 0020          3258            THI   STAT,X'20'        EOM?                    CMT32620
2A80 2238               3259            BZS   CONEOF            YES - EOT ?             CMT32630
2A82 41F0 32CC          3260            BAL   R14,RWND                                  CMT32640
2A86 C850 3506          3261            LHI   R5,MSG04          EOT - REWIND TAPE       CMT32650
2A8A 41F0 112A          3262            BAL   R15,PRINT                                 CMT32660
2A8E 4300 0AE6          3263            B     OPTIN                                     CMT32670
                        3264  *         THIS ROUTINE PERFORM SKIP OPERATIONS CONTINUOUSLY CMT32680
                        3265  *         IT REVERSES DIRECTION UPON DETECTION OF ET       CMT32690
2A92 41D0 32D6          3266  SKPCON    BAL   R13,SENMTN                                CMT32700
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TEST 7 UTILITY TEST

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2A96  DE60 3484          3267           OC    DEV,READ          READ PASS FIRST EOF                    CMT32710
2A9A  41E0 33DE          3268  SKPCON1  BAL   R14,SKFW          SKIP FORWARD                           CMT32720
2A9E  9D65               3269           SSR   DEV,STAT                                                 CMT32730
2AA0  4210 32A0          3270           BTC   1,MTDU                                                   CMT32740
2AA4  41E0 126A          3271           BAL   R15,TSTBRK                                               CMT32750
2AA8  C350 0022          3272           THI   STAT,X'22'        EOM OR EOT?                            CMT32760
2AAC  2237               3273           BZS   SKPCON1+4                                                CMT32770
2AAE  C350 0020          3274           THI   STAT,X'20'        EOT?                                   CMT32780
2AB2  223C               3275           BZS   SKPCON1                                                  CMT32790
2AB4  DE60 347F          3276           OC    DEV,CLEAR         YES - CLEAR DEVICE                     CMT32800
2AB8  41E0 33E8          3277  REVRS    BAL   R14,SKRV          SKIP REVERSE                           CMT32810
2ABC  41D0 32D6          3278           BAL   R13,SENMTN        WAIT FOR NMTN=1                        CMT32820
2AC0  9D65               3279           SSR   DEV,STAT                                                 CMT32830
2AC2  4210 32A0          3280           BTC   1,MTDU                                                   CMT32840
2AC6  C350 0020          3281           THI   STAT,X'20'        EOT?                                   CMT32850
2ACA  2239               3282           BZS   REVRS             NO - SKIP REVERSE AGAIN                CMT32860
2ACC  DE60 347F          3283           OC    DEV,CLEAR         YES - CLEAR DEVICE                     CMT32870
2AD0  9D65               3284           SSR   DEV,STAT                                                 CMT32880
2AD2  C350 0020          3285           THI   STAT,X'20'        BOT?                                   CMT32890
2AD6  4230 2A92          3286           BNZ   SKPCON            YES - GO SKIP FORWARD                  CMT32900
2ADA  41E0 33E8          3287  REVRS1   BAL   R14,SKRV          CONTINUE SKIP REVERSE                  CMT32910
2ADE  9D65               3288           SSR   DEV,STAT                                                 CMT32920
2AE0  4210 32A0          3289           BTC   1,MTDU                                                   CMT32930
2AE4  41F0 126A          3290           BAL   R15,TSTBRK                                               CMT32940
2AE8  C350 0022          3291           THI   STAT,X'22'        EOM OR BOT?                            CMT32950
2AEC  2237               3292           BZS   REVRS1+4                                                 CMT32960
2AEE  C350 0020          3293           THI   STAT,X'20'        BOT?                                   CMT32970
2AF2  223C               3294           BZS   REVRS1                                                   CMT32980
2AF4  DE60 347F          3295           OC    DEV,CLEAR                                                CMT32990
2AF8  4300 2A92          3296           B     SKPCON            GO SKIP FORWARD                        CMT33000
                         3297  *                                                                        CMT33010
                         3298  *        THIS SECTION CHECKS IF THE KEYBOARD CHARACTER IS                 CMT33020
                         3299  *        BREAK.                                                          CMT33030
                         3300  *                                                                        CMT33040
2AFC  9B24               3301  LOOPBRK  RDR   R2,R4             GET THE CHARACTER                      CMT33050
2AFE  C440 007F          3302           NHI   R4,X'7F'                                                 CMT33060
2B02  4230 1498          3303           BNZ   RETOPSW           NO - CONTINUE LOOP                     CMT33070
2B06  C840 1492          3304           LHI   R4,NOBRK          YES - RESTORE BRK CHECK ROUTINE        CMT33080
2B0A  4040 16FA          3305           STH   R4,KBINT          IN ETPE                                CMT33090
2B0E  C820 00F0          3306           LHI   R2,X'F0'          RESTORE REG. SET                       CMT33100
2B12  9512               3307           EPSR  R1,R2                                                    CMT33110
2B14  4850 346E          3308           LH    R5,MODFLG                                                CMT33120
2B18  C550 0002          3309           CLHI  R5,2              MODE 2?                                CMT33130
2B1C  2135               3310           BNES  CLRDEV                                                   CMT33140
2B1E  9D75               3311           SSR   SELCH,STAT                                               CMT33150
2B20  2081               3312           BTBS  8,1                                                      CMT33160
2B22  DE70 347E          3313           OC    SELCH,STOP        STOP SELCH                             CMT33170
2B26  DE60 347F          3314  CLRDEV   OC    DEV,CLEAR         CLEAR DEVICE                           CMT33180
2B2A  41E0 32C2          3315           BAL   R14,EOF           WRITE EOF                              CMT33190
2B2E  41E0 32CC          3316           BAL   R14,RWND          REWIND                                 CMT33200
2B32  4300 0AE6          3317           B     OPTIN                                                    CMT33210
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                        * ****************************************************************  CMT33230
                        * SUBROUTINE TSTINIT                                             *  CMT33240
                        *         THIS ROUTINE SETS UP THE TEST MODE AND APPROPRIATE     *  CMT33250
                        *         MEMORY LOCATIONS FOR EACH TEST MODULE.                 *  CMT33260
                        *         CALLING SEQUENCE:                                      *  CMT33270
                        *         BAL    R14,TSTINIT                                     *  CMT33280
                        * ****************************************************************  CMT33290
                        *                                                                *  CMT33300
2B36   DE60 348A        TSTINIT   OC     DEV,DISARM                                         CMT33310
2B3A   D350 3465                  LB     R5,MASK+1          SET NUMBER OF BYTES PER RECORD  CMT33320
2B3E   4050 3466                  STH    R5,NBYTE                                           CMT33330
2B42   41D0 301C                  BAL    R13,SETMOD                                         CMT33340
2B46   0755                       XHR    R5,R5                                              CMT33350
2B48   4050 196A                  STH    R5,DEVINT          CLEAR INTERRUPT TABLE           CMT33360
2B4C   4050 196C                  STH    R5,DEVINT+2                                        CMT33370
2B50   4050 346A                  STH    R5,EOTFLG                                          CMT33380
2B54   D0F0 3628                  STM    R15,RSAV32                                         CMT33390
2B58   D1F0 362C        TSLONGA   LM     R15,WADDRS                                         CMT33400
2B5C   D0F0 3618                  STM    R15,WLIM           STORE THE STARTING ADDRESS OF WRITE  CMT33410
2B60   4AF0 3466        TSB       AH     R15,NBYTE                                          CMT33420
2B64   D0F0 361C                  STM    R15,WLIM+4         ENDING ADDRESS OF WRITE BUFFER  CMT33430
2B68   D1F0 3630        TSLONGB   LM     R15,RADDRS                                         CMT33440
2B6C   D0F0 3620                  STM    R15,RLIM                                           CMT33450
2B70   4AF0 3466        TSA       AH     R15,NBYTE                                          CMT33460
2B74   D0F0 3624                  STM    R15,RLIM+4                                         CMT33470
2B78   D1F0 3628                  LM     R15,RSAV32                                         CMT33480
2B7C   030E                       BR     R14                                                CMT33490
                        *                                                                *  CMT33500
                        * ****************************************************************  CMT33510
                        * SUBROUTINE TSTSUP                                              *  CMT33520
                        *         THIS ROUTINE SETS UP THE SELCH ADDRESS AND DEVICE      *  CMT33530
                        *         ADDRESS OF THE FIRST DEVICE TO BE TESTED.              *  CMT33540
                        *         THIS ROUTINE SHOULD NOT BE CALLED IF TESTING IS TO     *  CMT33550
                        *         BE DONE ON THE SECOND DEVICE.                          *  CMT33560
                        *         RETURN ON R14.                                         *  CMT33570
                        * ****************************************************************  CMT33580
                        *                                                                *  CMT33590
2B7E   4040 3472        TSTSUP    STH    R4,NXTDEV                                          CMT33600
2B82   4870 181C                  LH     SELCH,SELADR+6     GET SELCH ADDRESS               CMT33610
2B86   4860 1804                  LH     DEV,DEVADR+6       GET DEVICE ADDRESS              CMT33620
2B8A   4060 16D0                  STH    DEV,ERRDEV                                         CMT33630
2B8E   0755                       XHR    R5,R5              RESET SECOND DEVICE FLAG        CMT33640
2B90   4050 3474                  STH    R5,DEV2                                            CMT33650
2B94   030E                       BR     R14                                                CMT33660
                        *                                                                *  CMT33670
                        * ****************************************************************  CMT33680
                        * SUBROUTINE CHKEND & CHKEND1                                    *  CMT33690
                        *         THIS ROUTINE CHECKS IF A SECOND DEVICE IS TO BE        *  CMT33700
                        *         TESTED. IF NOT, IT WILL GO TO TSTEND.                  *  CMT33710
                        *         IF A SECOND DEVICE IS TO BE TESTED, IT PICKS UP        *  CMT33720
                        *         ITS ADDRESS, SET THE FLAG AND BRANCH TO A PRESET       *  CMT33730
                        *         ADDRESS AT LOCATION NXTDEV.                            *  CMT33740
                        * ****************************************************************  CMT33750
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                  *                                                                 *   CMT33760
2B96  41F0 33FC   CHKEND1  BAL   RET,REWIND          REWIND TAPE                        CMT33770
2B9A  4850 3474   CHKEND   LH    R5,DEV2             SECOND DEVICE FLAG SET?            CMT33780
2B9E  4230 0E60            BNZ   TSTEND              YES - END TEST                     CMT33790
2BA2  4860 1810            LH    DEV,DV2ADR+6        GET 2ND DEVICE ADDRESS             CMT33800
2BA6  4330 0E60            BZ    TSTEND              ZERO - END TEST                    CMT33810
2BAA  48F0 3472            LH    R15,NXTDEV          TEST AGAIN                         CMT33820
2BAE  4060 3474            STH   DEV,DEV2            SET 2ND DEVICE FLAG                CMT33830
2BB2  4060 16D0            STH   DEV,ERRDEV                                             CMT33840
2BB6  030F                 BR    R15                                                    CMT33850
                  *                                                                 *   CMT33860
                  * *************************************************************** *   CMT33870
                  *                                                                     CMT33880
                  * SUBROUTINE FSTEOF                                               *   CMT33890
                  *        THIS ROUTINE WRITES AN EOF AND CHECKS IT. IF NMTN        *   CMT33900
                  *        DOES NOT DROP WITHIN ONE INSTRUCTION TIME AFTER THE      *   CMT33910
                  *        OUTPUT COMMAND, ERROR 50 IS LOGGED AND THE TEST          *   CMT33920
                  *        ABORTED ASSUMING THAT THE TAPE DRIVE IS IN THE WRITE     *   CMT33930
                  *        PROTECT MODE.                                            *   CMT33940
                  *        IF NO EOF IS DETECTED AFTER A TIMED WAITING PERIOD,      *   CMT33950
                  *        THIS TEST IS ABORTED.                                    *   CMT33960
                  *        THIS ROUTINE IS USUALLY CALLED AFTER A REWIND, AND       *   CMT33970
                  *        IT RESETS THE EOT FLAG.                                  *   CMT33980
                  *        CALLING SEQUENCE:                                        *   CMT33990
                  *        BAL   R14,FSTEOF                                         *   CMT34000
                  *        ERROR: 50                                                *   CMT34010
                  * *************************************************************** *   CMT34020
                  *                                                                 *   CMT34030
2BB8  40E0 3E88   FSTEOF   STH   R14,SAVERTN         SAVE RETURN ADDRESS                CMT34040
2BBC  0755                 XHR   R5,R5               RESET EOT FLAG                     CMT34050
2BBE  4050 346A            STH   R5,EOTFLG                                              CMT34060
2BC2  DE60 348B            OC    DEV,WEOF            WRITE     EOF                      CMT34070
2BC6  4200 0000            NOP                       WAIT FOR NMTN=0                    CMT34080
2BCA  9D65                 SSR   DEV,STAT                                               CMT34090
2BCC  C350 0010            THI   STAT,X'10'          NMTN=0?                            CMT34100
2BD0  2138                 BNZS  WRTPT               NO - WRITE PROTECT ERROR           CMT34110
2BD2  41E0 2FE2            BAL   R14,SENS01          CHECK EOF                          CMT34120
2BD6  4300 2B96            B     CHKEND1             NO EOF - ABORT TEST                CMT34130
2BDA  48E0 3E88            LH    R14,SAVERTN                                            CMT34140
2BDE  030E                 BR    R14                                                    CMT34150
2BE0  C800 3530   WRTPT    LHI   R0,C'50'            ERROR 50                           CMT34160
2BE4  41F0 0F82            BAL   R15,ERRDS                                              CMT34170
2BE8  4300 0AE6            B     OPTIN                                                  CMT34180
                  *                                                                     CMT34190
                  * *************************************************************** *   CMT34200
                  * SUBROUTINE BSPACE                                               *   CMT34210
                  *        THIS ROUTINE BACKSPACES A RECORD. IF ERROR STATUS        *   CMT34220
                  *        IS SENSED, AN ERROR MESSAGE IS PRINTED.                  *   CMT34230
                  *        RETURNS ON R14                                           *   CMT34240
                  *        ERROR: 08                                                *   CMT34250
                  * *************************************************************** *   CMT34260
                  *                                                                     CMT34270
2BEC  41D0 31BE   BSPACE   BAL   R13,WAIT2           WAIT FOR NMTN=1                    CMT34280
```

SUBROUTINES

```
2BF0  DE60 3483          3425          OC    DEV,BKSPAC          BACKSPACE                                  CMT34290
2BF4  41D0 320C          3426          BAL   R13,WAIT3           WAIT FOR EOM=1                             CMT34300
2BF8  9D65               3427          SSR   DEV,STAT                                                       CMT34310
2BFA  C350 00C0          3428          THI   STAT,X'C0'          ERR OR EOF SET?                            CMT34320
2BFE  033E               3429          BZR   R14                 NO - RETURN                                CMT34330
2C00  C800 3038          3430          LHI   R0,C'08'            STATUS ERROR - 08                          CMT34340
2C04  41F0 0F82          3431          BAL   R15,ERRDS                                                      CMT34350
2C08  030E               3432          BR    R14                                                            CMT34360
                         3433  * ************************************************************************** CMT34370
                         3434  * SUBROUTINE SWAP                                                          * CMT34380
                         3435  *        THIS ROUTINE REVERSES THE WRITE BUFFER                             * CMT34390
                         3436  *        CALLING SEQUENCE:                                                  * CMT34400
                         3437  *        BAL   R14,SWAP                                                     * CMT34410
                         3438  * ************************************************************************** CMT34420
                         3439  *                                                                            * CMT34430
2C0A  07BB               3440  SWAP    XHR   R11,R11                                                        CMT34440
2C0C  48C0 3466          3441          LH    R12,NBYTE                                                      CMT34450
2C10  D0F0 3628          3442          STM   R15,RSAV32                                                     CMT34460
2C14  D1F0 3618          3443          LM    R15,WLIM                                                       CMT34470
2C18  0ABF               3444          AHR   R11,R15                                                        CMT34480
2C1A  0ACF               3445          AHR   R12,R15                                                        CMT34490
2C1C  D1F0 3628          3446          LM    R15,RSAV32                                                     CMT34500
2C20  D34B 0000          3447  SWP1    LB    CHAR,0(R11)                                                    CMT34510
2C24  D35C 0000          3448          LB    STAT,0(R12)                                                    CMT34520
2C28  D24C 0000          3449          STB   CHAR,0(R12)                                                    CMT34530
2C2C  D25B 0000          3450          STB   STAT,0(R11)                                                    CMT34540
2C30  26B1               3451          AIS   R11,1               INCREASE LOWER END POINTER                 CMT34550
2C32  27C1               3452          SIS   R12,1               DECREASE UPPER END POINTER                 CMT34560
2C34  05EC               3453          CLHR  R11,R12             POINTERS MEET OR CROSS?                    CMT34570
2C36  208B               3454          BLS   SWP1                NO - CONTINUE                              CMT34580
2C38  030E               3455          BR    R14                 YES - EXIT                                 CMT34590
                         3456  *                                                                          * CMT34600
                         3457  * ************************************************************************** CMT34610
                         3458  * SUBROUTINE WRTREC                                                        * CMT34620
                         3459  *        THIS ROUTINE WRITES A RECORD ONTO THE MAG. TAPE                     * CMT34630
                         3460  *        IT OPERATES EITHER ON SELCH MODE OR PB/WB MODE.                     * CMT34640
                         3461  *        THE STARTING ADDRESS OF RECORD TO BE WRITTEN IS                     * CMT34650
                         3462  *        STORED AT LOCATION WLIM, AND THE ENDING ADDRESS                     * CMT34660
                         3463  *        AT LOCATION WLIM+2. IF NO ERROR OCCURS DURING THE                   * CMT34670
                         3464  *        TRANSFER. IT WILL RETURN ON 4(R12). ERROR RETURN                    * CMT34680
                         3465  *        IS AT 0(R12)                                                       * CMT34690
                         3466  *        CALLING SEQUENCE:                                                  * CMT34700
                         3467  *        BAL   R12,WRTREC                                                   * CMT34710
                         3468  *        B     ERROR               RETURN HERE ON ERROR                   * CMT34720
                         3469  *        NEXT INSTRUCTION     RETURN HERE ON NORMAL COMPLETION              * CMT34730
                         3470  * ************************************************************************** CMT34740
                         3471  *                                                                            * CMT34750
2C3A  41D0 31BE          3472  WRTREC  BAL   R13,WAIT2           WAIT FOR XMTN=1                            CMT34760
2C3E  9D65               3473          SSR   DEV,STAT                                                       CMT34770
2C40  C350 0020          3474          THI   STAT,X'20'          EOT?                                       CMT34780
2C44  4230 2C78          3475          BNZ   WEOT                YES - SET EOTFLAG                          CMT34790
2C48  4850 346E          3476          LH    R5,MODFLG           WHICH MODE?                                CMT34800
2C4C  C550 0001          3477          CLHI  R5,1                                                           CMT34810
```

SUBROUTINES

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2C50  4330 2C94          3478           BE     WRTBMD            BLOCK MODE                    CMT34820
                         3479  *                                                                 CMT34830
                         3480  *        SELCH MODE                                               CMT34840
                         3481  *                                                                 CMT34850
2C54  D010 3F08          3482           STM    R1,RSAVE                                         CMT34860
2C58  C810 3618          3483           LHI    R1,WLIM           SELCH WRITE LIMITS             CMT34870
2C5C  D320 3485          3484           LB     R2,WRITE          DEVICE WRITE COMMAND           CMT34880
2C60  D330 3480          3485           LB     R3,GOWRT          SELCH GO & WRITE               CMT34890
2C64  C800 3134          3486           LHI    R0,C'14'          ERROR 14                       CMT34900
2C68  C840 3130          3487           LHI    R4,C'10'          ERROR 10                       CMT34910
2C6C  41B0 2D62          3488           BAL    R11,RWREC         WRITE A RECORD                 CMT34920
2C70  4300 2C7E          3489           B      ERROUT                                           CMT34930
2C74  4300 2C8C          3490           B      NORMRET                                          CMT34940
                         3491  *                                                                 CMT34950
2C78  4050 346A          3492  WEOT     STH    STAT,EOTFLG       SET EOT FLAG                   CMT34960
2C7C  030C               3493           BR     R12               ERROR RETURN                   CMT34970
2C7E  D250 16D2          3494  ERROUT   STB    STAT,ERRSTA       SAVE ERROR STATUS
2C82  D110 3F08          3495           LM     R1,RSAVE                                         CMT34980
2C86  D350 16D2          3496           LB     STAT,ERRSTA       GET STATUS
2C8A  030C               3497           BR     R12               ERROR RETURN                   CMT34990
2C8C  D110 3F08          3498  NORMRET  LM     R1,RSAVE                                         CMT35000
2C90  430C 0004          3499           B      4(R12)            NORMAL RETURN                  CMT35010
                         3500  *                                                                 CMT35020
                         3501  *        BLOCK MODE                                               CMT35030
                         3502  *                                                                 CMT35040
2C94  D010 3F08          3503  WRTBMD   STM    R1,RSAVE                                         CMT35050
2C98  D0F0 3628          3504           STM    R15,RSAV32                                       CMT35060
2C9C  D1F0 3618          3505           LM     R15,WLIM                                         CMT35070
2CA0  08BF               3506           LHR    R11,R15                                          CMT35080
2CA2  C8D0 0028          3507           LHI    R13,40                                           CMT35090
2CA6  D1F0 361C          3508  LRFIFTEN LM     R15,WLIM+4                                       CMT35100
2CAA  27D1               3509           SIS    R13,1                                            CMT35110
2CAC  2213               3510           BNMS   LRFIFTEN                                         CMT35120
2CAE  08CF               3511           LHR    R12,R15                                          CMT35130
2CB0  D1F0 3628          3512           LM     R15,RSAV32                                       CMT35140
2CB4  C800 3130          3513           LHI    R0,C'10'          ERROR 10                       CMT35150
2CB8  DE60 3485          3514           OC     DEV,WRITE                                        CMT35160
2CBC  966B               3515           WBR    DEV,R11                                          CMT35170
2CBE  43F0 2CDC          3516           BFC    15,RWTRM1         CONDITION ZERO?                CMT35180
2CC2  D110 3F08          3517  WABEND   LM     R1,RSAVE                                         CMT35190
2CC6  9D65               3518           SSR    DEV,STAT                                         CMT35200
2CC8  4210 32A0          3519           BTC    1,MTDU            DU?                            CMT35210
2CCC  C350 0020          3520           THI    STAT,X'20'        EOT?                           CMT35220
2CD0  2333               3521           BZS    WRTERR2                                          CMT35230
2CD2  4050 346A          3522           STH    STAT,EOTFLG       YES - SET UP EOT FLAG          CMT35240
2CD6  C800 3132          3523  WRTERR2  LHI    R0,C'12'          ERROR 12                       CMT35250
2CDA  030C               3524           BR     R12                                              CMT35260
2CDC  41D0 320C          3525  RWTRM1   BAL    R13,WAIT3         WAITFOR EOM=1                  CMT35270
2CE0  D110 3F08          3526           LM     R1,RSAVE                                         CMT35280
2CE4  9D65               3527           SSR    DEV,STAT                                         CMT35290
2CE6  C350 0080          3528           THI    STAT,X'80'        ERR SET?                       CMT35300
2CEA  4230 2CF2          3529           BNZ    RWREC3                                           CMT35310
2CEE  430C 0004          3530           B      4(R12)            NORMAL RETURN                  CMT35320
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SUBROUTINES

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2CF2  030C            3531  RWREC3  BR    R12                ERROR RETURN                                  CMT35330
                      3532  *                                                                              CMT35340
                      3533  * ************************************************************************     CMT35350
                      3534  * SUBROUTINE RDREC                                                       *     CMT35360
                      3535  *        THIS ROUTINE READS A RECORD FROM THE MAG. TAPE                  *     CMT35370
                      3536  *        IT OPERATES EITHER ON SELCH MODE OR RB/WB MODE.                 *     CMT35380
                      3537  *        THE STARTING ADDRESS OF THE READ BUFFER IS STORED               *     CMT35390
                      3538  *        AT LOCATION RLIM, AND THE ENDING ADDRESS AT                     *     CMT35400
                      3539  *        LOCATION RLIM+2. IF NO ERROR OCCURS DURING THE                  *     CMT35410
                      3540  *        TRANSFER, IT WILL RETURN ON 4(R12). ERROR RETURN                *     CMT35420
                      3541  *        IS AT 0(R12)                                                    *     CMT35430
                      3542  *        CALLING SEQUENCE:                                               *     CMT35440
                      3543  *        BAL   R12,RDREC                                                 *     CMT35450
                      3544  *        B     ERROR                                                     *     CMT35460
                      3545  *        NEXT INSTRUCTION                                                *     CMT35470
                      3546  * ************************************************************************     CMT35480
                      3547  *                                                                              CMT35490
2CF4  41D0 2F62       3548  RDREC   BAL   R13,CRBUF                                                      CMT35500
2CF8  41D0 31BE       3549          BAL   R13,WAIT2          WAIT FOR NMTN=1                             CMT35510
2CFC  4850 346E       3550          LH    R5,MODFLG                                                       CMT35520
2D00  C550 0001       3551          CLHI  R5,1               RB/WB MODE?                                 CMT35530
2D04  4330 2D2C       3552          BE    RDBMD                                                           CMT35540
                      3553  *                                                                              CMT35550
                      3554  *        SELCH MODE                                                            CMT35560
                      3555  *                                                                              CMT35570
2D08  D010 3F08       3556          STM   R1,RSAVE                                                        CMT35580
2D0C  C810 3620       3557          LHI   R1,RLIM            SELCH READ LIMITS                           CMT35590
2D10  D320 3484       3558          LB    R2,READ            DEVICE READ COMMAND                         CMT35600
2D14  D330 3481       3559          LB    R3,GORD            SELCH GO & READ                             CMT35610
2D18  C800 3135       3560          LHI   R0,C'15'           ERROR 15                                    CMT35620
2D1C  C840 3131       3561          LHI   R4,C'11'           ERROR 11                                    CMT35630
2D20  41B0 2D62       3562          BAL   R11,RWREC          READ A RECORD                               CMT35640
2D24  43C0 2C7E       3563          B     ERROUT                                                          CMT35650
2D28  4300 2C8C       3564          B     NORMRET                                                         CMT35660
                      3565  *                                                                              CMT35670
                      3566  *        BLOCK MODE                                                            CMT35680
                      3567  *                                                                              CMT35690
2D2C  D010 3F08       3568  RDBMD   STM   R1,RSAVE                                                        CMT35700
2D30  DCF0 3628       3569          STM   R15,RSAV32                                                      CMT35710
2D34  D1F0 3620       3570          LM    R15,RLIM                                                        CMT35720
2D38  08BF            3571          LHR   R11,R15                                                         CMT35730
2D3A  D1F0 3624       3572          LM    R15,RLIM+4                                                      CMT35740
2D3E  08CF            3573          LHR   R12,R15                                                         CMT35750
2D40  D1F0 3628       3574          LM    R15,RSAV32                                                      CMT35760
2D44  C800 3131       3575          LHI   R0,C'11'           ERROR 11                                    CMT35770
2D48  DE60 3484       3576          OC    DEV,READ                                                        CMT35780
2D4C  976B            3577          RBR   DEV,R11                                                         CMT35790
2D4E  43F0 2CDC       3578          BFC   R15,RWTRM1         CONDITION ZERO? - NORMAL RETURN             CMT35800
2D52  D110 3F08       3579  RABEND  LM    R1,RSAVE                                                        CMT35810
2D56  9D65            3580          SSR   DEV,STAT                                                        CMT35820
2D58  4210 32A0       3581          BTC   1,MTDU             DU?                                         CMT35830
2D5C  C800 3133       3582          LHI   R0,C'13'           ERROR 13                                    CMT35840
2D60  030C            3583          BR    R12                ERROR RETURN                                CMT35850
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SUBROUTINES

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                        3584  * ***************************************************************      CMT35860
                        3585  * SUBROUTINE RWREC                                              *      CMT35870
                        3586  *        THIS ROUTINE READS OR WRITES A RECORD IN SELCH MODE     *      CMT35880
                        3587  *        AND THEN COMPARES THE FINAL ADDRESS TO THE SPECIFIED    *      CMT35890
                        3588  *        ADDRESS TO DETERMINE IF THE TRANSFER WAS COMPLETED      *      CMT35900
                        3589  *        CORRECTLY.                                             *      CMT35910
                        3590  *        ASSUMPTIONS:                                           *      CMT35920
                        3591  *        R1 CONTAINS STARTING ADDRESS OF READ OR WRITE LIMITS    *      CMT35930
                        3592  *        R2 CONTAINS DEVICE COMMAND                             *      CMT35940
                        3593  *        R3 CONTAINS SELCH COMMAND                              *      CMT35950
                        3594  *        R0 CONTAINS ADDRESS MISMATCH ERROR NUMBER              *      CMT35960
                        3595  *        R4 CONTAINS ERROR NUM FOR DEVICE ERR BIT SET CONDITION *      CMT35970
                        3596  *        IF NO ERROR IS DETECTED, THIS ROUTINE RETURNS TO 4(R11),*      CMT35980
                        3597  *        IF AN ERROR IS DETECTED, BRANCH TO 0(R11).             *      CMT35990
                        3598  *        CALLING SEQUENCE:                                      *      CMT36000
                        3599  *        BAL   R11,RWREC                                        *      CMT36010
                        3600  * ***************************************************************      CMT36020
2D62  4850 16C4         3601  RWREC    LH    R5,MOD32                                               CMT36030
2D66  2138              3602           BNZS  RWMOD32                                                CMT36040
2D68  DE70 347E         3603           OC    SELCH,STOP                                             CMT36050
2D6C  D871 0000         3604           WH    SELCH,0(R1)        SET UP SELCH TRANSFER LIMIT         CMT36060
2D70  D871 0004         3605           WH    SELCH,4(R1)        FOR 16 BIT                          CMT36070
2D74  230B              3606           BS    RWREC1                                                 CMT36080
2D76  DE70 3614         3607  RWMOD32  OC    SELCH,STOP2        STOP WITH EXTENDED ADDRESS          CMT36090
2D7A  DA71 0001         3608           WD    SELCH,1(R1)        SET UP SELCH TRANSFER LIMIT         CMT36100
2D7E  D871 0002         3609           WH    SELCH,2(R1)        FOR 32 BIT                          CMT36110
2D82  DA71 0005         3610           WD    SELCH,5(R1)                                            CMT36120
2D86  D871 0006         3611           WH    SELCH,6(R1)                                            CMT36130
2D8A  9E62              3612  RWREC1   OCR   DEV,R2             OUTPUT DEVICE COMMAND               CMT36140
2D8C  2343              3613           BFFS  4,RWREC.A          FALSE SYNC?                         CMT36150
2D8E  41F0 2E12         3614           BAL   R15,FSYNC          YES - ABORT TEST                    CMT36160
2D92  9E73              3615  RWREC.A  OCR   SELCH,R3           OUTPUT SELCH GO & COMMAND           CMT36170
2D94  9D75              3616           SSR   SELCH,STAT         SELCH BUSY?                         CMT36180
2D96  2081              3617           BTBS  8,1                YES - WAIT                          CMT36190
2D98  DE70 347E         3618           OC    SELCH,STOP         STOP SELCH                          CMT36200
2D9C  9D65              3619           SSR   DEV,STAT                                               CMT36210
2D9E  2377              3620           BFFS  7,RWCOM            NORMAL COMPLETION?                  CMT36220
2DA0  C520 0022         3621           CLHI  R2,X'22'           NO - IS DEVICE COMMAND 'WRITE'      CMT36230
2DA4  4230 2D52         3622           BNZ   RABEND             NO - BRANCH TO READ ABEND           CMT36240
2DA8  4300 2CC2         3623           B     WABEND             YES - BRANCH TO WRITE ABEND         CMT36250
2DAC  DE70 347E         3624  RWCOM    OC    SELCH,STOP         NORMAL COMPLETION - STOP SELCH      CMT36260
2DB0  4850 16C4         3625           LH    R5,MOD32                                               CMT36270
2DB4  2138              3626           BNZS  RWCOM32                                                CMT36280
2DB6  9975              3627           RHR   SELCH,R5           IS SELCH FINAL ADDRESS =            CMT36290
2DB8  4551 0004         3628           CLH   R5,4(R1)           ADDRESS SPECIFIED FOR 16 BIT?       CMT36300
2DBC  4230 2DFA         3629           BNE   MISMATCH           NO - ADDRESS MISMATCH               CMT36310
2DC0  4300 2DE4         3630           B     RWTRM                                                  CMT36320
2DC4  DE70 3614         3631  RWCOM32  OC    SELCH,STOP2        IS SELCH FINAL ADDRESS =            CMT36330
2DC8  9B75              3632           RDR   SELCH,R5           ADDRESS SPECIFIED FOR 32 BIT?       CMT36340
2DCA  D451 0005         3633           CLB   R5,5(R1)                                               CMT36350
2DCE  4230 2DFA         3634           BNE   MISMATCH           NO - MISMATCH                       CMT36360
2DD2  9B75              3635           RDR   SELCH,R5                                               CMT36370
2DD4  D451 0006         3636           CLB   R5,6(R1)                                               CMT36380
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SUBROUTINES

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2DD8  4230 2DFA  3637           BNE   MISMATCH          NO - MISMATCH                                  CMT36390
2DDC  9B75       3638           RDR   SELCH,R5                                                         CMT36400
2DDE  D451 0007  3639           CLB   R5,7(R1)                                                        CMT36410
2DE2  213C       3640           BNES  MISMATCH          NO - MISMATCH                                  CMT36420
2DE4  41D0 320C  3641 RWTRM     BAL   R13,WAIT3         WAIT FOR EOM=1                                 CMT36430
2DE8  9D65       3642           SSR   DEV,STAT                                                         CMT36440
2DEA  C350 0080  3643           THI   STAT,X'80'        ERR SET?                                       CMT36450
2DEE  4230 2DF6  3644           BNZ   RWREC2            YES - BRANCH                                   CMT36460
2DF2  430B 0004  3645           B     4(R11)            NORMAL RETURN - TO 2ND INSTRUCTION             CMT36470
                 3646 *                                 AFTER CALL TO RWREC.                           CMT36480
2DF6  0804       3647 RWREC2    LHR   R0,R4             PUT ERROR NUM IN R0                            CMT36490
2DF8  030B       3648           BR    R11               ERROR RETURN                                   CMT36500
2DFA  9D65       3649 MISMATCH  SSR   DEV,STAT          END ADDRESS MISMATCH                           CMT36510
2DFC  4210 32A0  3650           BTC   1,MTDU            DU?                                            CMT36520
2E00  C520 0022  3651           CLHI  R2,X'22'          IS DEVICE COMMAND 'WRITE'                      CMT36530
2E04  023B       3652           BNZR  R11               NO - ERROR NUM IS ALREADY IN R0                CMT36540
2E06  C350 0020  3653           THI   STAT,X'20'        YES - EOT?                                     CMT36550
2E0A  033B       3654           BZR   R11               NO - ERROR NUM IS ALREADY IN R0                CMT36560
2E0C  4050 346A  3655           STH   STAT,EOTFLG       YES - SET EOT FLAG                             CMT36570
2E10  030B       3656           BR    R11               ERROR RETURN                                   CMT36580
                 3657 ********************************************************************           CMT36590
                 3658 * SUBROUTINE FSYNC                                                    *          CMT36600
                 3659 *       THIS ROUTINE IS CALLED WHEN FALSE SYNC IS DETECTED         *          CMT36610
                 3660 *       AFTER AN OUTPUT COMMAND.  IT CALLS ERRALL, AND THEN        *          CMT36620
                 3661 *       BRANCHES TO OPTIN TO ABORT THE TEST.                       *          CMT36630
                 3662 *       CALLED ON R15                                              *          CMT36640
                 3663 * ********************************************************************       CMT36650
                 3664 *                                                                  *          CMT36660
2E12  9500       3665 FSYNC     EPSR  R0,R0             GET CURRENT PSW                                CMT36670
2E14  4000 16CA  3666           STH   R0,OPSW           SAVE PSW                                       CMT36680
2E18  40F0 16CE  3667           STH   R15,OLOC          SAVE LOCATION                                  CMT36690
2E1C  4060 16D0  3668           STH   DEV,ERRDEV        SAVE DEVICE ADDRESS                            CMT36700
2E20  DD60 16D2  3669           SS    DEV,ERRSTA        SAVE STATUS BYTE                               CMT36710
2E24  C800 3030  3670           LHI   R0,C'00'          ERROR 00                                       CMT36720
2E28  4000 173E  3671           STH   R0,ERRNO          SAVE ERROR NUMBER                              CMT36730
2E2C  41F0 0F9A  3672           BAL   R15,ERRALL                                                       CMT36740
2E30  4300 0AE6  3673           B     OPTIN             ABORT TEST                                     CMT36750
                 3674 *                                                                  *          CMT35760
                 3675 * ********************************************************************       CMT36770
                 3676 * SUBROUTINE COMPAR                                                           CMT36780
                 3677 *       THIS ROUTINE COMPARES THE DATA IN THE READ BUFFER          *          CMT36790
                 3678 *       WITH THAT IN THE WRITE BUFFER. IF MISMATCH IS              *          CMT36800
                 3679 *       DETECTED, THE BYTE FROM BOTH BUFFERS ARE PRINTED.          *          CMT36810
                 3680 *       CALLING SEQUENCE:                                          *          CMT36820
                 3681 *       BAL   R14,COMPAR                                           *          CMT36830
                 3682 *       POSSIBLE ERROR: 46, 47                                     *          CMT36840
                 3683 * ********************************************************************       CMT36850
                 3684 *                                                                  *          CMT36860
2E34  D010 3F88  3685 COMPAR   STM   R1,RSAVE1                                                       CMT36870
2E38  2491       3686           LIS   R9,1                                                           CMT36880
2E3A  48A0 3466  3687           LH    R10,NBYTE                                                      CMT36890
2E3E  0788       3688           XHR   R8,R8                                                          CMT36900
2E40  41F0 126A  3689 COMBYT   BAL   R15,TSTBRK         CHECK BREAK KEY                              CMT36910
```

SUBROUTINES

```
2E44  D0F0 3628          3690           STM   R15,RSAV32                                  CMT36920
2E48  D1F0 3620          3691           LM    R15,RLIM                                    CMT36930
2E4C  0AF8               3692           AHR   R15,R8          BYTE NUMBER                 CMT36940
2E4E  D34F 0000          3693           LB    CHAR,0(R15)                                 CMT36950
2E52  D1F0 3618          3694           LM    R15,WLIM        WRITE BUFFER ADDRESS        CMT36960
2E56  0AF8               3695           AHR   R15,R8          BYTE NUMBER                 CMT36970
2E58  D35F 0000          3696           LB    R5,0(R15)       BYTE OF WRITE BUFFER        CMT36980
2E5C  D1F0 3628          3697           LM    R15,RSAV32      RESTORE R15                 CMT36990
2E60  0545               3698           CLHR  CHAR,R5         COMPARE                     CMT37000
2E62  4230 2EA0          3699           BNE   COMERR                                      CMT37010
2E66  C180 2E40          3700           BXLE  R8,COMBYT       CONTINUE                    CMT37020
2E6A  D0F0 3628          3701  CHKDEL   STM   R15,RSAV32                                  CMT37030
2E6E  D1F0 3620          3702           LM    R15,RLIM                                    CMT37040
2E72  0AFA               3703           AHR   R15,R10                                     CMT37050
2E74  26F2               3704           AIS   R15,2                                       CMT37060
2E76  D34F 0000          3705           LB    CHAR,0(R15)                                 CMT37070
2E7A  D1F0 3628          3706           LM    R15,RSAV32                                  CMT37080
2E7E  C540 00C3          3707           CLHI  CHAR,X'C3'      COMPARE - X'C3'             CMT37090
2E82  2339               3708           BES   ENDCOMP                                     CMT37100
2E84  C800 3437          3709           LHI   R0,C'47'        ERROR 47                    CMT37110
2E88  41F0 0F6A          3710           BAL   R15,ERRD                                    CMT37120
2E8C  C850 356A          3711           LHI   R5,MSG08                                    CMT37130
2E90  41D0 3186          3712           BAL   R13,MSGPRT                                  CMT37140
2E94  0711               3713  ENDCOMP  XHR   R1,R1                                       CMT37150
2E96  4010 346C          3714           STH   R1,ERRFLG       RESET ERROR FLAG            CMT37160
2E9A  D110 3F88          3715           LM    R1,RSAVE1                                   CMT37170
2E9E  030E               3716           BR    R14             RETURN                      CMT37180
2EA0  4810 346C          3717  COMERR   LH    R1,ERRFLG       DATA NOT EQUAL - CHECK ERROR FLAG CMT37190
2EA4  4230 2EDA          3718           BNZ   PRIND                                       CMT37200
2EA8  C800 3436          3719           LHI   R0,C'46'        ERROR 46                    CMT37210
2EAC  4000 346C          3720           STH   R0,ERRFLG       SET ERROR FLAG              CMT37220
2EB0  41F0 0F6A          3721           BAL   R15,ERRD                                    CMT37230
2EB4  4050 3E3C          3722           STH   R5,TEMP                                     CMT37240
2EB8  C850 356A          3723           LHI   R5,MSG08                                    CMT37250
2EBC  41D0 3186          3724           BAL   R13,MSGPRT                                  CMT37260
2EC0  C850 34BC          3725           LHI   R5,MSG01A                                   CMT37270
2EC4  41D0 3186          3726           BAL   R13,MSGPRT      PRINT MESSAGE               CMT37280
2EC8  C850 34CC          3727           LHI   R5,MSG01B                                   CMT37290
2ECC  41D0 3186          3728           BAL   R13,MSGPRT      PRINT MESSAGE               CMT37300
2ED0  4850 3E3C          3729           LH    R5,TEMP                                     CMT37310
2ED4  0711               3730           XHR   R1,R1                                       CMT37320
2ED6  4010 16FE          3731           STH   R1,ISITERR                                  CMT37330
2EDA  2402               3732  PRIND    LIS   R0,2                                        CMT37340
2EDC  41F0 10DA          3733           BAL   R15,R5HEX       PRINT DATA BYTE             CMT37350
2EE0  0854               3734           LHR   R5,CHAR                                     CMT37360
2EE2  C840 0020          3735           LHI   R4,X'20'        SPACE                       CMT37370
2EE6  0722               3736           XHR   R2,R2                                       CMT37380
2EE8  D000 3F08          3737  SPACE8   STM   R0,RSAVE                                    CMT37385
2EEC  41F0 11B0          3738           BAL   R15,OUTCHR                                  CMT37390
2EF0  D100 3F08          3739           LM    R0,RSAVE                                    CMT37395
2EF4  2621               3740           AIS   R2,1                                        CMT37400
2EF6  C520 0008          3741           CLHI  R2,8                                        CMT37410
2EFA  2089               3742           BLS   SPACE8                                      CMT37420
```

SUBROUTINES

```
2EFC  2402       3743          LIS   R0,2                                    CMT37430
2EFE  41F0 10DA  3744          BAL   R15,R5HEX        PRINT DATA BYTE          CMT37440
2F02  41F0 11A2  3745          BAL   R15,CRLF                                  CMT37450
2F06  C180 2E40  3746          BXLE  R8,COMBYT        CONTINUE                 CMT37460
2F0A  4300 2E6A  3747          B     CHKDEL                                    CMT37470
                 3748  *                                                       *CMT37480
                 3749  * ***************************************************** CMT37490
                 3750  * SUBROUTINE RESET                                      *CMT37500
                 3751  *       THIS ROUTINE SETS UP THE READ AND WRITE BUFFER  *CMT37510
                 3752  *       LIMITS.                                         *CMT37520
                 3753  *       CALLING SEQUENCE:                               *CMT37530
                 3754  *       BAL   R14,RESET                                 *CMT37540
                 3755  * ***************************************************** CMT37550
                 3756  *                                                       *CMT37560
2F0E  4800 3466  3757  RESET   LH    R0,NBYTE                                  CMT37570
2F12  D0F0 3628  3758          STM   R15,RSAV32                                CMT37580
2F16  D1F0 3618  3759          LM    R15,WLIM                                  CMT37590
2F1A  085F       3760          LHR   R5,R15                                    CMT37600
2F1C  0A50       3761          AHR   R5,R0                                     CMT37610
2F1E  08F5       3762          LHR   R15,R5                                    CMT37620
2F20  D0F0 361C  3763          STM   R15,WLIM+4                                CMT37630
2F24  D1F0 3620  3764          LM    R15,RLIM                                  CMT37640
2F28  085F       3765          LHR   R5,R15                                    CMT37650
2F2A  0A50       3766          AHR   R5,R0                                     CMT37660
2F2C  08F5       3767          LHR   R15,R5                                    CMT37670
2F2E  D0F0 3624  3768          STM   R15,RLIM+4                                CMT37680
2F32  D1F0 3628  3769          LM    R15,RSAV32                                CMT37690
2F36  030E       3770          BR    R14                                       CMT37700
                 3771  *                                                       *CMT37710
                 3772  * ***************************************************** CMT37720
                 3773  * SUBROUTINE BSET                                       *CMT37730
                 3774  *       THIS ROUTINE SETS UP THE WRITE BUFFER. IT FILLS *CMT37740
                 3775  *       THE BUFFER WITH DATA OF 00-FF, AND SETS THE DELIMITER *CMT37750
                 3776  *       AT THE END OF THE READ BUFFER.                  *CMT37760
                 3777  *       CALLING SEQUENCE:                               *CMT37770
                 3778  *       BAL   R14,BSET                                  *CMT37780
                 3779  * ***************************************************** CMT37790
                 3780  *                                                       *CMT37800
2F38  D010 3F88  3781  BSET    STM   R1,RSAVE1                                 CMT37810
2F3C  2491       3782          LIS   R9,1                                      CMT37820
2F3E  48A0 3466  3783          LH    R10,NBYTE                                 CMT37830
2F42  0788       3784          XHR   R8,R8                                     CMT37840
2F44  0858       3785  SETWBUF LHR   R5,R8                                     CMT37850
2F46  4450 3464  3786          NH    R5,MASK          MASK FOR 7 TRACK         CMT37860
2F4A  D1F0 3618  3787          LM    R15,WLIM                                  CMT37870
2F4E  0AF8       3788          AHR   R15,R8                                    CMT37880
2F50  D25F 0000  3789          STB   R5,0(R15)                                 CMT37890
2F54  41F0 126A  3790          BAL   R15,TSTBRK       CHECK BREAK KEY          CMT37900
2F58  C180 2F44  3791          BXLE  R8,SETWBUF                                CMT37910
2F5C  D110 3F88  3792          LM    R1,RSAVE1                                 CMT37920
2F60  030E       3793          BR    R14                                       CMT37930
                 3794  *                                                       *CMT37940
                 3795  * ***************************************************** CMT37950
```

SUBROUTINES

```
                        3796  * SUBROUTINE CRBUF                                                 *        CMT37960
                        3797  *        THIS ROUTINE CLEARS THE READ BUFFER AND SETS THE          *        CMT37970
                        3798  *        DELIMETER (X'C3C3') AT THE END OF THE BUFFER              *        CMT37980
                        3799  *        CALLING SEQUENCE:                                        *        CMT37990
                        3800  *        BAL   R13,CRBUF                                          *        CMT38000
                        3801  * ********************************************************************        CMT38010
                        3802  *                                                                  *        CMT38020
2F62   D010 3F88        3803  CRBUF    STM   R1,RSAVE1                                                   CMT38030
2F66   D1F0 3624        3804          LM    R15,RLIM+4                                                  CMT38040
2F6A   08AF             3805          LHR   R10,R15                                                     CMT38050
2F6C   2492             3806          LIS   R9,2                                                        CMT38060
2F6E   0755             3807          XHR   R5,R5                                                       CMT38070
2F70   D1F0 3620        3808          LM    R15,RLIM                                                    CMT38080
2F74   088F             3809          LHR   R8,R15                                                      CMT38090
2F76   4058 0000        3810  CRBUF1   STH   R5,0(R8)                                                  CMT38100
2F7A   41F0 126A        3811          BAL   R15,TSTBRK          CHECK BREAK KEY                         CMT38110
2F7E   C180 2F76        3812          BXLE  R8,CRBUF1                                                   CMT38120
2F82   C950 C3C3        3813          LHI   R5,X'C3C3'                                                  CMT38130
2F86   D25A 0002        3814          STB   R5,2(R10)                                                   CMT38140
2F8A   D110 3F88        3815          LM    R1,RSAVE1                                                   CMT38150
2F8E   030D             3816          BR    R13                                                         CMT38160
                        3817  *                                                                  *        CMT38170
                        3818  * ********************************************************************        CMT38180
                        3819  * SUBROUTINE DUMP                                                  *        CMT38190
                        3820  *        THIS ROUTINE DUMPS THE READ BUFFER ONE BYTE AT A          *        CMT38200
                        3821  *        TIME AND 16 BYTES IN A LINE.                             *        CMT38210
                        3822  *        CALLING SEQUENCE:                                        *        CMT38220
                        3823  *        BAL   R14,DUMP                                           *        CMT38230
                        3824  * ********************************************************************        CMT38240
                        3825  *                                                                  *        CMT38250
2F90   D010 3F88        3826  DUMP     STM   R1,RSAVE1                                                   CMT38260
2F94   2491             3827          LIS   R9,1                                                        CMT38270
2F96   24AF             3828          LIS   R10,15              16 BYTES PER LINE                       CMT38280
2F98   0722             3829          XHR   R2,R2                                                       CMT38290
2F9A   C840 0020        3830          LHI   R4,X'20'            SPACE                                   CMT38300
2F9E   0788             3831  OUTDMP   XHR   R8,R8                                                      CMT38310
2FA0   D0F0 3628        3832  DMPLIN   STM   R15,RSAV32         SAVE R15                                CMT38320
2FA4   D1F0 3620        3833          LM    R15,RLIM            READ BUFFER ADDRESS                     CMT38330
2FA8   0AF2             3834          AHR   R15,R2                                                      CMT38340
2FAA   D35F 0000        3835          LB    R5,0(R15)           LOAD BYTE FROM READ BUFFER              CMT38350
2FAE   D1F0 3628        3836          LM    R15,RSAV32          RESTORE R15                             CMT38360
2FB2   2402             3837          LIS   R0,2                                                        CMT38370
2FB4   41F0 10DA        3838          BAL   R15,R5HEX           PRINT BYTE                              CMT38380
2FB8   41F0 11B0        3839          BAL   R15,OUTCHR          PRINT SPACE                             CMT38390
2FBC   41F0 126A        3840          BAL   R15,TSTBRK          BREAK?                                  CMT38400
2FC0   4520 3466        3841          CLH   R2,NBYTE            FULL BUFFER PRINTED?                    CMT38410
2FC4   2388             3842          BNLS  DUBLIN                                                      CMT38420
2FC6   2621             3843          AIS   R2,1                NO - CONTINUE                           CMT38430
2FC8   C180 2FA0        3844          BXLE  R8,DMPLIN           16 BYTES?                               CMT38440
2FCC   41F0 11A2        3845          BAL   R15,CRLF            YES - CR,LF                             CMT38450
2FD0   4300 2F9E        3846          B     OUTDMP                                                      CMT38460
2FD4   41F0 11A2        3847  DUBLIN   BAL   R15,CRLF            DOUBLE LINE FEED                        CMT38470
2FD8   41F0 11A2        3848          BAL   R15,CRLF                                                    CMT38480
```

SUBROUTINES

```
2FDC  D110 3F88          3849          LM    R1,RSAVE1                                    CMT38490
2FE0  030E               3850          BR    R14                 RETURN                   CMT38500
                         3851  *                                                            *CMT38510
                         3852  * ********************************************************** CMT38520
                         3853  * SUBROUTINE SENS01, SENS02 & SENS03                        * CMT38530
                         3854  *       THIS ROUTINE DETERMINES WHETHER AN EOF HAS BEEN     * CMT38540
                         3855  *       DETECTED. IF NOT, AN ERROR MESSAGE WILL BE PRINTED  * CMT38550
                         3856  *       AND RETURN ON ERROR. IF NO ERROR IS DETECTED, IT    * CMT38560
                         3857  *       WILL RETURN TO LOCATION 4(R14)                      * CMT38570
                         3858  *       THREE ENTRY POINTS ARE PROVIDED:                    * CMT38580
                         3859  *       SENS01     FOR SENSING EOF AFTER WEOF               * CMT38590
                         3860  *       SENS02     FOR SENSING EOF AFTER READ               * CMT38600
                         3861  *       SENS03     FOR SENSING EOF AFTER SKIP & BACKSPACE   * CMT38610
                         3862  *       CALLING SEQUENCE:                                   * CMT38620
                         3863  *       BAL   R14,SENS01          (EXAMPLE)                 * CMT38630
                         3864  *       B     ERROR               ERROR RETURN HERE         * CMT38640
                         3865  *       NEXT INSTRUCTION          NORMAL RETURN HERE        * CMT38650
                         3866  * ********************************************************** CMT38660
                         3867  *                                                            *CMT38670
2FE2  C800 3035          3868  SENS01  LHI   R0,C'05'            ERROR 05 (WEOF)           CMT38680
2FE6  2306               3869          BS    SENEOF                                       CMT38690
2FE8  C800 3036          3870  SENS02  LHI   R0,C'06'            ERROR 06 (READ EOF)       CMT38700
2FEC  2303               3871          BS    SENEOF                                       CMT38710
2FEE  C800 3037          3872  SENS03  LHI   R0,C'07'            ERROR 07 (SKIP & BACKSPACE EOF) CMT38720
2FF2  41D0 320C          3873  SENEOF  BAL   R13,WAIT3           WAIT FOR EOM=1            CMT38730
2FF6  9D65               3874          SSR   DEV,STAT                                     CMT38740
2FF8  2348               3875          BFFS  4,EOFER             EX BIT SET?               CMT38750
2FFA  C350 0080          3876          THI   STAT,X'80'          ERR BIT SET?              CMT38760
2FFE  2135               3877          BNZS  EOFER                                        CMT38770
3000  C350 0040          3878          THI   STAT,X'40'          EOF DETECTED?             CMT38780
3004  423E 0004          3879          BNZ   4(R14)                                       CMT38790
3008  41F0 0F82          3880  EOFER   BAL   R15,ERRDS                                    CMT38800
300C  030E               3881          BR    R14                                          CMT38810
                         3882  *                                                            *CMT38820
                         3883  * ********************************************************** CMT38830
                         3884  * SUBROUTINE ERRMSG2                                        * CMT38840
                         3885  *       THIS SUBROUTINE   PRINTS THE ERROR MESSAGES WITH THE * CMT38850
                         3886  *       MODE MESSAGE                                        * CMT38860
                         3887  *       THE MESSAGE PRINTED IS:                             * CMT38870
                         3888  *       ERROR  XXYY               XX=TEST #, YY=ERROR #     * CMT38880
                         3889  *       DEV  DD  STA SS           DD=DEVICE #, SS=STATUS    * CMT38890
                         3890  *       MODE  N                   N=MODE NUMBER             * CMT38900
                         3891  *       RETURN ON R14                                       * CMT38910
                         3892  * ********************************************************** CMT38920
300E  41E0 0F82          3893  ERRMSG2 BAL   R15,ERRDS           PRINT ERROR MESSAGE       CMT38930
3012  C850 356A          3894          LHI   R5,MSG08                                     CMT38940
3016  41D0 3186          3895          BAL   R13,MSGPRT                                   CMT38950
301A  030E               3896          BR    R14                                          CMT38960
                         3897  * ********************************************************** CMT38970
                         3898  * SUBROUTINE SETMOD & TSTMOD                                * CMT38980
                         3899  *       THESE ROUTINES SET THE PROPER MODE THE DEVICE IS TO  * CMT38990
                         3900  *       BE TESTED UNDER.                                    * CMT39000
                         3901  *       ROUTINE SETMOD SETS THE INITIAL TEST MODE ACCORDING  * CMT39010
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SUBROUTINES

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                        3902  *        TO THE OPTION MODE. IF ZERO, IT WILL SET MODE 2          *        CMT39020
                        3903  *        ROUTINE TSTMOD TESTS IF ANY MORE TEST IS TO BE           *        CMT39030
                        3904  *        PERFORMED UNDER A DIFFERENT MODE. IF MODE OPTION          *        CMT39040
                        3905  *        IS ZERO, IT WILL DECREMENT MODE. IF MODE OPTION IS        *        CMT39050
                        3906  *        NON-ZERO OR DECREMENTED MODE IS ZERO. IT WILL BRANCH      *        CMT39060
                        3907  *        TO TEST END.                                             *        CMT39070
                        3908  *        CALLING SEQUENCE:                                                 CMT39080
                        3909  *        BAL   R13,SETMOD     OR                                           CMT39090
                        3910  *        BAL   R13,TSTMOD                                                  CMT39100
                        3911  * ************************************************************************ CMT39110
                        3912  *                                                                           CMT39120
301C   4850 1840        3913  SETMOD   LH    R5,MODE+6           GET MODE OPTION                        CMT39130
3020   213C             3914           BNZS  MSET                                                       CMT39140
3022   2452             3915           LIS   R5,2                MODE 0 - START WITH MODE 2             CMT39150
3024   230A             3916           BS    MSET                                                       CMT39160
3026   4850 1840        3917  TSTMOD   LH    R5,MODE+6           MODE 0?                                CMT39170
302A   4230 2B9A        3918           BNZ   CHKEND              NO - END TEST                          CMT39180
302E   4850 346E        3919           LH    R5,MODFLG           YES -                                  CMT39190
3032   2751             3920           SIS   R5,1                DECREMENT MODE FLAG                    CMT39200
3034   4330 2B9A        3921           BZ    CHKEND              ZERO? - END TEST                       CMT39210
3038   4050 346E        3922  MSET     STH   R5,MODFLG           STORE                                  CMT39220
303C   CA50 0030        3923           AHI   R5,X'30'                                                   CMT39230
3040   D250 356F        3924           STB   R5,MSG08+5          SET MODE MESSAGE                       CMT39240
3044   41F0 126A        3925           BAL   R15,TSTBRK          CHECK BREAK KEY                        CMT39250
3048   030D             3926           BR    R13                                                        CMT39260
                        3927  * ************************************************************************ CMT39270
                        3928  * SUBROUTINE RETRY                                                 *        CMT39280
                        3929  *        THIS ROUTINE KEEPS A RETRY COUNT. IF THE COUNT IS        *        CMT39290
                        3930  *        LESS THAN 5, THE ROUTINE WILL BACKSPACE AND RETURN       *        CMT39300
                        3931  *        AT LOCATION 0(R14). OTHERWISE, IT RETURNS AT 4(R14).     *        CMT39310
                        3932  *        CALLING SEQUENCE:                                        *        CMT39320
                        3933  *        BAL   R14,RETRY                                          *        CMT39330
                        3934  *        B     TRY AGAIN           GO TRY AGAIN                   *        CMT39340
                        3935  *        B     PROCEED             PROCEED                        *        CMT39350
                        3936  * ************************************************************************ CMT39360
                        3937  *                                                                  *        CMT39370
304A   4850 3470        3938  RETRY    LH    R5,RTYCNT           LOAD RETRY COUNTER                     CMT39380
304E   C550 0005        3939           CLHI  R5,5                5 TIMES?                               CMT39390
3052   238B             3940           BNLS  RTYFAIL                                                    CMT39400
3054   2651             3941           AIS   R5,1                INCREMENT COUNTER                      CMT39410
3056   4050 3470        3942           STH   R5,RTYCNT                                                  CMT39420
305A   41D0 31BE        3943           BAL   R13,WAIT2           WAIT FOR NMTN=1                        CMT39430
305E   DE60 3483        3944           OC    DEV,BKSPAC          BACKSPACE                              CMT39440
3062   41F0 126A        3945           BAL   R15,TSTBRK           CHECK BREAK KEY                        CMT39450
3066   030E             3946           BR    R14                                                        CMT39460
3068   0755             3947  RTYFAIL  XHR   R5,R5               5 TIMES FAILED                         CMT39470
306A   4050 3470        3948           STH   R5,RTYCNT                                                  CMT39480
306E   C850 34DC        3949           LHI   R5,MSG02                                                   CMT39490
3072   41D0 3186        3950           BAL   R13,MSGPRT          PRINT MESSAGE                          CMT39500
3076   41F0 126A        3951           BAL   R15,TSTBRK          CHECK BREAK KEY                        CMT39510
307A   430E 0004        3952           B     4(R14)                                                     CMT39520
                        3953  * ************************************************************************ CMT39530
                        3954  *                                                                  *        CMT39540
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SUBROUTINES

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                        3955  * SUBROUTINE INDATA                                                  *  CMT39550
                        3956  *        THIS ROUTINE ACCEPTS A DATA STRING OF UP TO 64 BYTES       *  CMT39560
                        3957  *        FROM THE TTY. THE INPUT CHARACTER MUST BE A VALID          *  CMT39570
                        3958  *        HEX CHARACTER. AND THE PROGRAM WILL STORE THE              *  CMT39580
                        3959  *        CORRESPONDING HEX VALUE INTO THE WRITE BUFFER. UPON        *  CMT39590
                        3960  *        RECEPTION OF CR, THE ROUTING WILL GENERATE THE WHOLE       *  CMT39600
                        3961  *        WRITE BUFFER BY REPEATING THE INPUTED STRING               *  CMT39610
                        3962  *                                                                   *  CMT39620
                        3963  *        IF THE TEST IS REPEATED BY MODE=0, CONTIN=1 OR LOOP,       *  CMT39630
                        3964  *        THIS ROUTINE WILL BE BY-PASSED AFTER THE FIRST PASS.       *  CMT39640
                        3965  *        NO DATA IS REQUESTED ON SUBSEQUENT PASSES. THIS            *  CMT39650
                        3966  *        ROUTINE WILL NEVER BE EXECUTED IF OPTION DATA IS           *  CMT39660
                        3967  *        RESET.                                                     *  CMT39670
                        3968  *        CALLING SEQUENCE                                           *  CMT39680
                        3969  *        BAL   R14,INDATA                                           *  CMT39690
                        3970  *                                                                   *  CMT39700
                        3971  * ***************************************************************** *  CMT39710
                        3972  *                                                                   *  CMT39720
307E  4840 190C         3973  INDATA  LH    R4,DATA+6          DATA OPTION SET?                   CMT39730
3082  033E              3974        BZR   R14                 NO - EXIT                          CMT39740
3084  4840 3468         3975        LH    R4,DE               DATA FLAG SET?                     CMT39750
3088  023E              3976        BNZR  R14                 YES - EXIT                         CMT39760
308A  244F              3977        LIS   R4,15               NO - SET DATA FLAG                 CMT39770
308C  4040 3468         3978        STH   R4,DE               AND                                CMT39780
3090  D010 3F88         3979        STM   R1,RSAVE1           GET DATA PATTERN                   CMT39790
3094  C850 3572         3980        LHI   R5,MSG09            PRINT MESSAGE                      CMT39800
3098  41D0 3186         3981        BAL   R13,MSGPRT                                             CMT39810
309C  41F0 126A         3982        BAL   R15,TSTBRK          CHECK BREAK KEY                    CMT39820
30A0  2491              3983        LIS   R9,1                                                   CMT39830
30A2  0788              3984        XHR   R8,R8                                                  CMT39840
30A4  0722              3985        XHR   R2,R2                                                  CMT39850
30A6  D080 3F08         3986  GETDATA STM   R8,RSAVE                                             CMT39860
30AA  41F0 121C         3987        BAL   R15,GETCHR          GET A CHARACTER                    CMT39870
30AE  D180 3F08         3988        LM    R8,RSAVE                                               CMT39880
30B2  C540 000D         3989        CLHI  CHAR,X'0D'          CR?                                CMT39890
30B6  4330 314C         3990        BE    INEND               YES - INPUT END                    CMT39900
30BA  41D0 3158         3991        BAL   R13,HEXCHK          CHECK FOR HEX CHAR                 CMT39910
30BE  220C              3992        BS    GETDATA             INVALID DATA, GET ANOTHER          CMT39920
30C0  0854              3993        LHR   R5,CHAR                                                CMT39930
30C2  9154              3994        SLLS  R5,4                SHIFT FIRST HEX DIGIT LEFT         CMT39940
30C4  D080 3F08         3995        STM   R8,RSAVE                                               CMT39950
30C8  41F0 121C         3996  GTDAT2  BAL   R15,GETCHR         GET SECOND CHARACTER               CMT39960
30CC  D180 3F08         3997        LM    R8,RSAVE                                               CMT39970
30D0  C540 000D         3998        CLHI  CHAR,X'0D'          CR?                                CMT39980
30D4  4330 310E         3999        BE    INEND1              YES - INPUT END                    CMT39990
30D8  41D0 3158         4000        BAL   R13,HEXCHK          CHECK HEX CHAR                     CMT40000
30DC  220A              4001        BS    GTDAT2              INVALID DATA, GET ANOTHER          CMT40010
30DE  0654              4002        OHR   R5,CHAR             APPEND SECOND HEX DIGIT            CMT40020
30E0  4450 3464         4003        NH    R5,MASK                                                CMT40030
30E4  D0F0 3628         4004        STM   R15,RSAV32                                             CMT40040
30E8  D1F0 3618         4005        LM    R15,WLIM                                               CMT40050
30EC  0AF8              4006        AHR   R15,R8                                                 CMT40060
30EE  D25F 0000         4007        STB   R5,0(R15)                                              CMT40070
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SUBROUTINES

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30F2  D1E0 3628          4008            LM    R15,RSAV32                                  CMT40080
30F6  2622               4009            AIS   R2,2                                        CMT40090
30F8  C520 0040          4010            CLHI  R2,64              64 CHARACTERS (32 HEX)?  CMT40100
30FC  4380 3120          4011            BNL   INEND2                                      CMT40110
3100  C180 30A6          4012            BXLE  R8,GETDATA         BUFFER LENGTH EXCEED?    CMT40120
3104  41F0 11A2          4013  DATFIL    BAL   R15,CRLF                                    CMT40130
3108  D110 3F88          4014            LM    R1,RSAVE1                                   CMT40140
310C  030E               4015            BR    R14                                         CMT40150
310E  D0F0 3628          4016  INEND1    STM   R15,RSAV32                                  CMT40160
3112  D1E0 3618          4017            LM    R15,WLIM                                    CMT40170
3116  0AF8               4018            AHR   R15,R8                                      CMT40180
3118  D25F 0000          4019            STB   R5,0(R15)                                   CMT40190
311C  D1E0 3628          4020            LM    R15,RSAV32                                  CMT40200
3120  0722               4021  INEND2    XHR   R2,R2                                       CMT40210
3122  C080 3104          4022  MOVDATA   BXH   R8,DATFIL                                   CMT40220
3126  D0F0 3628          4023  MOVDAT1   STM   R15,RSAV32                                  CMT40230
312A  D1F0 3618          4024            LM    R15,WLIM                                    CMT40240
312E  0AF2               4025            AHR   R15,R2                                      CMT40250
3130  D34F 0000          4026            LB    CHAR,0(R15)                                 CMT40260
3134  D1E0 3618          4027            LM    R15,WLIM                                    CMT40270
3138  0AF8               4028            AHR   R15,R8                                      CMT40280
313A  D25F 0000          4029            STB   R5,0(R15)                                   CMT40290
313E  D1F0 3628          4030            LM    R15,RSAV32                                  CMT40300
3142  41F0 126A          4031            BAL   R15,TSTBRK         CHECK BREAK KEY          CMT40310
3146  2621               4032            AIS   R2,1                                        CMT40320
3148  4300 3122          4033            B     MOVDATA                                     CMT40330
314C  0822               4034  INEND     LHR   R2,R2                                       CMT40340
314E  4330 3104          4035            BZ    DATFIL                                      CMT40350
3152  0722               4036            XHR   R2,R2                                       CMT40360
3154  4300 3126          4037            B     MOVDAT1                                     CMT40370
                         4038  * ************************************************************ CMT40380
                         4039  * SUBROUTINE HEXCHK                                          * CMT40390
                         4040  *        THIS ROUTINE CHECKS IF THE CONTENT OF R4 (CHAR) IS   * CMT40400
                         4041  *        A VALID HEX CHARACTER. IT THEN CONVERTS IT INTO A    * CMT40410
                         4042  *        HEX DIGIT, AND RETURNS AT 4(R13). IF THE CHARACTER   * CMT40420
                         4043  *        IS NOT A VALID HEX CHARACTER, IT OUTPUTS A '?',      * CMT40430
                         4044  *        AND RETURNS AT 0(R13)                               * CMT40440
                         4045  *        CALLING SEQUENCE:                                   * CMT40450
                         4046  *        BAL   R13,HEXCHK                                    * CMT40460
                         4047  *        B     ERROR              ERROR RETURN             * CMT40470
                         4048  *        NEXT  INSTRUCTION        NORMAL RETURN            * CMT40480
                         4049  * ************************************************************ CMT40490
                         4050  *                                                            * CMT40500
                         4051  *                                                            * CMT40510
3158  C540 0030          4052  HEXCHK    CLHI  CHAR,C'0'          LESS THAN 0?             CMT40520
315C  4280 317C          4053            BL    NOHEX              YES - INVALID            CMT40530
3160  C540 003A          4054            CLHI  CHAR,X'3A'         NO - LESS THAN X'3A'?    CMT40540
3164  2188               4055            BLS   GDHEX              YES - VALID              CMT40550
3166  C540 0041          4056            CLHI  CHAR,C'A'          NO - LESS THAN A?        CMT40560
316A  2189               4057            BLS   NOHEX              YES - INVALID            CMT40570
316C  C540 0047          4058            CLHI  CHAR,C'G'          NO - GREATER THAN F?     CMT40580
3170  2386               4059            BNLS  NOHEX              YES - INVALID            CMT40590
3172  2649               4060            AIS   CHAR,9             NO - CONVERT TO HEX DIGIT CMT40600
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SUBROUTINES

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3174  C440 000F   GDHEX   NHI   CHAR,X'0F'                                              CMT40610
3178  430D 0002           B     2(R13)                                                  CMT40620
317C  C840 003F   NOHEX   LHI   CHAR,C'?'          INVALID CHAR -                       CMT40630
3180  41F0 11B0           BAL   R15,OUTCHR         PRINT '?'                            CMT40640
3184  030D                BR    R13                                                     CMT40650
                  * ***************************************************************     CMT40660
                  * SUBROUTINE MSGPRT                                                   CMT40670
                  *       THIS ROUTINE SETS UP THE CALLING SEQUENCE TO PRINT       *    CMT40680
                  *       A MESSAGE. THE STARTING ADDRESS OF THE MESSAGE           *    CMT40690
                  *       SHOULD BE STORED IN R5.                                  *    CMT40700
                  *       CALLING SEQUENCE:                                        *    CMT40710
                  *       BAL   R13,MSGPRT                                         *    CMT40720
                  * ***************************************************************     CMT40730
                  *                                                                *    CMT40740
3186  4050 16FE   MSGPRT  STH   R5,ISITERR                                              CMT40750
318A  41F0 112A           BAL   R15,PRINT                                               CMT40760
318E  0755                XHR   R5,R5                                                   CMT40770
3190  4050 16FE           STH   R5,ISITERR                                              CMT40780
3194  41F0 126A           BAL   R15,TSTBRK         CHECK BREAK KEY                      CMT40790
3198  03CD                BR    R13                                                     CMT40800
                  *                                                                *    CMT40810
                  * ***************************************************************     CMT40820
                  * SUBROUTINE TIMEOUT                                             *    CMT40830
                  *       THIS ROUTINE WAITS FOR INTERRUPT WITH INTERRUPT          *    CMT40840
                  *       ENABLED AT PROCESSOR LEVEL. A TIMER IS SET UP TO         *    CMT40850
                  *       TIME OUT THE INTERRUPT WAITING PERIOD AND THE            *    CMT40860
                  *       CALLING PROGRAM CAN SPECIFY THE TIME-OUT IN UNITS        *    CMT40870
                  *       OF 10MS EACH BY SPECIFY THE NUMBER OF UNITS DESIRED      *    CMT40880
                  *       AT THE HALFWORD FOLLOWING THE CALLING INSTRUCTION.       *    CMT40890
                  *       IF INTERRUPT IS RECEIVED, EXIT IS MADE TO AN             *    CMT40900
                  *       INTERRUPT HANDLER IN THE PROGRAM EXECUTIVE. WHICH        *    CMT40910
                  *       WILL IN TURN BRANCH TO LOCATION SET UP BY THE            *    CMT40920
                  *       PROGRAM BEFORE ENTERING TIMEOUT ROUTINE.                 *    CMT40930
                  *       IF THE ROUTINE TIMES OUT, IT WILL PICK UP THE ERROR      *    CMT40940
                  *       NUMBER FROM R11, PRINT THE ERROR MESSAGE, AND EXIT AT    *    CMT40950
                  *       LOCATION 4(R14).                                         *    CMT40960
                  *       CALLING SEQUENCE:                                        *    CMT40970
                  *       BAL   R14,TIMEOUT                                        *    CMT40980
                  *       DC    N                  NUMBER OF 10MS UNITS FOR T.O.   *    CMT40990
                  * ***************************************************************     CMT41000
                  *                                                                *    CMT41010
319A  48C0 0A22   TIMEOUT LH    R0,PSW             ENABLE INTERRUPT AT                  CMT41020
319E  9550                EPSR  R5,R0              PROCESSOR LEVEL                      CMT41030
31A0  41F0 126A           BAL   R15,TSTBRK         CHECK BREAK KEY                      CMT41040
31A4  48CE 0000           LH    R0,0(R14)          PICK UP DESIRED TIME PERIOD          CMT41050
31A8  41F0 10C0           BAL   R15,TIMER          DELAY TIMER (BASIC 10MS)             CMT41060
31AC  C800 30F0           LHI   R0,X'30F0'         DISABLE INTERRUPTS AT                CMT41070
31B0  9550                EPSR  R5,R0              PROCESSOR LEVEL                      CMT41080
31B2  080B                LHR   R0,R11             PICK UP ERROR NUMBER                 CMT41090
31B4  9D65                SSR   DEV,STAT                                                CMT41100
31B6  41F0 0F82           BAL   R15,ERRDS                                               CMT41110
31BA  430E 0002           B     2(R14)                                                  CMT41120
                  * ***************************************************************     CMT41130
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SUBROUTINES

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                        4114  * SUBROUTINE WAIT2                                                 *  CMT41140
                        4115  *        THIS ROUTINE WAITS FOR NMTN=1 UNDER TIMED CONDITION      *  CMT41150
                        4116  *        IF ROUTINE TIMES OUT OR DETECTS END OF TAPE (EOT),        *  CMT41160
                        4117  *        THE DEVICE IS RESET, ERROR MESSAGE IS PRINTED AND         *  CMT41170
                        4118  *        THE CURRENT TEST IS ABORTED.                              *  CMT41180
                        4119  *        RETURN ON R13                                             *  CMT41190
                        4120  *        ERROR: 01                                                 *  CMT41200
                        4121  * ********************************************************************  CMT41210
31BE  9D65              4122  WAIT2    SSR   DEV,STAT                                              CMT41220
31C0  4210 32A0         4123           BTC   1,MTDU              DEVICE UNAVAILABLE                CMT41230
31C4  C350 0010         4124           THI   STAT,X'10'          NMTN = 1?                         CMT41240
31C8  023D              4125           BNZR  R13                 YES - EXIT                        CMT41250
31CA  D010 3F88         4126           STM   R1,RSAVE1                                             CMT41260
31CE  2421              4127           LIS   R2,1                                                  CMT41270
31D0  4830 0A1E         4128           LH    R3,TIME             10MS TIMING LOOP                  CMT41280
31D4  0892              4129           LHR   R9,R2                                                 CMT41290
31D6  24AA              4130           LIS   R10,10                                                CMT41300
31D8  0788              4131           XHR   R8,R8                                                 CMT41310
31DA  0711              4132  WX21     XHR   R1,R1               TIME OUT LOOP                     CMT41320
31DC  9D65              4133  WX22     SSR   DEV,STAT                                              CMT41330
31DE  4210 32A0         4134           BTC   1,MTDU              DU?                               CMT41340
31E2  C350 0010         4135           THI   STAT,X'10'          NMTN = 1?                         CMT41350
31E6  4230 3206         4136           BNZ   W2EXIT              YES EXIT                          CMT41360
31EA  41E0 126A         4137           BAL   R15,TSTBRK          CHECK BREAK KEY                   CMT41370
31EE  C110 31DC         4138           BXLE  R1,WX22                                               CMT41380
31F2  C180 31DA         4139           BXLE  R8,WX21                                               CMT41390
31F6  DE60 347F         4140           OC    DEV,CLEAR           TIMED OUT ON NMTN                 CMT41400
31FA  C800 3031         4141           LHI   R0,C'01'            ERROR 01                          CMT41410
31FE  41E0 0F82         4142           BAL   R15,ERRDS                                             CMT41420
3202  4300 0AE6         4143           B     OPTIN                                                 CMT41430
3206  D110 3F88         4144  W2EXIT   LM    R1,RSAVE1                                           CMT41440
320A  030D              4145           BR    R13                                                   CMT41450
                        4146  * ********************************************************************  CMT41460
                        4147  * SUBROUTINE WAIT3                                                 *  CMT41470
                        4148  *        THIS ROUTINE WAITS FOR EOM UNDER TIMED CONDITION.         *  CMT41480
                        4149  *        IT IS CALLED AFTER EVERY READ, WRITE, BACKSPACE,          *  CMT41490
                        4150  *        WEOF OR SKIP OPERATION. IF EOM IS NOT SET AFTER           *  CMT41500
                        4151  *        TIME OUT, THE ROUTINE RETURNS WITH AN ERROR MESSAGE       *  CMT41510
                        4152  *        CALLING SEQUENCE:                                         *  CMT41520
                        4153  *        BAL   R13,WAIT3                                           *  CMT41530
                        4154  *                                                                  *  CMT41540
                        4155  * ********************************************************************  CMT41550
320C  9D65              4156  WAIT3    SSR   DEV,STAT                                              CMT41560
320E  4210 32A0         4157           BTC   1,MTDU              DU?                               CMT41570
3212  022D              4158           BTCR  2,R13               EOM - EXIT                        CMT41580
3214  D010 3F88         4159           STM   R1,RSAVE1                                             CMT41590
3218  2421              4160           LIS   R2,1                SET UP TIME OUT COUNTER           CMT41600
321A  4830 0A1E         4161           LH    R3,TIME                                               CMT41610
321E  0892              4162           LHR   R9,R2                                                 CMT41620
3220  C8A0 0064         4163           LHI   R10,100                                               CMT41630
3224  0788              4164           XHR   R8,R8                                                 CMT41640
3226  0711              4165  WX31     XHR   R1,R1                                                 CMT41650
3228  9D65              4166  WX32     SSR   DEV,STAT                                              CMT41660
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SUBROUTINES

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322A 4210 32A0  4167           BTC   1,MTDU            DU?                                  CMT41670
322E 4220 3246  4168           BTC   2,W3EXIT          EOM - EXIT                           CMT41680
3232 41F0 126A  4169           BAL   R15,TSTBRK        CHECK BREAK KEY                      CMT41690
3236 C110 3228  4170           BXLE  R1,WX32                                                CMT41700
323A C180 3226  4171           BXLE  R8,WX31                                                CMT41710
323E C800 3034  4172           LHI   R0,C'04'          TIMED OUT - ERROR 04                 CMT41720
3242 41F0 0F82  4173           BAL   R15,ERRDS                                              CMT41730
3246 D110 3F88  4174  W3EXIT   LM    R1,RSAVE1                                              CMT41740
324A 030D       4175           BR    R13               ERROR RETURN                         CMT41750
                4176  *                                                                    CMT41760
                4177  * ********************************************************************CMT41770
                4178  * SUBROUTINE WAIT1                                                   *CMT41780
                4179  *        THIS ROUTINE WAITS FOR NMTN=1 UNDER TIMED CONDITION.        *CMT41790
                4180  *        THE TIMEOUT PERIOD IS DESIGNED TO ACCOMODATE THE            *CMT41800
                4181  *        TIME NECESSARY TO REWIND THE LONGEST TAPE. IF THE           *CMT41810
                4182  *        ROUTINE TIMED OUT, THE TEST IS ABORTED WITH AN ERROR        *CMT41820
                4183  *        MESSAGE .                                                   *CMT41830
                4184  *        RETURN ON R13                                               *CMT41840
                4185  *        ERROR: 02.                                                  *CMT41850
                4186  * ********************************************************************CMT41860
324C D010 3F88  4187  WAIT1    STM   R1,RSAVE1                                              CMT41870
3250 0755       4188           XHR   R5,R5                                                  CMT41880
3252 4050 346A  4189           STH   R5,EOTFLG                                              CMT41890
3256 2421       4190           LIS   R2,1              SET UP LOOP COUNTER                  CMT41900
3258 C830 7FF0  4191           LHI   R3,X'7FF0'                                             CMT41910
325C 0892       4192           LHR   R9,R2                                                  CMT41920
325E C8A0 00FF  4193           LHI   R10,X'FF'                                              CMT41930
3262 0788       4194           XHR   R8,R8                                                  CMT41940
3264 0711       4195  WX11     XHR   R1,R1             TIME OUT LOOP                        CMT41950
3266 9D65       4196  WX12     SSR   DEV,STAT                                               CMT41960
3268 4210 32A0  4197           BTC   1,MTDU            DU?                                  CMT41970
326C C350 0010  4198           THI   STAT,X'10'        NMTN = 1 ?                           CMT41980
3270 4230 329A  4199           BNZ   W1EXIT            YES EXIT                             CMT41990
3274 C350 0020  4200           THI   STAT,X'20'        EOT?                                 CMT42000
3278 2335       4201           BZS   WX13                                                   CMT42010
327A DE60 347F  4202           OC    DEV,CLEAR         EOT - CLEAR DEVICE                   CMT42020
327E 41F0 126A  4203           BAL   R15,TSTBRK         CHECK BREAK KEY                      CMT42030
3282 C110 3266  4204  WX13     BXLE  R1,WX12                                                CMT42040
3286 C180 3264  4205           BXLE  R8,WX11                                                CMT42050
328A DE60 347F  4206           OC    DEV,CLEAR         TIME OUT ON NMTN                     CMT42060
328E C800 3032  4207           LHI   R0,C'02'          ERROR 02                             CMT42070
3292 41F0 0F82  4208           BAL   R15,ERRDS                                              CMT42080
3296 4300 0AE6  4209           B     OPTIN                                                  CMT42090
329A D110 3F88  4210  W1EXIT   LM    R1,RSAVE1                                              CMT42100
329E 030D       4211           BR    R13                                                    CMT42110
                4212  *                                                                    CMT42120
                4213  * ********************************************************************CMT42130
                4214  *        DEVICE UNAVAILABLE:                                         CMT42140
                4215  *        RETURN TO INPUT COMMAND MODE                                CMT42150
                4216  * ********************************************************************CMT42160
                4217  *                                                                    CMT42170
32A0 DE70 347E  4218  MTDU     OC    SELCH,STOP                                             CMT42180
32A4 D250 16D2  4219           STB   STAT,ERRSTA                                            CMT42190
                                                                                           CMT42190
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SUBROUTINES

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32A8  C850 34F4          4220          LHI   R5,MSG03          MAGNETIC TAPE DEVICE UNAVAILABLE      CMT42200
32AC  4050 16FE          4221          STH   R5,ISITERR                                            CMT42210
32B0  41F0 112A          4222          BAL   R15,PRINT          PRINT MESSAGE                      CMT42220
32B4  41E0 101E          4223          BAL   RET,ERRDS1         PRINT DEVICE # AND STATUS          CMT42230
32B8  0755               4224          XHR   R5,R5                                                 CMT42240
32BA  4050 16FE          4225          STH   R5,ISITERR                                            CMT42250
32BE  4300 0AE6          4226          B     OPTIN                                                 CMT42260
                         4227  * ************************************************************      CMT42270
                         4228  * SUBROUTINE EOF                                                   CMT42280
                         4229  *       THIS ROUTINE WRITES AN EOF                             *    CMT42290
                         4230  *       CALLING SEQUENCE                                       *    CMT42300
                         4231  *       BAL   R14,EOF                                          *    CMT42310
                         4232  * ************************************************************      CMT42320
                         4233  *                                                                *    CMT42330
32C2  41D0 32D6          4234  EOF     BAL   R13,SENMTN         CHECK FOR NMTN=1                   CMT42340
32C6  DE60 348B          4235          OC    DEV,WEOF           WRITE AN EOF                       CMT42350
32CA  030E               4236          BR    R14                NO EOT - EXIT                      CMT42360
                         4237  * ************************************************************      CMT42370
                         4238  * SUBROUTINE RWND                                                *    CMT42380
                         4239  *       THIS ROUTINE REWINDS THE TAPE                          *    CMT42390
                         4240  *       CALLING SEQUENCE:                                      *    CMT42400
                         4241  *       BAL   R14,RWND                                         *    CMT42410
                         4242  * ************************************************************      CMT42420
32CC  41D0 32D6          4243  RWND    BAL   R13,SENMTN         CHECK FOR NMTN=1                   CMT42430
32D0  DE60 3482          4244          OC    DEV,REWD           REWIND                             CMT42440
32D4  030E               4245          BR    R14                RETURN                             CMT42450
                         4246  * ************************************************************      CMT42460
                         4247  * SUBROUTINE SENMTN                                              *    CMT42470
                         4248  *       THIS ROUTINE WAITS FOR NMTN=1.                         *    CMT42480
                         4249  *       RETURNS ON R13                                         *    CMT42490
                         4250  * ************************************************************      CMT42500
32D6  9D65               4251  SENMTN  SSR   DEV,STAT                                            CMT42510
32D8  C350 0010          4252          THI   STAT,X'10'         NMTN=1?                            CMT42520
32DC  023D               4253          BNZR  R13                YES - RETURN                       CMT42530
32DE  41F0 126A          4254          BAL   R15,TSTBRK         CHECK BREAK KEY                    CMT42540
32E2  2206               4255          BS    SENMTN             LOOP CHECK                         CMT42550
                         4256  * ************************************************************      CMT42560
                         4257  * SUBROUTINE WRTBLK                                              CMT42570
                         4258  *       THIS ROUTINE WAITS FOR NMTN, AND WRITES A RECORD       *    CMT42580
                         4259  *       USING WB MODE                                          *    CMT42590
                         4260  *       THE STARTING & ENDING ADDRESSES OF THE RECORD ARE       *    CMT42600
                         4261  *       STORED IN R11 & R12 RESPECTIVELY                       *    CMT42610
                         4262  * ************************************************************      CMT42620
                         4263  *                                                                *    CMT42630
32E4  41D0 32D6          4264  WRTBLK  BAL   R13,SENMTN         CHECK FOR NMTN=1                   CMT42640
32E8  DE60 3485          4265          OC    DEV,WRITE          DEVICE WRITE MODE                  CMT42650
32EC  966B               4266          WBR   DEV,R11            WRITE RECORD BLOCK MODE            CMT42660
32EE  030E               4267          BR    R14                RETURN                             CMT42670
                         4268  * ************************************************************      CMT42680
                         4269  * SUBROUTINE RDBLK                                               CMT42690
                         4270  *       THIS ROUTINE READS A RECORD IN THE RB MODE. THE STARTING CMT42700
                         4271  *       & ENDING ADDRESSES ARE ASSUMED TO BE IN R11 & R12       *    CMT42710
                         4272  *       RESPECTIVELY.                                          *    CMT42720
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                        4273  * ***************************************************************** CMT42730
                        4274  *                                                                 * CMT42740
32F0   41D0 32D6        4275  RDBLK    BAL   R13,SENMTN          CHECK FOR NMTN=1              CMT42750
32F4   DE60 3484        4276           OC    DEV,READ            DEVICE READ MODE              CMT42760
32F8   976B             4277           RBR   DEV,R11             READ RECORD BLOCK MODE        CMT42770
32FA   030E             4278           BR    R14                 RETURN                        CMT42780
                        4279  * ***************************************************************** CMT42790
                        4280  * SUBROUTINE BKSP                                                 * CMT42800
                        4281  *        THIS ROUTINE WAITS FOR NMTN, AND DOES A BACKSPACE        * CMT42810
                        4282  *        IT MUST BE NOTED THAT THIS ROUTINE CANNOT BE CALLED      * CMT42820
                        4283  *        AT     BOT                                               * CMT42830
                        4284  * ***************************************************************** CMT42840
                        4285  *                                                                 * CMT42850
32FC   41D0 32D6        4286  BKSP     BAL   R13,SENMTN          CHECK FOR NMTN=1              CMT42860
3300   DE60 3483        4287           OC    DEV,BKSPAC          BACK-SPACE                    CMT42870
3304   030E             4288           BR    R14                 RETURN                        CMT42880
                        4289  * ***************************************************************** CMT42890
                        4290  * SUBROUTINE RWSEL                                                * CMT42900
                        4291  *        THIS ROUTINE READS OR WRITES A RECORD WITH SELCH MODE.    * CMT42910
                        4292  *        THE STARTING & ENDING ADDRESSES OF THE RECORD            * CMT42920
                        4293  *        ARE ASSUMED TO BE IN R11 & R12 RESPECTIVELY.             * CMT42930
                        4294  *        DEVICE COMMAND IS ASSUMED TO BE IN R2, AND SELCH         * CMT42940
                        4295  *        COMMAND IS ASSUMED TO BE IN R3.                          * CMT42950
                        4296  *        RETURN ON R14                                            * CMT42960
                        4297  * ***************************************************************** CMT42970
3306   41D0 32D6        4298  RWSEL    BAL   R13,SENMTN          CHECK FOR NMTN=1              CMT42980
330A   D010 3F88        4299           STM   R1,RSAVE1                                         CMT42990
330E   4890 15C4        4300           LH    R9,MOD32                                          CMT43000
3312   2139             4301           BNZS  RWSEL32                                           CMT43010
3314   D110 3F88        4302           LM    R1,RSAVE1                                         CMT43020
3318   DE70 347E        4303           OC    SELCH,STOP          STOP SELCH                    CMT43030
331C   987B             4304           WHR   SELCH,R11           STARTING ADDRESS              CMT43040
331E   987C             4305           WHR   SELCH,R12           ENDING ADDRESS                CMT43050
3320   4300 333C        4306           B     RWSEL.B                                           CMT43060
3324   DE70 3614        4307  RWSEL32  OC    SELCH,STOP2                                       CMT43070
3328   DA70 3FB1        4308           WD    SELCH,RSAVE1+41                                   CMT43080
332C   D870 3FB2        4309           WH    SELCH,RSAVE1+42                                   CMT43090
3330   DA70 3FB5        4310           WD    SELCH,RSAVE1+45                                   CMT43100
3334   D870 3FB6        4311           WH    SELCH,RSAVE1+46                                   CMT43110
3338   D110 3F88        4312           LM    R1,RSAVE1                                         CMT43120
333C   9E62             4313  RWSEL.B  OCR   DEV,R2              DEVICE COMMAND                CMT43130
333E   2343             4314           BFFS  4,RWSEL.A           FALSE SYNC?                   CMT43140
3340   41E0 2E12        4315           BAL   R15,FSYNC            YES - ABORT TEST              CMT43150
3344   9E73             4316  RWSEL.A  OCR   SELCH,R3            SELCH GO & COMMAND            CMT43160
3346   9D75             4317           SSR   SELCH,STAT                                        CMT43170
3348   2081             4318           BTBS  8,1                 WAIT FOR SELCH IDLE           CMT43180
334A   DE70 347E        4319           OC    SELCH,STOP                                        CMT43190
334E   030E             4320           BR    R14                                               CMT43200
                        4321  * ***************************************************************** CMT43210
                        4322  * SUBROUTINE SELINT                                               * CMT43220
                        4323  *        THIS ROUTINE TESTS SELCH INTERRUPTS ON READ OR WRITE.    * CMT43230
                        4324  *        ASSUMPTIONS:                                             * CMT43240
                        4325  *        R1 CONTAINS DEVICE COMMAND                               * CMT43250
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SUBROUTINES

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                                4326  *        R2 CONTAINS SELCH COMMAND                                      *        CMT43260
                                4327  *        R3 CONTAINS STARTING ADDRESS OF READ OR WRITE LIMITS           *        CMT43270
                                4328  *        R4 CONTAINS DEVICE INTERRUPT RETURN ADDRESS                    *        CMT43280
                                4329  *        R5 CONTAINS SELCH INTERRUPT RETURN ADDRESS                     *        CMT43290
                                4330  *        R11 CONTAINS THE TIMEOUT ERROR NUMBER                          *        CMT43300
                                4331  *        RETURN ON R12                                                  *        CMT43310
                                4332  * ************************************************************************        CMT43320
3350  4050 196A                 4333  SELINT   STH   R5,DEVINT          STORE RTN ADRS FOR SELCH INTERRUPT           CMT43330
3354  0755                      4334           XHR   R5,R5              RESET RETURN ADDRESS                         CMT43340
3356  4050 196C                 4335           STH   R5,DEVINT+2        FOR DEVICE INTERRUPT                         CMT43350
335A  41D0 31BE                 4336           BAL   R13,WAIT2          WAIT FOR NMTN=1                              CMT43360
335E  4850 16C4                 4337           LH    R5,MOD32                                                      CMT43370
3362  2138                      4338           BNZS  XMOD32                                                        CMT43380
3364  DE70 347E                 4339           OC    SELCH,STOP         STOP SELCH                                   CMT43390
3368  D873 0000                 4340           WH    SELCH,0(R3)        SET UP SELCH TRANSFER LIMITS                 CMT43400
336C  D873 0004                 4341           WH    SELCH,4(R3)                                                   CMT43410
3370  230B                      4342           BS    XDEV                                                          CMT43420
3372  DE70 3614                 4343  XMOD32   OC    SELCH,STOP2        STOP WITH EXTENDED ADDRESS                   CMT43430
3376  DA73 0001                 4344           WD    SELCH,1(R3)                                                   CMT43440
337A  D873 0002                 4345           WH    SELCH,2(R3)                                                   CMT43450
337E  DA73 0005                 4346           WD    SELCH,5(R3)                                                   CMT43460
3382  D873 0006                 4347           WH    SELCH,6(R3)                                                   CMT43470
3386  9E61                      4348  XDEV     OCR   DEV,R1             OUTPUT DEVICE COMMAND                        CMT43480
3388  9E72                      4349           OCR   SELCH,R2           OUTPUT SELCH COMMAND                         CMT43490
338A  41E0 319A                 4350           BAL   R14,TIMEOUT        WAIT FOR SELCH INTERRUPT                     CMT43500
338E  01F4                      4351           DC    H'500'                                                        CMT43510
3390  DE70 347E                 4352  SELINT1  OC    SELCH,STOP                                                    CMT43520
3394  0755                      4353           XHR   R5,R5              RESET RETURN ADDRESS                         CMT43530
3396  4050 196A                 4354           STH   R5,DEVINT          FOR SELCH INTERRUPT                          CMT43540
339A  4040 196C                 4355           STH   R4,DEVINT+2        STORE DEVICE INTERRUPT RETURN ADRS           CMT43550
339E  030C                      4356           BR    R12                RETURN                                       CMT43560
                                4357  * ************************************************************************        CMT43570
                                4358  * SUBROUTINE SKIPINT                                                   *        CMT43580
                                4359  *        THIS ROUTINE TESTS SKIP INTERRUPTS ON FORWARD OR               *        CMT43590
                                4360  *        BACKWARD SKIPS.                                                *        CMT43600
                                4361  *        ASSUMPTIONS:                                                   *        CMT43610
                                4362  *        R1 CONTAINS THS SKIP COMMAND                                   *        CMT43620
                                4363  *        R11 CONTAINS THE TIMEOUT ERROR NUMBER                          *        CMT43630
                                4364  *        RETURN ON R12                                                  *        CMT43640
                                4365  * ************************************************************************        CMT43650
                                4366  SKIPINT  XHR   R8,R8                                                        CMT43660
33A0  0788                      4367           LHI   R5,RTN11           SET UP RETURN ADDRESS                        CMT43670
33A2  C850 33C0                 4368           STH   R5,DEVINT+2                                                   CMT43680
33A6  4050 196C                 4369  SKIPINT1 BAL   R13,WAIT2                                                    CMT43690
33AA  41D0 31BE                 4370           OC    DEV,DISARM         DISARM DEVICE                                CMT43700
33AE  DE60 348A                 4371           OC    DEV,ENABL                                                     CMT43710
33B2  DE60 3489                 4372           OCR   DEV,R1             OUTPUT SKIP COMMAND                          CMT43720
33B6  9E61                      4373           BAL   R14,TIMEOUT                                                   CMT43730
33B8  41E0 319A                 4374           DC    H'2000'                                                       CMT43740
33BC  07D0                      4375           BS    STA11                                                         CMT43750
33BE  230A                      4376  RTN11    LB    STAT,INTSTA        GET INTERRUPT STATUS                         CMT43760
33C0  D350 16D2                 4377           CLHI  STAT,X'4C'                                                    CMT43770
33C4  C550 004C                 4378           BES   STA11                                                         CMT43780
33C8  2335
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SUBROUTINES

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33CA  C800 3037          4379            LHI   R0,C'07'            ERROR 07                    CMT43790
33CE  4300 1FB2          4380            B     STAERR                                          CMT43800
33D2  2681               4381  STA11     AIS   R8,1                                           CMT43810
33D4  C580 0002          4382            CLHI  R8,2                2 EOF'S?                    CMT43820
33D8  4280 33AA          4383            BL    SKIPINT1                                        CMT43830
33DC  03CC               4384            BR    R12                                             CMT43840
                         4385  * ************************************************************* CMT43850
                         4386  *                                                               * CMT43860
                         4387  * SUBROUTINES SKFW & SKRV                                       * CMT43870
                         4388  *       THIS ROUTINE SKIPS A FILE PASS AN EOF                   * CMT43880
                         4389  * ************************************************************* CMT43890
                         4390  *                                                               * CMT43900
33DE  41D0 32D6          4391  SKFW      BAL   R13,SENMTN          CHECK FOR NMTN=1            CMT43910
33E2  DE60 3486          4392            OC    DEV,SKIPF           SKIP EOF FORWARD            CMT43920
33E6  030E               4393            BR    R14                                             CMT43930
33E8  41D0 32D6          4394  SKRV      BAL   R13,SENMTN          CHECK FOR NMTN=1            CMT43940
33EC  DE60 3487          4395            OC    DEV,SKIPR           SKIP EOF REVERSE            CMT43950
33F0  03CE               4396            BR    R14                                             CMT43960
                         4397  * ************************************************************* CMT43970
                         4398  * SUBROUTINE ERRDSA SAVES THE ERROR NUM (R0) AND THE STATUS     * CMT43980
                         4399  * BYTE (STAT) FOR USE BY ERRDS                                  * CMT43990
                         4400  * ************************************************************* CMT44000
                         4401  *                                                               * CMT44010
33F2  4000 173E          4402  ERRDSA    STH   R0,ERRNO            SAVE ERROR NUM              CMT44020
33F6  D250 16D2          4403            STB   STAT,ERRSTA         SAVE STATUS BYTE            CMT44030
33FA  030E               4404            BR    RET                                             CMT44040
                         4405  * ************************************************************* CMT44050
                         4406  * SUBROUTINE REWIND WAITS FOR NMTN=1, REWINDS THE TAPE, AND     * CMT44060
                         4407  * WAITS FOR NMTN=1 AGAIN.                                       * CMT44070
                         4408  * ************************************************************* CMT44080
                         4409  *                                                               CMT44090
33FC  41D0 324C          4410  REWIND    BAL   R13,WAIT1           WAIT FOR NMTN=1             CMT44100
3400  DE60 3482          4411            OC    DEV,REWD            REWIND TAPE                 CMT44110
3404  41D0 324C          4412            BAL   R13,WAIT1           WAIT FOR NMTN=1             CMT44120
3408  030E               4413            BR    RET                 RETURN                      CMT44130
                         4414  * ************************************************************* CMT44140
                         4415  *                                                               * CMT44150
                         4416  *       ROUTINES TO CHECK VALID OPTION VALUES                   * CMT44160
                         4417  * ************************************************************* CMT44170
                         4418  *                                                               * CMT44180
340A  C360 FFFE          4419  ZERONE    TMI   R6,X'FFFE'                                      CMT44190
340E  033F               4420            BCR   R15                 REJECT                      CMT44200
3410  030C               4421            BR    R12                 OK                          CMT44210
3412  C560 0009          4422  TRACKS    CLHI  R6,9                NINE OR                     CMT44220
3416  033F               4423            BER   R15                                             CMT44230
3418  C560 0007          4424            CLHI  R6,7                SEVEN                       CMT44240
341C  033F               4425            BER   R15                                             CMT44250
341E  030C               4426            BR    R12                                             CMT44260
3420  C560 0003          4427  MODES     CLHI  R6,3                NO MORE THAN 2              CMT44270
3424  028F               4428            BLR   R15                                             CMT44280
3426  030C               4429            BR    R12                                             CMT44290
3428  C560 0100          4430  X256      CLHI  R6,X'100'           NO MORE THAN X'FF'          CMT44300
342C  028F               4431            BLR   R15                                             CMT44310
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SUBROUTINES

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342E  030C            4432             BR    R12                                    CMT44320
3430  C560 0002       4433  MIN2       CLHI  R6,2                                   CMT44330
3434  028C            4434             BLR   R12              LESS THAN 2 - REJECT  CMT44340
3436  2301            4435             BS    X3FF                                   CMT44350
3438  4560 3612       4436  X3FF       CLH   R6,X400          NO MORE THAN X'400'   CMT44360
343C  028F            4437             BLR   R15                                    CMT44370
343E  030C            4438             BR    R12                                    CMT44380
3440  0866            4439  DEVCHN     LHR   R6,R6                                  CMT44390
3442  2235            4440             BZS   X3FF                                   CMT44400
3444  0755            4441             XHR   R5,R5                                  CMT44410
3446  2207            4442             BS    X3FF                                   CMT44420
3448  C560 0006       4443  SCOP       CLHI  R6,6             NO MORE THAN 5        CMT44430
344C  028F            4444             BLR   R15                                    CMT44440
344E  030C            4445             BR    R12                                    CMT44450
3450  C560 0005       4446  LEVEL      CLHI  R6,5             NO MORE THAN 4        CMT44460
3454  038C            4447             BNLR  R12                                    CMT44470
3456  D260 1966       4448             STB   R6,INTLVL                              CMT44480
345A  D260 1967       4449             STB   R6,INTLVL+1                            CMT44490
345E  D260 1968       4450             STB   R6,INTLVL+2                            CMT44500
3462  030F            4451             BR    R15                                    CMT44510
                      4452  * ********************************************************** CMT44520
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                         4454  * ********************************************************************          CMT44540
                         4455  *        CONSTANTS                                                   *          CMT44550
                         4456  * ********************************************************************          CMT44560
                         4457  *                                                                    *          CMT44570
3464  FFFF               4458  MASK     DC    X'FFFF'                                                       CMT44580
3466  00FF               4459  NBYTE    DC    X'FF'                                                         CMT44590
3468  0000               4460  DE       DC    0                                                             CMT44600
346A  0000               4461  EOTFLG   DC    0                                                             CMT44610
346C  0000               4462  ERRFLG   DC    0                                                             CMT44620
346E  0000               4463  MODFLG   DC    0                                                             CMT44630
3470  0000               4464  RTYCNT   DC    0                                                             CMT44640
3472  0000               4465  NXTDEV   DC    0                                                             CMT44650
3474  0000               4466  DEV2     DC    0                                                             CMT44660
3476  0000               4467  WLRS     DC    0                                                             CMT44670
3478  0000               4468  DEVONE   DC    0                                                             CMT44680
347A  2929               4469  CRCC     DC    X'2929'                                                       CMT44690
347C  6A29               4470  CRCCS    DC    X'6A29'                                                       CMT44700
347E  0820               4471  STOP     DC    X'0820'                                                       CMT44710
      0000 347F          4472  CLEAR    EQU   STOP+1                                                        CMT44720
3480  5070               4473  GOWRT    DC    X'5070'                                                       CMT44730
      0000 3481          4474  GORD     EQU   GOWRT+1                                                       CMT44740
3482  3811               4475  REWD     DC    X'3811'                                                       CMT44750
      0000 3483          4476  BKSPAC   EQU   REWD+1                                                       CMT44760
3484  2122               4477  READ     DC    X'2122'                                                       CMT44770
      0000 3485          4478  WRITE    EQU   READ+1                                                       CMT44780
3486  2313               4479  SKIPF    DC    X'2313'                                                       CMT44790
      0000 3487          4480  SKIPR    EQU   SKIPF+1                                                      CMT44800
3488  8040               4481  DSABL    DC    X'8040'                                                       CMT44810
      0000 3489          4482  ENABL    EQU   DSABL+1                                                      CMT44820
348A  C030               4483  DISARM   DC    X'C030'                                                       CMT44830
      0000 348B          4484  WEOF     EQU   DISARM+1                                                     CMT44840
348C  00FF               4485  WDATA    DC    X'00FF',X'00FF'                                               CMT44850
348E  00FF
3490  00FF               4486           DC    X'00FF',X'00FF'                                               CMT44860
3492  00FF
3494  0102               4487           DC    X'0102',X'0408'                                               CMT44870
3496  0408
3498  1020               4488           DC    X'1020',X'4080'                                               CMT44880
349A  4080
349C  7FBF               4489           DC    X'7FBF',X'DFEF'                                               CMT44890
349E  DFEF
34A0  F7FB               4490           DC    X'F7FB',X'FDFE'                                               CMT44900
34A2  FDFE
34A4  AA55               4491           DC    X'AA55',X'AA55'                                               CMT44910
34A6  AA55
34A8  AA55               4492           DC    X'AA55',X'AA55'                                               CMT44920
34AA  AA55
34AC  F00F               4493           DC    X'F00F',X'F00F'                                               CMT44930
34AE  F00F
34B0  F00F               4494           DC    X'F00F',X'F00F'                                               CMT44940
34B2  F00F
34B4  0000               4495           DC    0                                                             CMT44950
34B6  0D16               4496  SQMASK   DC    X'0D16',X'0102',X'0506'                                       CMT44960
34B8  0102
34BA  0506
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34BC  4441 5441 2020 2020  4497  MSG01A   DC    C'DATA      DATA',X'D00'                                CMT44970
34C4  2020 4441 5441
34CA  0D00
34CC  5752 4954 5445 4E20  4498  MSG01B   DC    C'WRITTEN   READ',X'D00'                              CMT44980
34D4  2020 5245 4144
34DA  0D00
34DC  5245 434F 5645 5259  4499  MSG02     DC    C'RECOVERY UNSUCCESSFUL',X'0A0D'                    CMT44990
34E4  2055 4E53 5543 4345
34EC  5353 4655 4C20
34F2  0A0D
34F4  4445 5649 4345 204F  4500  MSG03     DC    C'DEVICE OFF-LINE',X'D00'                           CMT45000
34FC  4646 2D4C 494E 4520
3504  0D00
3506  454F 5420             4501  MSG04     DC    C'EOT',X'D00'                                       CMT45010
350A  0D00
350C  454F 4620             4502  MSG04A    DC    C'EOF',X'D00'                                       CMT45020
3510  0D00
3512  4144 4420 4352 4320  4503  MSG05     DC    C'ADD CRC CAPACITOR AND EXECUTE',X'D00'             CMT45030
351A  4341 5041 4349 544F
3522  5220 414E 4420 4558
352A  4543 5554 4520
3530  0D00
3532  4352 4320 4348 4152  4504  MSG06     DC    C'CRC CHAR =      ',X'D00'                          CMT45040
353A  203D 2020 2020 2020
3542  0D00
3544  4352 4320 4348 4152  4505  MSG07     DC    C'CRC CHAR EXPT''D =      , READ =      ',X'D00'    CMT45050
354C  2045 5850 5427 4420
3554  3D20 2020 2020 2C20
355C  5245 4144 203D 2020
3564  2020 2020
3568  0D00
356A  4D4F 4445 2020        4506  MSG08     DC    C'MODE  ',X'D00'                                    CMT45060
3570  0D00
3572  454E 5445 5220 4441  4507  MSG09     DC    C'ENTER DATA:',X'D00'                               CMT45070
357A  5441 3A20
357E  0D00
3580  5455 524E 2044 4556  4508  MSG10     DC    C'TURN DEVICE OFF-LINE MOMENTARILY.',X'D00'         CMT45080
3588  4943 4520 4F46 462D
3590  4C49 4E45 204D 4F4D
3598  454E 5441 5249 4C59
35A0  2E20
35A2  0D00
35A4  4552 524F 523A 2052  4509  LABBEL    DC    C'ERROR: READ BUFFER IN TEST PROGRAM'               CMT45090
35AC  4541 4420 4255 4646
35B4  4552 2049 4E20 5445
35BC  5354 2050 524F 4752
35C4  414D
35C6  0D00                  4510              DC    X'D00'                                              CMT45100
35C8  4552 524F 523A 2057  4511  LABELL    DC    C'ERROR: WRITE BUFFER IN TEST PROGRAM'              CMT45110
35D0  5249 5445 2042 5546
35D8  4645 5220 494E 2054
35E0  4553 5420 5052 4F47
35E8  5241 4D20
35EC  0D00                  4512              DC    X'D00'                                              CMT45120
35EE  4552 524F 523A 2052  4513  LAABEL    DC    C'ERROR: READ BUFFER IN WRITE BUFFER'               CMT45130
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35F6   4541 4420 4255 4646
35FE   4552 2049 4E20 5752
3606   4954 4520 4255 4646
360E   4552
3610   0D00                    4514            DC    X'D00'                                    CMT45140
                               4515   *  ALL TEST PROGRAM STORAGE AREA                         CMT45150
                               4516   *                                                       CMT45160
                               4517   *                                                       CMT45170
3612   0401                    4518   X400     DC    X'401'                                    CMT45180
3614   4800                    4519   STOP2    DC    X'4800'                                   CMT45190
3618                           4520            ALIGN 8                                         CMT45200
3618   0000 0000               4521   WLIM     DCY   0                                         CMT45210
361C   0000 0000               4522            DCY   0                                         CMT45220
3620   0000 0000               4523   RLIM     DCY   0                                         CMT45230
3624   0000 0000               4524            DCY   0                                         CMT45240
3628   0000 0000               4525   RSAV32   DCY   0                                         CMT45250
362C   0000 0000               4526   WADDRS   DCY   0                                         CMT45260
3630   0000 0000               4527   RADDRS   DCY   0                                         CMT45270
3634   0000 0000               4528   MEMTOP   DCY   0                                         CMT45280
3638   3FFF                    4529   LAST     DC    X'3FFF'                                   CMT45290
       0000 3639               4530   LNZB     EQU   *-1                                       CMT45300
363A                           4531   WBUFF    DS    X'400'                                    CMT45310
3A3A                           4532   RBUFF    DS    X'402'                                    CMT45320
3E3C                           4533   TEMP     DS    2                 TEMPORARY STORAGE LOC   CMT45330
3E40                           4534            ALIGN 8                                         CMT45340
3E40                           4535   OPTBUF   DS    6                 OPTION INPUT BUFFER     CMT45350
3E46                           4536   IOSAVE   DS    2                                         CMT45360
3E48                           4537   INTSAV   DS    64                REGISTERS ON EXT/IMM INTERRUPT  CMT45370
3E88                           4538   SAVERTN  DS    2                                         CMT45380
3E8A                           4539            ORG   X'3F00'                                   CMT45390
3F00   0000 0000               4540   PSWSAVE  DCY   0,0                                       CMT45400
3F04   0000 0000
3F08                           4541   RSAVE    DS    128                                       CMT45410
3F88                           4542   RSAVE1   DS    64                                        CMT45420
3FC8                           4543   ERRSAVE  DS    64                                        CMT45430
                               4544   *                                                       CMT45440
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                         4546  **CHKSUM                                                                  CMT45460
                         4547  * START OF CHKSUM FILE                                                    CMT45470
                         4548  *                                                                         CMT45480
                         4549  *                                                                         CMT45490
                         4550  *                                                                         CMT45500
4008  2400               4551  $CHKSUM  LIS   R0,0          PUNCH M17 TAPE WITH CHECKSUM                 CMT45510
400A  9510               4552           EPSR  R1,R0          SELECT REG. SET 0                          CMT45520
                         4553  *                                                                         CMT45530
400C  C810 0A00          4554           LDAI  R1,ORIGIN1     START                                      CMT45540
4010  2421               4555           LIS   R2,1           INCREMENT                                  CMT45550
4012  C830 3639          4556           LDAI  R3,LNZB        FINAL                                      CMT45560
4016  2440               4557           LIS   R4,0           CHECKSUM BYTE                              CMT45570
4018  D351 0000          4558  $GEN     LB    R5,0(R1)                                                  CMT45580
401C  0745               4559           XAR   R4,R5                                                     CMT45590
401E  C110 4018          4560           BXLE  R1,$GEN                                                   CMT45600
4022  D240 0099          4561           STB   R4,MN+3        CHECKSUM BYTE TO BOOT LOADER               CMT45610
                         4562  *                                                                         CMT45620
4026  C810 0080          4563  $TAPE    LHI   R1,X'0080'                                                CMT45630
402A  9E21               4564           OCR   R2,R1          DISPLAY : NORMAL MODE                      CMT45640
402C  9444               4565           EXBR  R4,R4                                                     CMT45650
402E  9824               4566           WHR   R2,R4          CHECKSUM BYTE TO D1                        CMT45660
4030  9411               4567           EXBR  R1,R1                                                     CMT45670
4032  9501               4568           EPSR  R0,R1          HALT PROCESSOR.                            CMT45680


4034  D360 007A          4570  $PUNCH   LB    R6,X'7A'      GET BOUTDV (PUNCH) ADDRESS.                CMT45700
4038  DE60 007B          4571           OC    R6,X'7B'      START TAPE PUNCH                           CMT45710
403C  9D60               4572           SSR   R6,R0                                                     CMT45720
403E  2081               4573           BTBS  8,1                                                       CMT45730
4040  41E0 4082          4574           BAL   R15,$TAPL      PUNCH LEADER                               CMT45740
4044  9411               4575           EXBR  R1,R1          (R1) = X'0080'                             CMT45750
4046  C830 00CF          4576           LHI   R3,X'CF'                                                  CMT45760
404A  DA61 0000          4577  $PNCH1   WD    R6,0(R1)      PUNCH BOOT LOADER                          CMT45770
404E  9D60               4578           SSR   R6,R0                                                     CMT45780
4050  2081               4579           BTBS  8,1                                                       CMT45790
4052  C110 404A          4580           BXLE  R1,$PNCH1                                                 CMT45800
4056  41F0 4088          4581           BAL   R15,$TAPL1     PUNCH ONE-FOLD GAP.                        CMT45810
                         4582  *                                                                         CMT45820
405A  D340 0099          4583           LB    R4,MN+3        GET CHECKSUM BYTE                          CMT45830
405E  C810 0A00          4584           LDAI  R1,ORIGIN1     (NORMALLY X'A00')                          CMT45840
4062  C830 3639          4585           LDAI  R3,LNZB                                                   CMT45850
4066  D351 0000          4586  $PNCH2   LB    R5,0(R1)      PUNCH PROGRAM                              CMT45860
406A  0745               4587           XAR   R4,R5                                                     CMT45870
406C  9A65               4588           WDR   R6,R5                                                     CMT45880
406E  9401               4589           EXBR  R0,R1                                                     CMT45890
4070  9820               4590           WHR   R2,R0          DATA ADDRESS TO DISPLAY.                   CMT45900
4072  9D60               4591           SSR   R6,R0                                                     CMT45910
4074  2081               4592           BTBS  8,1                                                       CMT45920
4076  C110 4066          4593           BXLE  R1,$PNCH2                                                 CMT45930
407A  41F0 4082          4594           BAL   R15,$TAPL      PUNCH TRAILER.                             CMT45940
407E  4300 4026          4595           B     $TAPE          DISPLAY CHECKSUM, HALT PROCESSOR.          CMT45950
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CHKSUM/M17 PUNCHER

```
4082  C800 0100          4597  STAPL   LHI   R0,256      TO PUNCH BLANK LEADER          CMT45970
4086  2303               4598          BS    STAPLP                                     CMT45980
4088  C800 0055          4599  STAPL1  LHI   R0,85       TO PUNCH 1-FOLD GAP            CMT45990
408C  2701               4600  STAPLP  SIS   R0,1                                      CMT46000
408E  032F               4601          BNPR  R15         RETURN                         CMT46010
4090  2430               4602          LIS   R3,0                                       CMT46020
4092  9A63               4603          WDR   R6,R3       PUNCH BLANK FRAME              CMT46030
4094  9D68               4604          SSR   R6,R8                                      CMT46040
4096  2081               4605          BTBS  8,1                                        CMT46050
4098  2206               4606          BS    STAPLP      CONTINUE.                      CMT46060
                         4607  *                                                        CMT46070
409A                     4608          END                                            CMT46080
```

CHKSUM/M17 PUNCHEP

ASSEMBLED BY CAL 03-066R07-00 (32-BIT)

START OPTIONS: T=16,ERLST

NO CAL ERRORS
NO CAL WARNINGS
2 PASSES

```
SCHKSUM   0000 4008    4551*
SGEN      0000 4018    4558*  4560
SPNCH1    0000 404A    4577*  4580
SPNCH2    0000 4066    4586*  4593
SPUNCH    0000 4034    4570*
STAPE     0000 4026    4563*  4595
STAPL     0000 4082    4574   4594   4597*
STAPL1    0000 4088    4581   4599*
STAPLP    0000 408C    4598   4600*  4606
ABORT     0000 0E98     582*
ABSTOP    0000 409A
ADC       0000 0002     137    179    193   1086   1161   1177   1186   1198   1206   1227   1274   1288   1294
                       1313   1328   1339
ADR       0000 0D2C     443*
ADVANCE   0000 2944    3144*  3183   3199   3203
AF        0000 1590    1080   1292*
AMSG      0000 17B4     249   1494*
ASCIDEV   0000 1760     726   1481*
ASCIDEV2  0000 1770     706   1485*
ASCILOC   0000 17B4     743   1489*
ASCIPSW   0000 177A     740   1487*
ASCISTA   0000 1768     716    730   1483*
BKSP      0000 32FC    3162   3184   4286*
BKSPAC    0000 3483    1773   2069   2331   2352   2371   2691   2937   3062   3069   3109   3425   3944   4287
                       4476*
BLKMOD    0000 2922    3133   3135*
BOOT      0000 0088     103    106*
BRKRTN    0000 12DC     964    997   1002*
BRKVECT   0000 16FC     995    999   1456*
BSET      0000 2F38    1910   2010   2178   2549   2688   2863   3039   3781*
BSFIL     0000 29AC    2335   3169   3182*
BSFIL7    0000 2834    3064*  3065
BSPACE    0000 2BEC    1819   1927   2309   2562   2698   2711   3064   3424*
BSPFIL    0000 2146    2349*  2369
BTESTNO   0000 170C     519    537    554    576    612   1464*
BUFCHA16  0000 1676    1380*
BUFCHA32  0000 1694    1379   1389*
C300ADR   0000 0A18     154*
CAR2ND    0000 16F0    1444*
CARRD     0000 16E4    1436*
CARRQ2S   0000 16F8    1451*
CHAR      0000 0004      94*  1790   1791   1795   1799   1804   1809   1813   1842   2666   2670   2674   2892
                       2896   2898   2904   2927   3235   3237   3447   3449   3693   3698   3705   3707   3734
                       3989   3993   3998   4002   4026   4052   4054   4056   4058   4060   4061   4063
CHECNUM   0000 0C2A     356*
```

. CHKSUM/M17 PUNCHER

CHEKI1	0000	1A68	1621*											
CHEKI2	0000	1A0A	1587	1590*										
CHKDEL	0000	2E6A	3701*	3747										
CHKEND	0000	2B9A	2034	2725	3167	3374*	3918	3921						
CHKEND1	0000	2B96	1775	2062	2230	2272	2693	2716	2824	2833	2918	3373*	3409	
CHKEOF	0000	27F8	3045	3048*										
CIGCHK	0000	24DC	2696*	2699										
CLEAR	0000	347F	1672	1680	2310	3276	3283	3295	3314	4140	4202	4206	4472*	
CLIF2ND	0000	16EC	1442*											
CLIFADR	0000	0A14	152*											
CLIFRD	0000	16E0	1434*											
CLRDEV	0000	2B26	3310	3314*										
CMPRE	0000	18D6	1524*	2414	3075									
COMBYT	0000	2E40	3689*	3700	3746									
COMERR	0000	2EA0	3699	3717*										
COMM	0000	15A6	1285	1296	1300*	1319								
COMM1	0000	15AE	1302*	1375										
COMP1	0000	1A52	1612	1615*										
COMPAR	0000	2E34	1824	1932	2060	2416	2708	2714	3077	3685*				
COMRET	0000	0FCC	676	684*										
CON	0000	1942	427	1535*										
CON2ND	0000	16E8	214	223	224	1356	1372	1439*	1440					
CONADR	0000	16DA	220	944	965	1030	1042	1109	1189	1355	1357	1429*		
CONEIT	0000	1A9A	1632	1638*										
CONENRD	0000	16E9	1046	1440*										
CONEOF	0000	2A70	3049	3254*	3259									
CONRD	0000	16DC	221	222	941	1031	1358	1431*	1432					
CONRQ2S	0000	16F4	208	226	227	1036	1045	1447*						
CONSIX	0000	1A8E	1633*											
CONT1	0000	1A4E	1609	1613*										
CONT3	0000	223A	2418	2420*										
CONT4	0000	23CE	2576	2580*										
CONTIN	0000	17E6	589	1504*										
CONWRT	0000	16DD	1056	1373	1432*									
COUNT	0000	170E	551	565	567	1465*								
CRBUF	0000	2F62	2381	3548	3803*									
CRBUF1	0000	2F76	3810*	3812										
CRCC	0000	347A	2897	2910	2911	2915	4469*							
CRCCS	0000	347C	2908	2912	2917	4470*								
CRCERR	0000	274C	2899	2922*										
CRCTST	0000	257A	2786	2790*										
CRCZER	0000	2638	2832	2842*										
CRLF	0000	11A2	237	244	308	350	372	387	414	473	482	627	883*	953	3745
			3845	3847	3848	4013									
CRT2ND	0000	16EA	1441*											
CRTRD	0000	16DE	1433*											
CRTRQ2S	0000	16F5	1448*											
DATA	0000	1906	1528*	3973										
DATFIL	0000	3104	4013*	4022	4035									
DE	0000	3468	1705	3036	3975	3978	4460*							
DECTAB	0000	1712	1468*											
DEFTESTS	0000	1952	451	453	1538*									
DEV	0000	0006	95*	1667	1668	1669	1670	1672	1674	1675	1677	1678	1680	1711	1773

CHKSUM/M17 PUNCHER

			1777	1830	1834	1941	2029	2037	2043	2050	2069	2078	2146	2155	2167
			2191	2192	2205	2214	2215	2216	2229	2236	2237	2238	2271	2280	2293
			2294	2295	2297	2302	2310	2320	2329	2330	2331	2350	2351	2352	2371
			2378	2380	2394	2395	2395	2401	2433	2474	2475	2476	2574	2600	2685
			2691	2704	2820	2822	2829	2836	2837	2839	2840	2847	2848	2849	2874
			2881	2937	2943	3058	3062	3069	3071	3083	3096	3098	3108	3110	3112
			3158	3176	3220	3225	3243	3255	3267	3269	3276	3279	3283	3284	3288
			3295	3314	3327	3358	3359	3376	3379	3380	3403	3405	3425	3427	3473
			3514	3515	3518	3527	3576	3577	3580	3612	3619	3642	3649	3668	3669
			3874	3944	4110	4122	4133	4140	4156	4166	4196	4202	4206	4235	4244
			4251	4265	4266	4276	4277	4287	4313	4348	4370	4371	4372	4392	4395
			4411												
DEV2	0000	3474	1704	2834	2839	3361	3374	3379	4466*						
DEVADR	0000	17FE	1506*	1667	3358										
DEVCHN	0000	3440	1506	1507	4439*										
DEVICE	0000	182E	1510*	2780											
DEVINT	0000	196A	1223	1542*	2154	2166	2190	2204	2213	2235	2247	2256	2285	2327	2347
			2386	2458	2472	3140	3332	3333	4333	4335	4354	4355	4363		
DEVMSG	0000	175C	732	1480*											
DEVMSG2	0000	176C	708	1484*											
DEVONE	0000	3478	2836	2845	4468*										
DEVSADR	0000	1970	1115	1217	1543*	1660	1668	1675	2146						
DISAPM	0000	348A	1670	1678	2167	2191	2214	2229	2236	2271	2280	2329	2350	2380	2433
			2474	3327	4370	4483*	4494								
DMPLIN	0000	2FA0	3832*	3844											
DSABL	0000	3488	2192	4481*	4482										
DUBLIN	0000	2FD4	3842	3847*											
DUINT	0000	188E	1518*	2148											
DUMP	0000	2F90	1827	1935	2419	2571	3080	3826*							
DUSTER	0000	2288	2453	2467	2468*										
DV2ADR	0000	180A	1507*	1674	2837	2847	3376								
ECHO	0000	1234	937	941*	1168										
ECHO1	0000	1230	935	938*											
ECHRTN	0000	124A	943	948*											
ENABL	0000	3489	2155	2205	2215	2237	2297	2330	2351	2396	2475	4371	4482*		
END7	0000	2892	3086	3090*	3111	3116									
ENDCOMP	0000	2E94	3708	3713*											
ENDFIL	0000	26AA	2873*	2938											
ENDFIL7	0000	287E	3067	3084*	3094	3114									
ENDTST3	0000	2262	2423	2433*											
ENDTST6	0000	2738	2914*	2945											
EOF	0000	32C2	3143	3163	3254	3315	4234*								
EOFER	0000	3008	3875	3877	3880*										
EOFER01	0000	1C82	1779	1849*											
EOFER02	0000	1CC0	1836	1865*											
EOFER12	0000	1D96	1943	1965*											
EOFER21	0000	1E90	2052	2075*											
EOFLOP	0000	1F3E	2183	2189*											
EOFMRK	0000	1C5A	1832	1834*											
EOFMRK1	0000	1D46	1939	1941*											
EOT7	0000	296E	3162*	3179											
EOTFLG	0000	346A	1699	1852	1952	2066	2594	2720	2728	2934	3103	3334	3402	3492	3522
			3655	4189	4461*										

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EOTMSG	0000	17A4	592	1492*										
ERR	0000	0F4C	646*	1304										
ERR1	0000	0FE4	648	658	664	669	697*							
ERRALL	0000	0F9A	667*	1252	1262	3672								
ERRCOM	0000	0FB2	647	657	663	668	676*							
ERRCOM1	0000	0FCE	680	686*										
ERRCOM2	0000	0F58	649*	660	656	672								
ERRD	0000	0F6A	655*	2930	3710	3721								
ERRD1	0000	0FEE	659	704*										
ERRDEV	0000	16D0	705	725	1417*	1661	1669	1677	2840	2849	3359	3380	3668	
ERRDS	0000	0F82	661*	1713	2033	2228	2368	2469	2682	2707	2713	2724	2726	2730	2833
			2939	2946	3413	3431	3880	3893	4111	4142	4173	4208			
ERRDS1	0000	101E	665	670	724*	4223									
ERRDSA	0000	33F2	662	4402*											
ERRFLG	0000	346C	1701	3714	3717	3720	4462*								
ERRLVL	0000	17A0	1261	1491*											
ERRMSG	0000	1736	697	1475*											
ERRMSG2	0000	300E	1857	1861	1957	1961	2071	2081	2317	2413	2566	2596	2606	3105	3117
			3893*												
ERRNO	0000	173E	513	655	1251	1259	1284	1293	1312	1325	1477*	3671	4402		
ERROUT	0000	2C7E	3489	3494*	3563										
ERRPL1	0000	1044	671	738*	1305										
ERRS1	0000	1006	714*												
ERRSAVE	0000	3FC8	646	653	656	661	667	4543*							
ERRSTA	0000	16D2	715	729	1419*	3494	3496	3669	4219	4403					
ETESTNO	0000	173C	512	545	1476*										
FALSYN	0000	1B66	1663	1671	1679	1711*									
FILES	0000	186A	1515*	1914	3085										
FILLWBUF	0000	25BA	2808*	2812											
FIRST	0000	16C2	318	325	329	1406*									
FORFAULT	0000	1578	1082	1272*											
FOUND1	0000	0DBE	490	496	500*										
FP	0000	157E	1093	1277*											
FSTEOF	0000	2BB8	1771	1855	1909	1955	2008	2020	2193	2545	2583	2660	2689	2802	2852
			3052	3400*											
FSYNC	0000	2E12	3614	3665*	4315										
GAPDAT	0000	2516	2711*	2715											
GDHEX	0000	3174	4055	4061*											
GENFIL	0000	1C18	1815*	1828	1856	1859									
GENFIL1	0000	1D06	1923*	1956	1959										
GENFIL1A	0000	1CFE	1919	1921*											
GENFIL2	0000	1DC6	2014*	2018	2073										
GENFIL4	0000	237A	2557*	2590											
GENFIL6	0000	2694	2867*	2872	2941										
GENFIL7	0000	280E	3054*	3056											
GETCHR	0000	121C	259	409	752	765	930*	3234	3987	3996					
GETDATA	0000	30A6	3986*	3992	4012										
GFIL41	0000	237C	2558*	2572	2598										
GORD	0000	3481	2498	3201	3231	3559	4474*								
GOWRT	0000	3490	2490	3171	3485	4473*	4474								
GTDAT2	0000	30C8	3996*	4001											
HA1	0000	1BCE	1793*												
HA2	0000	1BFC	1806*												

CHKSUM/M17 PUNCHER

```
HALT9       0000 0F02    611   617*   624    691
HB1         0000 26E4   2889*
HB2         0000 2478   2668*
HEXASC      0000 1102    543   707    717    727    731    741    744    821*  2905  2925  2928
HEXASC1     0000 110C    825*  832
HEXCHK      0000 3158   3991   4000   4052*
HEXTAB      0000 171C    335   754    812    828   1260   1469*
HX1         0000 1BDE   1798*
HX2         0000 1C0E   1812*
HX3         0000 2488   2673*
HX4         0000 26F6   2895*
HY1         0000 1BE6   1797   1800*
HY2         0000 1C16   1811   1814*
HY3         0000 2490   2672   2675*
HY4         0000 26FE   2894   2897*
II          0000 15C4   1076   1311*
II32        0000 15DA   1315   1319*
INPTOP      0000 0000R
INCR        0000 16D5    603   1422*
INDATA      0000 307E   3050   3127   3973*
INEND       0000 314C   3990   4034*
INEND1      0000 310E   3999   4016*
INEND2      0000 3120   4011   4021*
INI         0000 1AC8   1607   1622   1642   1652*
INIT        0000 19A6    483   1560*
INIT.1      0000 19B2   1565*  1566
INITRET     0000 0D9A    484*  1706
INTDEV      0000 16D0   1159   1196   1213   1416*  1417
INTER31     0000 227C   2441   2446*
INTLEV      0000 1822   1509*  1695
INTLVL      0000 1966   1234   1541*  1696   1697   4448   4449   4450
INTLVLM     0000 178A   1264   1490*
INTPSW      0000 16C6   1195   1214   1408*
INTSAV      0000 3E48   1180   1187   1212   1244   4537*
INTSTA      0000 16D2   1160   1197   1418*  1419   2222   2243   2252   2261   2304   2335   2358   2403   2446
                        2451   2463   2482   4376
IO          0000 0A10    150*   197    198    206    207    213    219    480    969   1008   1022   1055   1126
                        1171   1350   1361   1366   1367   1371
IO.OK1      0000 0A76    201    203*
IO.OK2      0000 0A7C    204    206*
IO.OK3      0000 0A9A    211    216*
IOSAVE      0000 3E46    481    890   1006   1025   1053   4536*
IRGDAT      0000 1882   1517*  2709
ISITERR     0000 16FE    506    629    650    681    862    954    958   1265   1305   1457*  3731   4075   407e
                        4221   4225
JUNK1       0000 2474   2667*  2675
JUNK2       0000 24A2   2681*  2683
KBINT       0000 16FA   1169   1455*  3137   3305
KBINTO      0000 1414   1111   1124*  1190
KBINTOO     0000 144E   1145*  1149
KBINTOA     0000 1452   1139   1146*
KBINTOB     0000 143C   1128   1137*
KBINTOC     0000 142E   1132*  1135
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KBINT1 0000 145C 1125 1150*
KBINT2 0000 1486 1163 1167*
KBINT3 0000 1470 1145 1152 1158*
KBRD 0000 132E 1041* 3138
KBRD1 0000 1340 1044 1046*
KBREAD 0000 1312 930 1030*
KEEP1 0000 0DA6 489* 492
KEEP10 0000 0F10 587 625* 859
KEEP101 0000 0F36 636* 638
KEEP2 0000 0DB4 495* 498
KEEP3 0000 0DEC 518* 590 615
KEEP4 0000 0DF6 524* 578 614
KEEP41 0000 0DFA 525* 536
KEEP42 0000 0E10 529 533*
KEEP43 0000 0E16 532 535*
KEEP5 0000 0E1A 531 534 537*
KEEP6 0000 0E4E 552* 571
KEEP7 0000 0E7E 569 572*
KEEP71 0000 0E8C 573 576*
KEEP9 0000 0EC8 585 598*
KEEP91 0000 0ED6 602* 690
LAABEL 0000 35EE 1643 4513*
LABBEL 0000 35A4 1646 4509*
LABELL 0000 35C8 1649 4511*
LADC 0000 0001 555
LAST 0000 3638 1588 1619 4529*
LCORE 0000 1360 234 514 1062*
LCORE32 0000 13DC 1088 1104*
LCORE32A 0000 1404 1115* 1120
LDWT 0000 00C8 129* 132
LEADER 0000 00A2 113* 117
LEVEL 0000 3450 1509 4446*
LINK 0000 000F 93* 216 234 237 244 248 250 252 308 311 315 328 329
333 336 350 360 365 368 371 372 375 380 383 386 387
394 399 402 408 409 414 415 420 479 482 483 514 543
546 548 570 575 584 588 591 593 623 627 630 633 636
641 654 679 698 707 709 717 719 727 731 733 741 744
746 799 817 834 839 856 866 872 874 875 877 885 894
911 932 949 953 954 956 964 1016 1018 1026 1048 1099 1116
1168 1252 1262 1266 1304 1305 1644 1647 1650
LNZB 0000 3639 107 4530* 4556 4585
LOAD 0000 00AC 118* 126
LOCMSG 0000 1780 1489*
LOOK1 0000 0B64 285* 292
LOOK2 0000 0B68 287* 296
LOOK3 0000 0B78 290 293*
LOOK4 0000 0CFC 301 425*
LOOK4A 0000 0D10 428 431*
LOOK5 0000 0D24 437 439*
LOOKUP 0000 0B60 273 275 284*
LOOP 0000 17DA 568 1503*
LOOPERR 0000 2AFC 3136 3301*
LPADR 0000 0A16 153*

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LPEOF 0000 1FC6 2221 2224 2234* 2275
LPWRT 0000 16E2 1435*
LRFIFTEN 0000 2CA6 3508* 3510
LVLERR 0000 1554 1235 1258*
MACHNUM 0000 166E 1378* 1501 1502
MASK 0000 3464 1691 1791 1918 2666 2676 2793 2851 3328 3786 4003 4458*
MAXTST 0000 1950 457 1537*
MEMTOP 0000 3634 4528*
MESAGE 0000 1AA8 1616 1636 1641 1643*
MESSAG 0000 1AB2 1589 1646*
MESSAGE 0000 1ABC 1620 1649*
MICROBUS 0000 0A1A 155* 934
MIN2 0000 3430 1514 4433*
MISMATCH 0000 2DFA 3629 3634 3637 3640 3643*
MM 0000 15DE 1078 1323*
MM16 0000 1614 1341* 1342
MM32 0000 15FE 1330 1334*
MMCOM1 0000 1620 1350*
MMCOM1A 0000 162E 1352 1355*
MMCOM2 0000 1642 1354 1361*
MMCOM2A 0000 1650 1363 1366*
MMCOM3 0000 166A 1365 1369 1375*
MN 0000 0096 110* 4561 4583
MOD32 0000 16C4 181 184 356 759 768 1087 1162 1178 1199 1228 1295 1314 1329
1378 1407* 1568 3601 3625 4300 4337
MODE 0000 183A 1511* 1652 3913 3917
MODES 0000 3420 1511 4427*
MODFLG 0000 346E 1702 2281 2382 3131 3221 3308 3476 3550 3919 3922 4463*
MOVDAT1 0000 3126 4023* 4037
MOVDATA 0000 3122 4022* 4033
MOVDT1 0000 1BC0 1789* 1803
MOVDT2 0000 1BC2 1790* 1801
MOVDT3 0000 1BC6 1791* 1843
MREAD 0000 17C2 374 382 385 1501* 1570 1623 1624
MREADC 0000 16E6 1129 1153 1437*
MSET 0000 3038 3914 3916 3922*
MSG01A 0000 34BC 3725 4497*
MSG01B 0000 34CC 3727 4498*
MSG02 0000 34DC 3949 4499*
MSG03 0000 34F4 4220 4500*
MSG04 0000 3506 2269 3165 3261 4501*
MSG04A 0000 350C 3232 4502*
MSG05 0000 3512 2875 4503*
MSG06 0000 3532 2902 2906 4504*
MSG07 0000 3544 2922 2926 2931 4505*
MSG08 0000 356A 3711 3723 3894 3924 4506*
MSG09 0000 3572 3980 4507*
MSG10 0000 3580 2156 4508*
MSGPPT 0000 3186 2932 3712 3724 3726 3728 3895 3950 3981 4075*
MTDU 0000 32A0 2227 2265 2306 2360 2405 2462 2830 3226 3244 3256 3270 3280 3289
3519 3581 3650 4123 4134 4157 4167 4197 4218*
MTESTNO 0000 1732 511 542 544 1474*
MTNERR 0000 2534 2722* 2729

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MWRITE	0000	17CE	359	367	370	1383	1395	1502*	1592	1625	1625			
NBYTE	0000	3466	1802	1921	2176	2663	2677	2825	2884	3032	3329	3338	3342	3441	3687
			3757	3783	3841	4459*								
NEXTST	0000	1710	520	524	540	1466*								
NINE	0000	1B32	1687	1690*										
NOBRK	0000	1492	1171*	3304										
NOBSP	0000	22C4	2322	2471*										
NOBSP7	0000	289E	3060	3093*										
NOBYTE	0000	185E	1514*	2174	3030									
NOCOM	0000	2868	3076	3078*	3118									
NODMP1	0000	1D34	1934	1936*										
NODUMP	0000	1C46	1826	1828*										
NOERMSG	0000	1752	574	1479*										
NOERR	0000	1700	550	572	682	1458*	2788							
NOHEX	0000	317C	4053	4057	4059	4063*								
NOMSG	0000	17F2	860	1505*										
NOPRINT	0000	2722	2901	2908*	2933									
NOREAD	0000	223E	2373	2407	2421*									
NORINT	0000	1EF4	2149	2165*	2465	2470								
NORM	0000	16D4	609	1421*										
NORMAL	0000	2442	2604	2611	2614*									
NORMRET	0000	2C8C	3490	3498*	3564									
NOTEST	0000	2570	2781	2784	2787*									
NXTDEV	0000	3472	3356	3378	4465*									
NXTMOD1	0000	1CF0	1915*	1948										
NXTMOD3	0000	1F2C	2181*	2436										
NXTMOD4	0000	234A	2544*	2579										
NXTMOD7	0000	27DC	3038	3040*	3092									
OLOC	0000	16CE	742	1166	1205	1237	1301	1338	1414*	3667				
OPBSP	0000	18B2	1521*	2321	3059									
OPRD	0000	189A	1519*	2184	2372	3046	3066	3093						
OPSKIP	0000	18BE	1522*	2422										
OPSW	0000	16CA	739	1165	1204	1300	1337	1412*	3666					
OPSW32	0000	16C8	1183	1411*										
OPT	0000	17B6	284	310	351	389	1499*							
OPT555	0000	0C9E	357	391*										
OPTBUF	0000	3E40	255	256	257	270	278	289	4535*					
OPTCMD	0000	0BA4	309*											
OPTCMD1	0000	0BA6	310*	314										
OPTCMD10	0000	0CA2	393*	397										
OPTCMD11	0000	0CD2	409*	413										
OPTCMD12	0000	0CE0	405	414*										
OPTCMD2	0000	0BC8	320*	346										
OPTCMD3	0000	0BCE	322*	341										
OPTCMD4	0000	0BD4	324*											
OPTCMD5	0000	0BE6	326	329*										
OPTCMD6	0000	0BF6	331	334*										
OPTCMD7	0000	0C02	323	337*										
OPTCMD71	0000	0C14	342*											
OPTCMD8	0000	0C22	307	350*										
OPTCMD9	0000	0CA0	390	392*	418									
OPTEND	0000	192A	1532*											
OPTEND2	0000	192A	417	1531*										

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OPTIN	0000	0AF6	243*	264	411	430	441	455	475	594	642	996	1388	1402	1651
			1714	3236	3263	3317	3414	3673	4143	4209	4226				
OPTIN1	0000	0AFA	245*	421	959	1254	1267	1307							
OPTION	0000	192A	300	304	1533*										
OPTRTN	0000	0B38	306*												
OPTVAL	0000	1068	433	460	751*										
OPTVAL0	0000	106E	753*	777											
OPTVAL1	0000	1070	754*	757											
OPTVAL2	0000	107C	755	759*											
OPTVAL3	0000	108A	765*	773											
OPTVAL4	0000	10A2	767	774*											
OPTVAL5	0000	1086	760	763*											
OPTVAL6	0000	1088	762	764*											
OPTVAL7	0000	109E	769	772*											
OPTVAL8	0000	10A0	771	773*											
OPWEOF	0000	18CA	1523*	2274	3048										
OPWRT	0000	18A6	1520*	2182	3044	3087									
ORIGIN1	0000	0A00	106	135*	4554	4584									
ORIGIN2	0000	0A04	136*												
ORIGIN3	0000	0A08	139*												
ORIGIN4	0000	0A0C	140*												
OTC.	0000	11BE	893*	907											
OTC.0	0000	11C2	894*	899	908										
OTC.1	0000	11D6	897	901*											
OTC.4	0000	11FA	914*	919											
OUT0	0000	1212	895	912	915	917	924*								
OUT1	0000	1216	889	923	925*										
OUTCHR	0000	11B0	250	252	311	316	328	333	336	360	365	375	380	394	399
			408	420	636	813	856	866	872	874	885	889*	3738	3839	4064
OUTCHR2	0000	11EC	892	900	905	909*									
OUTDMP	0000	2F9E	3831*	3846											
P1	0000	113C	840	843*											
P2	0000	1162	856*	859											
P3	0000	116E	844	860*											
PASFLG	0000	16D6	228	982	1033	1043	1138	1353	1424*						
PASFLG2	0000	16D8	209	1010	1364	1425*									
PASLADR	0000	0A12	151*												
PAUSE	0000	121A	893	898	910	926*									
PAUSE0	0000	2A2A	3232*	3250											
PAUSE1	0000	2A32	3234*	3239											
PREOT	0000	2976	3164*	3229	3247										
PRIND	0000	2EDA	3718	3732*											
PRINT	0000	112A	239	548	575	593	630	698	709	719	733	746	838*	956	1266
			1644	1647	1650	2157	2270	2876	2907	3166	3233	3262	4076	4222	
PRINT2	0000	117C	861	865*	870										
PRINT3	0000	118C	868	871*	886										
PRINT3B	0000	1194	874*												
PRINT5	0000	1198	842	863	875*										
PROC00	0000	1BAE	1782*	1845	1851										
PROC01	0000	1C26	1819*	1860											
PROC02	0000	1C6C	1839*	1867											
PROC03	0000	1C38	1824*	1864											
PROC11	0000	1D14	1927*	1960											

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PROC12	0000 1D26	1932*	1964										
PROC13	0000 1D58	1946*	1967										
PROC21	0000 1DD4	2018*	2074										
PROC22	0000 1E62	2060*	2084										
PROC24	0000 1E52	2055*	2077										
PROC41	0000 238A	2562*	2599										
PROC42	0000 23A6	2569*	2609	2616									
PROC43	0000 23B0	2570	2572*										
PROC51	0000 24E4	2698*	2727										
PROC52	0000 24F8	2703*	2731										
PROC61	0000 26A2	2871*	2942										
PROC62	0000 26E0	2888*	2947										
PRREAD	0000 0C6A	373*	378										
PRWRITE	0000 0C32	358*	363										
PSW	0000 0A22	166*	2169	2195	3141	4102							
PSW2	0000 0A2A	167*	177	185	246	552	563	651	677	1095	1210	1302	3172
PSWMSG	0000 1776	745	1486*										
PSWSAVE	0000 3F00	104	1105	4540*									
PURETOP	0000 00008												
QMSG	0000 1782	955	1493*										
QUESTN	0000 1250	253	953*										
R0	0000 0000	76*	213	214	217	235	236	254	255	256	257	269	270	325
		366	369	381	384	401	451	452	453	454	480	481	487	491
		493	497	500	501	505	505	506	507	508	509	518	518	519
		520	525	526	527	530	533	541	549	549	550	551	553	564
		565	566	567	568	572	604	605	605	606	607	608	612	613
		625	625	626	631	639	645	649	649	650	652	653	655	656
		661	667	678	704	714	724	728	738	791	796	798	804	805
		816	821	822	833	838	846	847	860	862	876	883	890	891
		893	896	902	914	920	921	931	934	936	938	939	957	957
		958	963	965	966	973	974	986	987	992	998	999	1000	1008
		1009	1022	1023	1024	1030	1031	1032	1036	1041	1042	1045	1046	1047
		1055	1056	1065	1065	1066	1070	1072	1074	1111	1112	1126	1127	1151
		1165	1180	1187	1201	1204	1212	1242	1244	1302	1303	1344	1345	1346
		1560	1565	1712	2032	2225	2266	2316	2341	2367	2412	2440	2445	2466
		2468	2565	2601	2605	2612	2722	2842	2845	2848	2879	2903	2923	2929
		3131	3132	3412	3430	3486	3513	3523	3560	3575	3582	3647	3665	3665
		3666	3670	3671	3709	3719	3720	3732	3737	3739	3743	3757	3761	3765
		3837	3868	3870	3872	4102	4103	4105	4107	4108	4109	4141	4172	4207
		4379	4402	4551	4552	4568	4572	4578	4589	4590	4591	4597	4599	4600
R1	0000 0004	77*	106	118	119	121	125	175	175	176	183	183	184	185
		188	197	200	202	206	217	218	219	221	223	225	226	247
		258	258	267	270	276	278	279	284	286	291	298	300	425
		427	436	440	488	489	494	495	510	511	512	513	538	552
		553	556	557	563	564	576	577	586	589	598	599	600	601
		607	610	617	618	619	677	678	686	687	688	689	705	715
		725	729	739	742	792	795	825	841	845	849	896	898	902
		903	904	906	910	913	914	916	918	921	924	966	967	974
		975	977	978	984	987	992	993	1006	1007	1008	1009	1012	1013
		1015	1015	1017	1023	1024	1025	1043	1052	1053	1054	1055	1056	1062
		1062	1066	1067	1068	1070	1071	1074	1075	1087	1109	1110	1110	1112
		1113	1113	1115	1119	1166	1202	1205	1211	1340	1341	1366	1368	1370
		1371	1372	1373	1381	1382	1383	1390	1394	1395	1561	1566	1789	1790

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			1801	1840	1842	1915	1946	2013	2018	2024	2024	2025	2047	2055	2061
			2427	2430	2489	2497	2803	2813	2904	2924	2927	3053	3056	3063	3065
			3072	3081	3172	3173	3175	3307	3482	3483	3495	3498	3503	3517	3526
			3556	3557	3568	3579	3604	3605	3608	3609	3610	3611	3628	3633	3636
			3639	3685	3713	3713	3714	3715	3717	3730	3730	3731	3781	3792	3803
			3815	3826	3849	3979	4014	4126	4132	4132	4138	4144	4159	4165	4165
			4170	4174	4187	4195	4195	4204	4210	4299	4302	4312	4348	4372	4552
			4554	4558	4560	4563	4564	4567	4567	4568	4575	4575	4577	4580	4584
			4586	4589	4593										
R10		0000 000A	86*	1194	1194	1195	1214	1232	1233	1234	1260	1260	1261	1323	1323
			1335	1336	1785	1912	2022	2180	2555	2562	2663	2679	2694	2709	2806
			2814	2864	3030	3031	3032	3135	3144	3687	3703	3783	3805	3814	3828
			4130	4163	4193										
R11		0000 000B	87*	1787	1787	1789	1840	2159	2206	2217	2239	2248	2257	2238	2294
			2298	2332	2353	2389	2395	2397	2428	2431	2459	2477	2494	2502	3151
			3191	3215	3440	3440	3444	3447	3450	3451	3453	3488	3506	3515	3562
			3571	3577	3645	3648	3652	3654	3656	4109	4266	4277	4304		
R12		0000 000C	88*	253	268	277	288	432	435	445	462	499	758	1685	1686
			1688	1690	1691	1695	1696	1697	1698	1698	1699	1700	1701	1702	1703
			1704	1705	1815	1820	1923	1928	2014	2056	2290	2391	2429	2432	2495
			2503	2558	2563	2681	2696	2701	2706	2712	2817	2827	2867	2886	3054
			3073	3153	3193	3217	3441	3445	3448	3449	3452	3453	3493	3497	3499
			3511	3524	3530	3531	3573	3583	4305	4356	4384	4421	4426	4429	4432
			4434	4438	4445	4447									
R13		0000 000D	89*	1770	1772	1776	1829	1844	1908	1937	1947	2019	2036	2042	2049
			2068	2147	2181	2194	2220	2273	2292	2301	2319	2328	2356	2370	2377
			2381	2393	2400	2435	2473	2480	2573	2578	2684	2690	2703	2819	2873
			2932	2936	3029	3051	3057	3061	3068	3070	3082	3091	3095	3097	3107
			3109	3219	3266	3278	3330	3424	3426	3472	3507	3509	3525	3548	3549
			3641	3712	3724	3726	3728	3816	3873	3895	3926	3943	3950	3981	3991
			4000	4062	4065	4080	4125	4145	4158	4175	4211	4234	4243	4253	4264
			4275	4286	4298	4336	4369	4391	4394	4410	4412				
R14		0000 000E	90*	307	343	433	436	438	460	465	469	775	778	784	1277
			1297	1300	1316	1326	1331	1334	1336	1337	1768	1769	1771	1774	1778
			1786	1819	1824	1827	1835	1849	1852	1855	1857	1858	1861	1862	1865
			1906	1907	1909	1910	1922	1927	1932	1935	1942	1952	1955	1957	1958
			1961	1962	1965	2005	2006	2008	2009	2010	2020	2038	2044	2051	2060
			2066	2071	2072	2075	2081	2082	2144	2145	2160	2177	2178	2193	2207
			2218	2240	2249	2258	2299	2309	2317	2333	2354	2398	2413	2416	2419
			2460	2478	2542	2543	2545	2548	2549	2562	2566	2567	2571	2583	2584
			2594	2596	2597	2606	2607	2657	2658	2660	2664	2687	2688	2689	2692
			2698	2700	2708	2711	2714	2791	2794	2795	2802	2823	2852	2853	2862
			2863	2871	2882	2940	3027	3028	3035	3036	3037	3039	3050	3052	3064
			3077	3080	3103	3105	3117	3127	3143	3157	3162	3163	3164	3174	3184
			3197	3202	3224	3242	3254	3260	3268	3277	3287	3315	3316	3345	3362
			3400	3408	3410	3411	3429	3432	3455	3716	3770	3793	3850	3879	3881
			3896	3946	3952	3974	3975	4015	4105	4112	4236	4245	4267	4278	4288
			4320	4350	4373	4393	4395								
R15		0000 000F	92*	239	259	438	444	485	485	486	752	753	754	756	764
			765	813	889	995	997	1278	1298	1301	1317	1327	1332	1338	1378
			1568	1590	1590	1621	1621	1713	1793	1794	1806	1807	2033	2157	2158
			2228	2270	2286	2287	2288	2289	2290	2291	2368	2387	2388	2389	2390
			2391	2392	2469	2550	2551	2552	2553	2554	2585	2586	2587	2588	2589

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		2668	2669	2670	2682	2707	2713	2720	2723	2724	2726	2728	2730	2796
		2797	2798	2799	2800	2808	2809	2810	2811	2843	2854	2855	2856	2857
		2858	2876	2889	2890	2891	2892	2905	2907	2925	2928	2930	2934	2939
		2946	3138	3149	3150	3151	3152	3153	3154	3166	3189	3190	3191	3192
		3193	3194	3213	3214	3215	3216	3217	3218	3233	3234	3262	3271	3290
		3335	3336	3337	3338	3339	3340	3341	3342	3343	3344	3378	3381	3413
		3431	3442	3443	3444	3445	3446	3504	3505	3506	3508	3511	3512	3569
		3570	3571	3572	3573	3574	3578	3614	3667	3672	3689	3690	3691	3692
		3693	3694	3695	3696	3697	3701	3702	3703	3704	3705	3706	3710	3721
		3733	3738	3744	3745	3758	3759	3760	3762	3763	3764	3765	3767	3768
		3769	3787	3788	3789	3790	3804	3805	3808	3809	3811	3832	3833	3834
		3835	3836	3838	3839	3840	3845	3847	3848	3880	3893	3925	3945	3951
		3982	3987	3996	4004	4005	4006	4007	4008	4013	4016	4017	4018	4019
		4020	4023	4024	4025	4026	4027	4028	4029	4030	4031	4064	4076	4079
		4104	4106	4111	4137	4142	4169	4173	4203	4209	4222	4254	4315	4429
		4423	4425	4428	4431	4437	4444	4451	4574	4581	4594	4601		
R2	0000 0002	78*	102	122	128	177	178	180	181	187	189	198	203	205
		207	208	212	213	214	221	222	223	224	231	231	232	246
		247	304	305	309	309	310	312	313	319	322	344	351	389
		393	395	400	416	417	524	527	528	535	537	538	539	540
		542	544	545	554	555	556	602	603	606	608	609	619	647
		651	652	657	663	668	676	681	682	706	716	726	730	740
		743	793	905	806	808	810	814	829	830	843	969	970	973
		982	986	989	989	1063	1115	1117	1117	1118	1129	1130	1132	1133
		1140	1141	1146	1153	1154	1156	1159	1167	1171	1172	1188	1189	1196
		1210	1211	1213	1219	1272	1283	1284	1292	1293	1295	1303	1311	1312
		1314	1324	1325	1329	1346	1350	1351	1353	1355	1356	1357	1358	1359
		1361	1362	1364	1367	1368	1371	1372	1373	1563	1782	1800	1913	2011
		2490	2498	2902	2922	2926	3033	3170	3200	3240	3301	3306	3307	3484
		3558	3612	3621	3651	3736	3736	3740	3741	3829	3829	3834	3841	3843
		3985	3985	4009	4010	4021	4021	4025	4032	4034	4034	4036	4036	4127
		4129	4160	4162	4190	4192	4313	4349	4555	4564	4566	4590		
R3	0000 0003	79*	107	108	109	199	200	203	219	220	232	285	285	289
		293	295	306	319	344	392	396	466	470	634	637	782	785
		785	794	822	823	824	826	831	855	857	1064	1069	1073	1076
		1077	1080	1081	1082	1083	1093	1094	1107	1108	1114	1118	1124	1130
		1133	1134	1141	1146	1147	1154	1160	1188	1197	1564	1783	1841	1914
		2012	2023	2025	2027	2048	2491	2499	2825	2884	2890	2896	3034	3171
		3201	3241	3485	3559	3615	4128	4161	4191	4316	4340	4341	4344	4345
		4346	4347	4556	4576	4585	4602	4603						
R4	0000 0004	80*	111	112	113	115	123	125	226	227	228	229	229	249
		251	260	262	263	265	272	274	278	310	315	320	321	324
		327	332	334	335	335	337	338	339	340	359	364	374	379
		393	398	407	410	412	419	431	434	449	471	635	754	766
		774	776	809	810	811	812	812	825	826	827	828	828	829
		851	851	852	853	854	865	867	871	873	884	920	930	931
		936	938	939	947	948	1035	1037	1078	1079	1085	1092	1104	1105
		1106	1132	1140	1143	1143	1156	1162	1167	1172	1562	1565	1567	1767
		1905	2004	2143	2169	2170	2172	2173	2195	2196	2198	2199	2492	2500
		2541	2656	2790	3026	3136	3137	3141	3142	3173	3175	3301	3302	3304
		3305	3356	3487	3561	3647	3735	3830	3973	3975	3977	3978	4355	4557
		4559	4561	4565	4565	4566	4583	4587						
R5	0000 0005	81*	113	115	116	116	118	119	120	123	125	131	238	287

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			289	317	317	318	330	330	342	342	345	356	358	358	359
			361	362	367	370	373	373	374	376	377	382	385	400	457
			461	547	574	592	628	629	632	640	697	708	718	732	745
			809	865	869	955	1095	1096	1097	1098	1138	1199	1207	1207	1216
			1216	1217	1221	1223	1231	1234	1264	1265	1643	1646	1649	1652	1654
			1780	1780	1781	1817	1817	1818	1822	1822	1823	1825	1837	1837	1838
			1917	1918	1920	1921	1925	1925	1926	1930	1930	1931	1933	1944	1944
			1945	2016	2016	2017	2053	2053	2054	2058	2058	2059	2149	2153	2154
			2155	2165	2166	2170	2173	2174	2175	2176	2182	2184	2189	2190	2196
			2199	2203	2204	2212	2213	2234	2235	2246	2247	2255	2256	2269	2274
			2281	2282	2284	2285	2321	2326	2327	2346	2347	2372	2382	2383	2385
			2385	2414	2417	2422	2457	2458	2471	2472	2493	2501	2546	2546	2547
			2560	2560	2561	2569	2575	2580	2581	2614	2614	2615	2675	2677	2723
			2780	2782	2783	2785	2787	2788	2792	2793	2807	2810	2834	2850	2851
			2859	2869	2869	2870	2875	2877	2878	2879	2897	2898	2906	2908	2909
			2909	2910	2911	2912	2914	2915	2916	2917	2924	2931	3041	3044	3046
			3048	3059	3066	3075	3078	3087	3093	3123	3125	3128	3129	3130	3130
			3134	3135	3139	3140	3142	3165	3221	3222	3232	3261	3308	3309	3328
			3329	3331	3331	3332	3333	3334	3360	3360	3361	3374	3401	3401	3402
			3476	3477	3550	3551	3601	3625	3627	3628	3632	3633	3635	3636	3638
			3639	3696	3698	3711	3722	3723	3725	3727	3729	3734	3760	3761	3762
			3765	3766	3767	3785	3786	3789	3807	3807	3810	3813	3814	3835	3894
			3913	3915	3917	3919	3920	3922	3923	3924	3938	3939	3941	3942	3947
			3947	3948	3949	3980	3993	3994	4002	4003	4007	4019	4029	4075	4077
			4077	4078	4103	4108	4188	4188	4189	4220	4221	4224	4224	4225	4333
			4334	4334	4335	4337	4353	4353	4354	4367	4368	4441	4441	4558	4559
			4586	4587	4588										
R5HEX	0000	10DA	368	371	383	386	402	633	641	804*	3733	3744	3838		
R5X	0000	10E6	809*	815											
R5XA	0000	10F4	813*												
R5XB	0000	10FC	807	816*											
R6	0000	0006	82*	110	120	127	208	209	210	210	286	287	294	388	391
			403	404	406	406	440	443	461	463	468	751	751	761	764
			770	783	786	1217	1219	1223	1225	1228	1237	1238	1240	1250	1251
			1258	1259	1382	1385	1387	1389	1393	1394	1398	1401	1570	1571	1571
			1573	1574	1574	1576	1577	1579	1581	1581	1583	1584	1586	1588	1608
			1611	1613	1623	1627	4419	4422	4424	4427	4430	4433	4436	4439	4439
			4443	4446	4448	4449	4450	4570	4571	4572	4577	4578	4588	4591	4603
			4604												
R7	0000	0007	83*	129	130	131	458	466	473	1380	1380	1381	1389	1390	1397
			1400	1610	1611	1613	1614	1615	1624	1633	1638				
R8	0000	0008	84*	121	122	127	128	459	470	474	1010	1625	1629	1788	1788
			1792	1794	1795	1796	1798	1799	1800	1802	1805	1807	1808	1809	1810
			1812	1813	1814	1828	1839	1839	1916	1917	1936	2035	2035	2040	2041
			2041	2046	2279	2318	2348	2369	2379	2420	2557	2572	2665	2665	2667
			2669	2671	2673	2674	2675	2680	2680	2683	2695	2695	2699	2710	2710
			2715	2804	2809	2812	2816	2826	2826	2866	2872	2885	2885	2888	2893
			2895	2900	2913	3043	3043	3084	3085	3144	3155	3168	3182	3195	3198
			3688	3688	3692	3695	3700	3746	3784	3784	3785	3788	3791	3809	3810
			3812	3831	3831	3844	3984	3984	3986	3988	3995	3997	4006	4012	4018
			4022	4028	4131	4131	4139	4164	4164	4171	4194	4194	4205	4366	4366
			4331	4382	4604										
R9	0000	0009	85*	759	768	941	942	944	945	947	1033	1169	1170	1178	1580

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			1592	1593	1593	1595	1596	1596	1598	1599	1601	1603	1603	1605	1606
			1608	1610	1614	1617	1619	1626	1784	1911	2021	2179	2556	2661	2678
			2805	2815	2865	3686	3782	3806	3827	3983	4129	4162	4192	4300	
RABEND	0000	2D52	3579*	3622											
RADDRS	0000	3630	1385	1397	1398	1573	1577	1579	1584	3340	4527*				
RBUFF	0000	3A3A	1576	1583	1586	1813	2896	4532*							
RCONLY	0000	26C2	2860	2880*											
RCOVR	0000	1CA0	1853	1857*											
RCOVR1	0000	1D76	1953	1957*											
RCOVR2	0000	1E80	2067	2071*											
RCOVR6	0000	2788	2935	2939*											
RDBLK	0000	32F0	3197	3224	4275*										
RDBMD	0000	2D2C	3552	3568*											
RDCHAR0	0000	0B26	261	263*											
RDCHR	0000	0B18	259*	271	280										
RDCHR1	0000	0B44	266	272*											
RDCON	0000	29E8	3126	3213*	3238										
RDCONB	0000	2A10	3224*	3231											
RDCONS	0000	2A48	3223	3240*	3249										
RDCRC	0000	18EE	1526*	2859											
RDEND	0000	2226	2411	2414*											
RDER0	0000	1CB0	1821	1861*											
RDER1	0000	1D86	1929	1961*											
RDER21	0000	1E9C	2057	2078*											
RDER4	0000	2410	2564	2600*											
RDER6	0000	2798	2887	2943*											
RDER71	0000	28DC	3074	3112*											
RDFIL6	0000	26D8	2886*	2913											
RDFIL7	0000	2854	3072*	3089											
RDON	0000	2872	3079	3081*											
RDONLY	0000	21A4	2185	2377*											
RDREC	0000	2CF4	1820	1928	2056	2563	2706	2712	2827	2886	3073	3548*			
READ	0000	3484	1777	2050	2378	2394	2497	2822	3071	3083	3200	3220	3240	3267	3558
			3576	4276	4477*	4478									
RECFIL	0000	1852	1513*	1785	1912	2012	2048	2180	2555	2864	3034				
REOF01	0000	1B98	1776*	1850											
REOF21	0000	1E3C	2049*	2076											
REPEAT	0000	1876	1516*	2023											
REPEAT0	0000	1DF0	2026	2028*											
RERD2	0000	1E6A	2039	2045	2062*	2080									
RERDR	0000	1C2A	1820*	1863											
RERDR1	0000	1D18	1928*	1963											
RERDR21	0000	1E54	2056*	2061	2083										
RERDR4	0000	238E	2563*	2568	2608										
RERDR7	0000	2856	3073*	3081											
RESET	0000	2F0E	1786	1922	2009	2177	2548	2584	2664	2687	2795	2853	3035	3757*	
RET	0000	000E	91*	648	658	659	662	664	665	669	670	671	700	710	720
			734	747	1306	1673	1681	1833	1854	1940	1954	2007	2028	2168	2421
			2434	2544	2577	2582	2659	2686	2705	2801	2821	2833	2861	2880	3040
			3090	3373	4223	4404	4413								
RETOPSW	0000	1498	1136	1144	1157	1176*	1455	3119	3303						
RETOPSW1	0000	14A6	1179	1183*											
RETRY	0000	304A	1849	1858	1862	1865	1958	1962	1965	2072	2075	2082	2567	2597	2607

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			2940	3938*										
REVRS	0000	2AB8	3277*	3282										
REVRS1	0000	2ADA	3287*	3292	3294									
REWD	0000	3482	2216	2476	4244	4411	4475*	4476						
REWIND	0000	33FC	1673	1681	1833	1854	1940	1954	2007	2028	2168	2421	2434	2544	2577
			2582	2659	2686	2705	2801	2821	2833	2861	2880	3040	3090	3373	4410*
RFILB	0000	29B6	3189*											
RFILS	0000	29D2	3196	3198*										
RINI	0000	1A40	1600	1602	1607*	1618								
RINI2	0000	1AA4	1637	1642*										
RLIM	0000	3620	1806	2388	2390	2499	2586	2588	2797	2799	2855	2857	2889	3190	3192
			3214	3216	3341	3343	3557	3570	3572	3691	3702	3764	3768	3804	3808
			3833	4523*											
RONLY7	0000	284C	3047	3070*	3099										
ROPTIN	0000	1AC4	1645	1648	1651*										
ROPTIN1	0000	16BE	1399	1402*											
ROPTIN2	0000	1690	1386	1388*											
RP	0000	1586	1107	1273	1283*										
RREC3	0000	21AE	2380*	2420											
RSAV32	0000	3628	2286	2291	2387	2392	2550	2554	2585	2589	2796	2800	2854	2858	3149
			3154	3189	3194	3213	3218	3335	3344	3442	3446	3504	3512	3569	3574
			3690	3697	3701	3706	3758	3769	3832	3836	4004	4008	4016	4020	4023
			4030	4525*											
RSAVE	0000	3F08	105	791	798	804	816	821	833	838	876	883	963	1000	1041
			1047	1085	1242	3482	3495	3498	3503	3517	3526	3556	3568	3579	3737
			3739	3986	3988	3995	3997	4541*							
RSAVE1	0000	3F88	1792	1796	1798	1805	1810	1812	2667	2671	2673	2803	2813	2888	2893
			2895	3685	3715	3781	3792	3803	3815	3826	3849	3979	4014	4126	4144
			4159	4174	4187	4210	4299	4302	4308	4309	4310	4311	4312	4542*	
RSTORE	0000	1686	1385*												
RSTORE1	0000	16AC	1397*												
RTN01	0000	1F7C	2203	2212*											
RTN02	0000	1FA2	2212	2222*											
RTN03	0000	1FE8	2234	2243*											
RTN04	0000	200A	2246	2252*											
RTN05	0000	202C	2255	2261*											
RTN06A	0000	203A	2284	2303	2304*	2492									
RTN07	0000	2124	2326	2336*											
RTN08	0000	2168	2346	2358*											
RTN09A	0000	21FE	2385	2402	2403*	2500									
RTN10	0000	22EE	2471	2482*											
RTN11	0000	33C0	4367	4376*											
RTNDSR	0000	2278	2189	2445*											
RTNDSM	0000	2272	2165	2440*											
RTNDU1	0000	2284	2153	2451*											
RTNDU2	0000	22A6	2457	2463*											
RTICNT	0000	3470	1700	1781	1818	1823	1838	1926	1931	1945	2017	2054	2059	2561	2615
			2870	3938	3942	3948	4464*								
RTIFAIL	0000	3068	3940	3947*											
RUN	0000	1936	298	1534*											
RUNIT	0000	0D86	299	478*											
RWCOM	0000	2DAC	3620	3624*											
RWCOM32	0000	2DC4	3626	3631*											

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RWMOD32	0000 2D76	3602	3607*										
RWND	0000 32CC	3164	3260	3316	4243*								
RWREC	0000 2D62	3488	3562	3601*									
RWREC.A	0000 2D92	3613	3615*										
RWREC1	0000 2D8A	3606	3512*										
RWREC2	0000 2DF6	3644	3647*										
RWREC3	0000 2CF2	3529	3531*										
RWSEL	0000 3306	3174	3202	3242	4298*								
RWSEL.A	0000 3344	4314	4316*										
RWSEL.B	0000 333C	4306	4313*										
RWSEL32	0000 3324	4301	4307*										
RWTRM	0000 2DE4	3630	3641*										
RWTRM1	0000 2CDC	3516	3525*	3578									
SAVERTN	0000 3E88	3400	3410	4538*									
SCLOOP	0000 28FA	3042	3123*										
SCOP	0000 3448	1529	4443*										
SCOPE	0000 1912	1529*	3041	3128									
SCRC	0000 18E2	1525*	2785										
SDUMP	0000 18FA	1527*	1825	1933	2417	2563	3078						
SECDEV	0000 2614	2833*	2844										
SELADR	0000 1816	1508*	1659	3357									
SELCH	0000 0007	97*	1659	1660	1661	1662	3311	3313	3357	3603	3604	3605	3607	3608
		3609	3610	3611	3615	3616	3618	3624	3627	3631	3632	3635	3638	4218
		4303	4304	4305	4307	4308	4309	4310	4311	4316	4317	4319	4339	4340
		4341	4343	4344	4345	4346	4347	4349	4352					
SELCHK	0000 1AD4	1653	1659*											
SELINR	0000 231E	2384	2497*											
SELINT	0000 3350	2495	2503	4333*										
SELINT1	0000 3390	2493	2501	4352*										
SELINW	0000 22FE	2283	2489*											
SELTST	0000 1702	501	577	613	1459*									
SENEOF	0000 2FF2	3869	3871	3873*										
SENMTN	0000 32D6	3219	3266	3278	4234	4243	4251*	4255	4264	4275	4286	4298	4331	4394
SENS01	0000 2FE2	1835	1942	3408	3868*									
SENS02	0000 2FE8	1778	2051	2823	2882	3870*								
SENS03	0000 2FEE	1774	2038	2044	2692	3872*								
SET.RTN	0000 135E	1052	1058*											
SETDEV	0000 1AF8	1655	1667*											
SETKB	0000 1304	216	248	591	1022*									
SETMOD	0000 301C	3330	3313*											
SETMSK	0000 1B34	1689	1691*											
SETTRK	0000 1B22	1676	1685*											
SETUP	0000 134A	913	1052*											
SETWBUF	0000 2F44	3785*	3791											
SINK	0000 16D3	945	1032	1353	1420*									
SKEW	0000 33DE	3268	4391*											
SKIPF	0000 3486	2037	2427	2881	4392	4479*	4480							
SKIPINT	0000 33A0	2429	2432	4366*										
SKIPINT1	0000 33AA	4369*	4393											
SKIPR	0000 3487	2043	2430	3096	3098	4395	4480*							
SKPCON	0000 2A92	3124	3269*	3285	3296									
SKPCON1	0000 2A9A	3268*	3273	3275										
SKPFOR	0000 1E0A	2036*	2040											

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SKPFWD	0000 1E08	2031 2035* 2047
SKPRVS	0000 1E20	2042* 2046
SKRV	0000 33E8	3277 3287 4394*
SLCHINT	0000 28F6	3113* 3139
SPACE8	0000 2EE8	3737* 3742
SQMASK	0000 34B6	3135 4496*
ST	0000 0A50	182 187*
STA03	0000 1FF4	2286*
STA04	0000 2016	2255*
STA05	0000 2060	2263 2274*
STA05A	0000 205C	2242 2251 2260 2273*
STA06	0000 20A4	2297* 2496
STA06A	0000 20EA	2315 2318*
STA07	0000 213C	2338 2340 2346*
STA08	0000 2190	2357 2366 2369*
STA09	0000 21E8	2396* 2504
STA11	0000 33D2	4375 4378 4381*
STAERR	0000 1FB2	2225* 2268 2342 4380
STAERR1	0000 2038	2245 2254 2264*
STAMSG	0000 1764	718 1482*
START	0000 0A66	187 197*
START1	0000 0A30	135 175* 192
START2	0000 0A46	138 183* 194
START3	0000 0A5E	139 192*
START4	0000 0A62	140 194*
STAT	0000 0005	95* 1711 1830 1831 1938 2029 2030 2078 2079 2222 2223 2226 2243
		2244 2252 2253 2261 2262 2264 2267 2295 2302 2304 2305 2307 2312
		2314 2336 2337 2339 2358 2359 2361 2363 2365 2401 2403 2404 2406
		2408 2410 2446 2451 2452 2463 2464 2482 2483 2600 2603 2610 2829
		2831 2943 2944 3112 3113 3115 3158 3160 3176 3178 3225 3228 3230
		3243 3246 3248 3255 3258 3269 3272 3274 3279 3281 3284 3285 3288
		3291 3293 3311 3405 3406 3427 3428 3448 3450 3473 3474 3492 3494
		3496 3518 3520 3522 3527 3528 3580 3616 3619 3642 3643 3649 3653
		3655 3874 3876 3878 4110 4122 4124 4133 4135 4156 4165 4196 4198
		4200 4219 4251 4252 4317 4376 4377 4403
STER02	0000 1FAE	2225* 2484
STER06A	0000 20E2	2313 2316*
STER08	0000 2188	2364 2367*
STER09A	0000 221E	2409 2412*
STERR2	0000 1FBA	2228* 2447
STOP	0000 347E	1662 3313 3603 3618 3624 4218 4303 4319 4339 4352 4471* 4472
STOP2	0000 3614	3607 3631 4307 4343 4519*
SWAP	0000 2C0A	2700 2871 3440*
SWP1	0000 2C20	3447* 3454
TAPEND	0000 1DD8	2019* 2070
TAPEND4	0000 23BC	2575* 2595
TELAST	0000 19FC	1575 1582 1586*
TELAST0	0000 1A2E	1585 1591 1601*
TELAST1	0000 1A5A	1597 1617*
TEMP	0000 3E3C	321 324 334 337 339 3722 3729 4533*
TEST	0000 17B6	306 425 452 454 473 474 488 494 530 533 1500*
TEST0	0000 1B74	1539 1767*
TEST01	0000 1B7C	1767 1769*

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TEST1	0000	1CCC	1539	1905*										
TEST11	0000	1CD4	1905	1907*										
TEST2	0000	1DA2	1539	2004*										
TEST21	0000	1DAA	2004	2006*										
TEST3	0000	1EB6	1539	2143*										
TEST31	0000	1EBE	2143	2145*										
TEST4	0000	233E	1540	2541*										
TEST41	0000	2346	2541	2543*										
TEST5	0000	244C	1540	2656*										
TEST51	0000	2454	2656	2658*										
TEST6	0000	255A	1540	2780*										
TEST61	0000	2582	2792*	2841										
TEST62	0000	2644	2835	2838	2845*									
TEST63	0000	2656	2790	2846	2850*									
TEST7	0000	27AA	1540	3026*										
TEST71	0000	27B2	3026	3028*										
TESTAA	0000	1A6E	1594	1623*										
TESTAA0	0000	19CE	1573*											
TESTAA1	0000	1A10	1572	1578	1592*									
TESTAA2	0000	19C4	1570*											
TESTAB	0000	19E4	1569	1579*										
TESTAB1	0000	1A44	1604	1608*										
TESTOP	0000	0D34	426	449*										
TESTS	0000	1956	556	1539*										
TIME	0000	0A1E	164*	794	1567	4128	4161							
TIMEOUT	0000	319A	2160	2207	2218	2240	2249	2258	2299	2333	2354	2398	2460	2478	4102*
			4350	4373										
TIMER	0000	10C0	791*	797	1238	4106								
TIMVAL	0000	191E	1530*	1560										
TIMXT	0000	19D8	799*	1240										
TITLE	0000	1978	238	1544*										
TOTAL	0000	1708	507	599	601	632	1462*							
TOTERR	0000	170A	508	604	640	686	688	1463*						
TOTMSG	0000	1742	628	1478*										
TRACK	0000	1846	1512*	1685	2782									
TRACKS	0000	3412	1512	4422*										
TRYDUM	0000	2230	2415	2417*										
TRYRD	0000	219C	2362	2372*	2481	2485								
TSA	0000	2B70	3342*											
TSB	0000	2B60	3338*											
TSLONGA	0000	2B58	3336*											
TSLONGB	0000	2B68	3340*											
TSTBRK	0000	126A	415	546	570	588	875	963*	2158	2811	3271	3290	3689	3730	3811
			3840	3925	3945	3951	3982	4031	4079	4104	4137	4169	4203	4254	
TSTBRK1	0000	12BC	983	992*										
TSTBRK2	0000	12C4	976	991	995*									
TSTBRK3	0000	12D0	968	985	990	998*								
TSTBRK4	0000	12A2	971	981*										
TSTBRK5	0000	128A	972*	980										
TSTBRK5A	0000	128C	974*											
TSTDU	0000	12DE	584	623	679	839	894	911	1006*					
TSTDU1	0000	12FE	1011	1014	1017*									
TSTEND	0000	0E60	562*	2789	3375	3377								

CHKSUM/M17 PUNCHER

TSTINIT	0000 2B36	1769	1907	2006	2145	2543	2658	2794	2852	3028	3327*			
TSTMOD	0000 3026	1844	1947	2435	2578	3091	3917*							
TSTMSG	0000 172C	547	1473*											
TSTOP1	0000 0D4C	450	457*											
TSTOP2	0000 0D54	460*	472											
TSTOP3	0000 0D6A	464	468*											
TSTOP4	0000 0D74	467	471*											
TSTSUP	0000 2B7E	1768	1906	2005	2144	2542	2657	2791	3027	3356*				
TTYGET	0000 1326	1035*												
UNARY	0000 1082	465	469	782*										
UNARY1	0000 1084	783*	787											
VARFIL	0000 1CF2	1916*	1946											
VARREC	0000 1CF4	1917*	1936											
W1EXIT	0000 329A	4199	4210*											
W2EXIT	0000 3206	4136	4144*											
W3EXIT	0000 3246	4168	4174*											
WABEND	0000 2CC2	3517*	3623											
WADDRS	0000 362C	1387	1400	1401	1580	1595	1599	1606	3336	4526*				
WAIT1	0000 324C	1770	1908	2147	2181	2220	2480	3029	4187*	4410	4412			
WAIT2	0000 31BE	1772	1776	1829	1937	2019	2035	2042	2049	2068	2194	2273	2292	2319
		2328	2349	2370	2377	2393	2473	2573	2684	2690	2703	2819	2873	2936
		3051	3057	3061	3068	3070	3082	3095	3097	3107	3109	3424	3472	3549
		3943	4122*	4336	4369									
WAIT3	0000 320C	2301	2356	2400	3426	3525	3641	3873	4156*					
WASDU	0000 1704	236	509	598	626	841	843	852	924	1460*				
WASDU1	0000 1706	486	586	854	1461*									
WBUFF	0000 363A	1598	1601	1605	1617	1799	2674	4531*						
WCON7	0000 2816	3056*	3106											
WDATA	0000 348C	1790	1842	4485*										
WEOF	0000 348B	1834	1941	2238	2320	2574	2685	2704	2820	2874	3058	3110	3403	4235
		4484*												
WEOF02	0000 1C4A	1829*	1866											
WEOF12	0000 1D38	1937*	1966											
WEOT	0000 2C78	3475	3492*											
WEOT7	0000 28C8	3104	3107*											
WER51	0000 2542	2721	2726*											
WERLS	0000 2426	2606*	2613											
WFILB	0000 295A	3155*												
WFILS	0000 2986	3156	3161	3168*										
WLIN	0000 3618	1793	2287	2289	2491	2551	2553	2668	2808	3150	3152	3337	3339	3443
		3483	3505	3508	3694	3759	3763	3787	4005	4017	4024	4027	4521*	
WLRS	0000 3476	1703	2547	2575	2581	2601	4467*							
WREC3	0000 206A	2280*	2318											
WRITE	0000 3485	2293	2489	3170	3484	3514	4265	4478*						
WRTBLK	0000 32E4	3157	4264*											
WRTBMD	0000 2C94	3478	3503*											
WRTEND	0000 20EE	2311	2319*											
WRTER0	0000 1C8E	1816	1852*											
WRTER1	0000 1D64	1924	1952*											
WRTER2	0000 1E6E	2015	2066*											
WRTER4	0000 23F8	2559	2594*											
WRTER51	0000 252E	2697	2720*											
WRTER52	0000 254A	2702	2728*											