Program Number B06-134R05

COMMON
EIGHT LINE INTERRUPT
MODULE TEST

CONSISTS OF:

PROGRAM DESCRIPTION	B06-134M95R04A15
TEST PROGRAM PAPER TAPE	06-134M17R04
PROGRAM LISTING	06-134R04M96A13

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COMMON EIGHT-LINE INTERRUPT MODULE TEST PROGRAM DESCRIPTION

COMMON EIGHT-LINE INTERRUPT MODULE TEST

Related Documents

Test Program Listing	06-134M96R04A13
Test Program Paper Tape	06-134M17R04

M48-001 Eight-Line Interrupt
Module Instruction Manual 29-268 Consisting of:

Installation Spec.	02-237A20
Maintenance Spec.	02-237A21
Programming Spec.	02-237A22
Application Spec.	02-237A24
Schematic	02-237D08

Test Programs to be run prior to loading this test:

For 16 Bit Processors

Memory Test	06-003
Series 16 Processor Test	06-106
5/16 Processor Test Part 1	06-215
5/16 Processor Test Part 2	06-216
8/16 Processor Test Part 1	06-209
8/16 Processor Test Part 2	06-210
8/16E Processor Test Part 1	06-211
8/16E Processor Test Part 2	06-212

For 32 Bit Processors

Series 32 Basic Test	06-158
Series 32 Processor Test	
Part 1	06-154
Part 2	06-155
Part 3	06-178
Series 32 Memory Test	06-156

Other Test Programs

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

PURPOSE OF TEST

The Common Eight-Line Interrupt Module Test verifies the operation of the Eight-Line Interrupt Module (M48-001), and assists maintenance personnel in testing and troubleshooting.

The program tests the clear command; disable interrupt function; operation of the mask function; operation of the reset function; external interrupt inputs; and operation of the set interrupt function. Options are available for flexibility in testing.

Test Sequence

1. Test 0

   This test verifies that no interrupts occur after a CLEAR command.

2. Test 1

   This test verifies that interrupts do not occur while disabled. It also verifies that interrupts may be prevented by masking.

3. Test 2

   This test verifies that a single interrupt occurs for each line set, when all interrupts are masked and enabled, and each line is set individually.

4. Test 3

   This test verifies that when all interrupts are enabled and set, and each interrupt is masked individually, only the masked line generates an interrupt.

5. Test 4

   This test verifies that when all interrupts are set and masked, and each interrupt is reset individually, all lines, except the one reset, cause an interrupt.

6. Test 5

   This test verifies the function of the External Interrupt Lines attached to the Eight-Line Interrupt Module.

MINIMUM HARDWARE

The following is a list of hardware required, as a minimum, to perform this test.

1. Processor - Model 7/16 Basic or equivalent, or
   Model 7/32 or equivalent

2. Minimum Memory - 16K Bytes

3. Console Input Device (see Appendix 1)
   Teletype or CRT/Carousel on PASLA

4. List Device (see Appendix 1)
   Teletype, CRT/Carousel on PASLA or Line Printer

5. Paper Tape Reader
   Teletype or High Speed Paper Tape Reader

6. Eight Line Interrupt Module (M48-001)

REQUIREMENTS OF MACHINE UNDER TEST

This program assumes that the programs listed in the 'Test Programs' section have been run without the detection of an error.

Device Addresses

The Eight-Line Interrupt Module should be strapped for device addresses X'20' - X'27'. If the addresses are different, the DEVADR option must be entered. Refer to Appendices 2 and 3.

Hardware Changes

Before loading the test program ensure that cable 17-170 is removed from Connector 'A' at the front of the 35-397 7" board (Eight Line Interrupt Module).

LOADING PROCEDURE

Test Tape Format

Absolute, non-zoned object tape (M17) with front end bootloader. The test program occupies memory from X'A00' through X'2269'.

Normal Loading Procedure

1. Manually enter the X'50' sequence shown below, into memory.

LOCATION	CONTENTS
X'30'	X'0000'
X'32'	X'0000'
X'34'	X'0000'
X'36'	X'0050'
X'50'	X'D500'
X'52'	X'00CF'
X'54'	X'4300'
X'56'	X'0080'
For TTY X'78'	X'0294'
For HSPTR X'78'	X'0399'
For HSPTR/P X'78'	X'1399'

2. Place the program tape in the paper tape reader.

3. Execute at address X'30'.

4. When the processor halts, observe the CHKSUM byte, displayed on the Console Display Register D1. If it is zero, loading is complete; otherwise, repeat the loading procedure.

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

6. Address memory location X'A00' in the case of a 32 bit processor. Address memory location X'A04' in the case of a 16 bit processor.

7. Start program execution. Observe the following title is output to the list device.

   COMMON EIGHT LINE INTERRUPT MODULE TEST 06-134R04

OPERATING PROCEDURES

Normal Testing

1. When the title is printed, enter the appropriate TIMVAL option (see Appendix 3).

2. Enter the 'RUN' command. All default tests will be executed, and control returned to the user. (See Appendices 4 and 5 for explanation of printout; see the listing for a description of each test).

3. If no error is detected, select and run Test 5 (see Figure 1). When all tests (0-5) have been run successfully, normal testing is complete.

Optional Testing

Certain test options may be modified for further testing. See Appendix 3 for available options.

Error Procedures

Recoverable Errors

When a recoverable error is detected, an error message is printed if possible, and testing proceeds according to the options selected. See Appendix 5 for error messages printed.

Irrecoverable Errors

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

```
ERROR TTF2
PSW PPPP LOC LLLL
```

where TT is the number of the test in which the error was detected.

F2 is the code for Machine Malfunction.

PPPP is the least significant 16 bits of the PSW status when the error was detected.

LLLL is the least significant 16 bits of the PSW location counter when the error was detected.

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

In the case of Irrecoverable Errors other than Machine Malfunction Interrupt, the following message is immediately printed, and control then returned to the Command Processor:

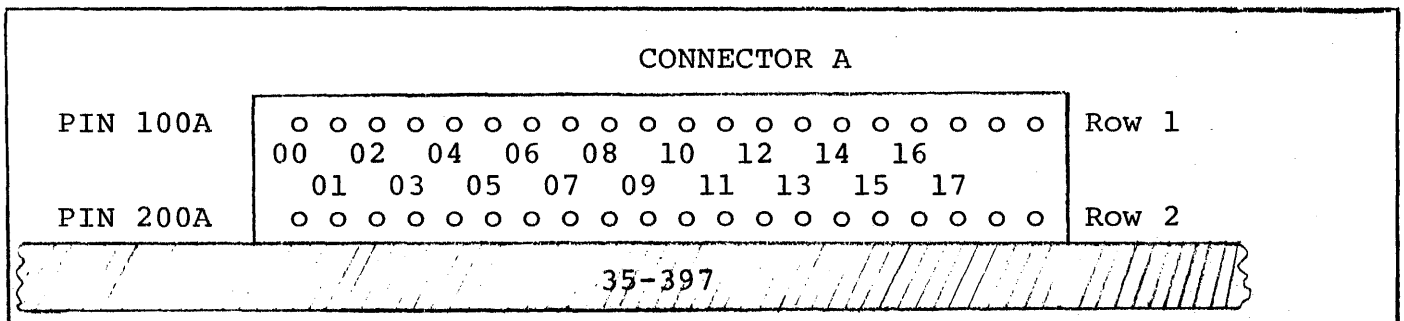
```
ERROR TTFN
PSW PPPP LOC LLLL
```

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

PROGRAMMING NOTES

Manually Generating An Interrupt

The procedure for manually generating an interrupt (Test 5) is shown in Figure 1.



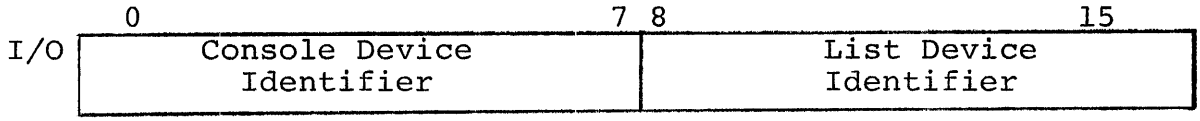
The message "GENERATE INTERRUPT" is printed on the console device. A pin in ROW1 (100A, 102A, 104A, 106A, 108A, 110A, 112A, 114A) is jumpered to pin in ROW2. After a fixed delay, the interrupt is acknowledged and the device number and status printed out. If more than one pin is jumpered at an instance the interrupt is acknowledged in terms of priority (see sample printout-Appendix 4). The above process is repeated eight times and the test ends. Also, if the processor is equipped with a display panel a number (80, 40, 20, 10, 08, 04, 02 or 01) is displayed whenever an interrupt is acknowledged from a line (0-7) respectively.

Figure 1. Procedure for Manually Generating an Interrupt

APPENDIX 1

CONSOLE DEVICE DEFINITION

1. The halfword labeled I/O (see the listing) has the default value for Teletype (address X'02') as the console device. If the configuration is different, the test program must be changed as follows:



Console/List Device Identifier	Explanation
X'01'	GDT/CRT on PASLA/PALM interface, strappe for FDX and the highest baud rate.
X'02'	TTY on TTY interface. GDT/CRT on Current Loop Interface
X'03'	Line Printer (Data Printer or Centronics on LP interface.
X'04'	Carousel 300 on PASLA/PALM interface, strapped for FDX and the highest baud rate.
X'05'	Micro I/O Bus Interface.
0,X'06'-X'FF'	Reserved. The program defaults it to 2.

2. The Teletype or Current Loop interface, if used, should be strapped for the device address of X'02'. If it is different, the halfword labeled TTYADR (see the listing) must be changed accordingly.

3. The Carousel, GDT (Graphic Display Terminal) or CRT; if used on PASLA interface should be strapped for the device address of X'10' and X'11' for receiving and transmitting sides respectively. If it is different, the halfword labeled CRTADR (in case of CRT) or C300ADR (in case of carousel) must be changed accordingly (see the listing).

4. 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 listing) must be changed accordingly.

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

APPENDIX 2

OPTION/COMMAND INPUT STRUCTURE

An asterisk (*) is output to the list device to indicate that the program is awaiting an option input. Any option may be typed in from the Console Input Device, followed by a space and the desired hexadecimal value; an exception is the TEST option which accepts argument separated by commas. A carriage return (CR) is issued to terminate every option/command input. An invalid option/command or value causes a (?) followed by a carriage return (CR), line feed (LF), and an asterisk (*) to occur.

APPENDIX 3

OPTIONS TABLE

OPTION	DEFAULT VALUE	DESCRIPTION
TEST	1,2,3,4	Selects the test(s) to be executed.
DEVADR	020	The hexadecimal operand specifies the physical device address of the highest priority Interrupt Line (Line 0) within the module.
INTLEV	0	Specifies Interrupt priority level of the eight-line Interrupt Module. In the case of Model 8/32, can be 0,1,2, or 3.
NOMSG	0	Determines whether all messages will be printed or only error messages will be printed. 0 = All Messages 1 = Error Messages Only
CONTIN	0	Enables the user to run all tests selected continuously, until the Break Key returns the program to the Command Mode. 0 = Normal Execution 1 = Continuous Execution
LOOP	0	Determines the number of times each test is to be executed.

OPTION	DEFAULT VALUE	DESCRIPTION
TIMVAL		Controls the length of software time-outs used in program. If this value is increased, the time-out delay is increased. The TIMVAL operand should be selected in accordance with the following table:
		Processor Model — TIMVAL 5/16 — 134 6/16 MOS — 14A 6/16 (750 nsec memory) — 14D 6/16 (1000 nsec memory) — 134 7/16 Basic — D2 7/16 HSALU - (750 nsec memory) — 14D (1000 nsec memory) — 134 7/32 - (750 nsec memory) — EB (1000 nsec memory) — D2 8/32 - — DA
OPTION		Enter this command to display all options with their current values on the console device.
RUN		Enter this command to execute the test.

APPENDIX 4

SAMPLE PRINTOUT

```
COMMON EIGHT LINE INTERRUPT MODULE TEST 06-134R04
*TIMVAL DA
*RUN

TEST 0
NO ERROR

TEST 1
NO ERROR

TEST 2
NO ERROR

TEST 3
NO ERROR

TEST 4
NO ERROR
END OF TEST
*TEST 5
*RUN
GENERATE INTERRUPT
DEV 020STA 00
NO MORE INTERRUPTS
GENERATE INTERRUPT
DEV 021 STA 00
      -
      -
      -
DEV 026 STA 00
NO MORE INTERRUPTS
GENERATE INTERRUPT
DEV 024 STA 00
DEV 026 STA 00
DEV 027 STA 00
NO MORE INTERRUPTS
NO ERROR
END OF TEST
*
```

APPENDIX 5 - ERROR TABLE

TEST NO.	ERROR CONDITION	EXPLANATION	SUGGESTED ACTION
Any	ERROR TT01 DEV DDD CMD ADR CCC	Interrupt Module generated an interrupt after a CLEAR command was issued.	
Any	ERROR TT02 DEV DDD CMD ADR CCC	Interrupt Module generated an interrupt while disabled.	
Any	ERROR TT03 DEV DDD CMD ADR CCC	Interrupt Module generated an interrupt while line was unmasked.	
Any	ERROR TT04 DEV DDD EXP DDD CMD ADR CCC	Interrupt Module did not generate an interrupt when line was set, enabled, and masked (Software Time-out).	

NOTE 1. TT = Test Number, 00-05

DDD = Device Address

CCC = Device Address to which all commands are sent.

APPENDIX 5 (Continued)

TEST NO.	ERROR CONDITION	EXPLANATION	SUGGESTED ACTION
Any	ERROR TT05 DEV DDD EXP DDD CMD ADR CCC	Interrupt Module generated an interrupt when expected, but with a wrong line address	Determine whether the correct line interrupted, but the wrong line address was returned. If the correct line address was returned, the line interrupted before a set, masked, and enabled line lower address.
Any	ERROR TT06 DEV DDD RESET DDD CMD ADR CCC	Interrupt Module generated an interrupt on a line just reset.	
05	ERROR 0507 CMD ADR CCC	The External Interrupt Line on the Interrupt Module did not generate an interrupt when manually grounded.	1. Check Fig. 1, "procedure for Manually Generating an Interrupt". 2. Repeat the test. 3. Ensure that proper contact is made between the appropriate pins on Connector A.

TEST NO.	ERROR CONDITION	EXPLANATION	SUGGESTED ACTION
Any	ERROR TT08 DEV DDD CMD ADR CCC	The Interrupt Module generated multiple interrupts returning the same line address.	1. Ensure that cable 17-170 is removed from Connector A on the 35-397 7" board.
0	ERROR TT09 DEV DDD CMD ADR CCC	False Sync. from a device address of the eight line interrupt module.	1. Ensure that the DEVADR option is properly entered for the eight line addresses in the system.

NOTE 1: TT = Test Number, 00-05

DDD = Device Address

CCC = Device Address to which all commands are sent.

IRRECOVERABLE ERRORS COMMON TO ALL TESTS

ERROR NO.	TYPE OF FAILURE
TTF1	Arithmetic Fault Interrupt
TTF2	Illegal Instruction Interrupt
TTF3	Machine Malfunction Interrupt (See Note 2)
TTF4	Unsolicited Immediate Interrupt
TTF5	Memory Access Controller/HW Floating Point Interrupt
TTF6	Interrupt into wrong register set.

NOTE 1. TT = Test Number from 00 to 05.

NOTE 2. The PSW resulting from the Machine Malfunction Interrupt is displayed. The last 4 bits of the PSW status define the type of failure, as described below:

X100	Parity Error on Data Fetch
0010	Parity Error on Instruction Fetch
X001	Power Fail
0000	Power Restore
1X0X	Parity Error or Power Fail during an Auto Driver Channel Operation (32-bit Processors only).

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

```
**0613403                                                                        ELI00010
CELIMT   PROG  COMMON EIGHT-LINE INTERRUPT MODULE TEST 06-134R04M96A13           ELI00020
         CROSS                                                                   ELI00030
         WIDTH 120                                                               ELI00040
         TARGT 16                                                                ELI00050
         SQCHK                                                                   ELI00060
* *                                                                              ELI00070
*                                                                                ELI00080
* COMMON EIGHT-LINE INTERRUPT MODULE TEST 06-134R04                              ELI00090
* COPYRIGHT INTERDATA, INC.      NOVEMBER 1977                                   ELI00100
*                                                                                ELI00110
* PROGRAM USES THE COMMON INSTRUCTION SET                                        ELI00120
*                                                                                ELI00130
* THIS PROGRAM TESTS THE EIGHT-LINE INTERRUPT MODULE.                            ELI00140
* THE PROGRAM CONSISTS OF SIX TESTS, WITH TEST 5 BEING THE MANUAL                ELI00150
* INTERRUPT TEST.                                                                ELI00160
* THERE ARE 9 OPTIONS AVAILABLE TO THE USER AND EIGHT ERROR MESSAGES             ELI00170
* TO ENABLE ISOLATION OF A MALFUNCTION TO THE HARDWARE LEVEL. EACH               ELI00180
* TEST EXCEPT SUBTEST 5 EXERCISES ALL COMMAND ADDRESSES ASSOCIATED               ELI00190
* WITH THE EIGHT-LINE INTERRUPT MODULE.                                          ELI00200
*                                                                                ELI00210
* THE PROGRAM REQUIRES EITHER 7/16 BASIC OR EQUIVALENT PROCESSOR,                ELI00220
* OR 7/32 OR EQUIVALENT PROCESSOR, WITH 16K BYTES OF MEMORY. OPTIONS             ELI00230
* AND RUN COMMAND ARE TO BE ENTERED VIA A CONSOLE DEVICE. A SINGLE               ELI00240
* INTERRUPT MODULE MAY BE TESTED AT A TIME.                                      ELI00250
*                                                                                ELI00260
* THE 06-134R04M17 TAPE IS AN ABSOLUTE TAPE WITH FRONT-END BOOT                  ELI00270
* LOADER.                                                                        ELI00280
*                                                                                ELI00290
* TEST 0                                                                         ELI00300
* VERIFIES THAT A CLEAR COMMAND (X'08') DOES CLEAR ALL                           ELI00310
* PENDING INTERRUPTS WITHIN THE EIGHT-LINE INTERRUPT MODULE.                     ELI00320
*                                                                                ELI00330
* TEST 1                                                                         ELI00340
* VERIFIES THAT ALL DEVICE INTERRUPTS ARE DISABLED WHEN A 'DISABLE'              ELI00350
* COMMAND IS ISSUED. THE ABILITY OF THE MASK TO PREVENT INTERRUPTS IS            ELI00360
* ALSO TESTED.                                                                   ELI00370
*                                                                                ELI00380
* TEST 2                                                                         ELI00390
* VERIFIES THAT INTERRUPT LINES WITHIN THE MODULE MAY BE SET                     ELI00400
* INDIVIDUALLY UNDER PROGRAM CONTROL.                                            ELI00410
*                                                                                ELI00420
* TEST 3                                                                         ELI00430
* VERIFIES THAT INTERRUPT LINES WITHIN THE MODULE MAY BE MASKED                  ELI00440
* INDIVIDUALLY UNDER PROGRAM CONTROL.                                            ELI00450
*                                                                                ELI00460
* TEST 4                                                                         ELI00470
* VERIFIES THAT INTERRUPT LINES WITHIN THE MODULE MAY BE RESET                   ELI00480
* INDIVIDUALLY UNDER PROGRAM CONTROL.                                            ELI00490
*                                                                                ELI00500
* TEST 5                                                                         ELI00510
* VERIFIES THAT INTERRUPTS MAY BE GENERATED BY MANUALLY CONNECTING               ELI00520
* CERTAIN PINS ON CONNECTOR 'A' OF THE INTERRUPT MODULE BOARD.                   ELI00530
```

```
                      *                                                        ELI00540
                      * ANY COMBINATION OF THESE TESTS MAY BE SELECTED AS A STRING AND   ELI00550
                      * CAN BE LOOPED OR RUN CONTINUOUSLY.                     ELI00560
                      *                                                        ELI00570
                      **ETPE                                                   ELI00580
                      *                                                        ELI00590
     0000 0000        R0       EQU   0                                         ELI00600
     0000 0001        R1       EQU   1                                         ELI00610
     0000 0002        R2       EQU   2                                         ELI00620
     0000 0003        R3       EQU   3                                         ELI00630
     0000 0004        R4       EQU   4                                         ELI00640
     0000 0005        R5       EQU   5                                         ELI00650
     0000 0006        R6       EQU   6                                         ELI00660
     0000 0007        R7       EQU   7                                         ELI00670
     0000 0008        R8       EQU   8                                         ELI00680
     0000 0009        R9       EQU   9                                         ELI00690
     0000 000A        R10      EQU   10                                        ELI00700
     0000 000B        R11      EQU   11                                        ELI00710
     0000 000C        R12      EQU   12                                        ELI00720
     0000 000D        R13      EQU   13                                        ELI00730
     0000 000E        R14      EQU   14                                        ELI00740
     0000 000E        RET      EQU   14                                        ELI00750
     0000 000F        R15      EQU   15                                        ELI00760
     0000 000F        LINK     EQU   15                                        ELI00770
                      *                                                        ELI00780
                      *                                                        ELI00790
                      *   BOOTLOADER WITH CHKSUM                               ELI00800
                      *                                                        ELI00810
0000R                          ORG   X'80'                                     ELI00820
0080  2421                     LIS   R2,1                                      ELI00830
0082  2303                     BS    BOOT                                      ELI00840
0084  2028                     DC    Z(PSWSAVE)         CURRENT PSW SAVE POINTER(32-BIT M/C)  ELI00850
0086  2030                     DC    Z(RSAVE)           REGISTER SAVE POINTER(32-BIT M/C)     ELI00860
0088  C810 0A00       BOOT     LHI   R1,ORIGIN1         R1 = ADR( FIRST BYTE OF TEST PROG )   ELI00870
008C  C830 201B                LHI   R3,LNZB+1          R3 = ADR( LAST NON-ZERO BYTE )        ELI00880
0090  4030 0022                STH   R3,X'22'           REGISTER SAVE POINTER(16-BIT M/C)     ELI00890
0094  2731                     SIS   R3,1                                      ELI00900
0096  C860 0000       MN       LHI   R6,0               R6 = CHKSUM BYTE = X'MN'  ELI00910
009A  D340 0078                LB    R4,X'78'           INPUT DEV ADR          ELI00920
009E  DE40 0079                OC    R4,X'79'                                  ELI00930
00A2  9D45            LEADER   SSR   R4,R5                                     ELI00940
00A4  2091                     BTBS  9,1                DU,BSY                 ELI00950
00A6  9B45                     RDR   R4,R5                                     ELI00960
00A8  0855                     LDAR  R5,R5                                     ELI00970
00AA  2234                     BZS   LEADER             IGNORE LEADER          ELI00980
00AC  D251 0000       LOAD     STB   R5,0(R1)           STORE 1ST NON-ZERO & SUBSEQUENT BYTE  ELI00990
00B0  D351 0000                LB    R5,0(R1)           RELOAD DATA BYTE TO    ELI01000
00B4  0765                     XAR   R6,R5              GENERATE CHKSUM        ELI01010
00B6  9481                     EXBR  R8,R1                                     ELI01020
00B8  9828                     WHR   R2,R8              DISPLAY MEMORY ADDRESS ELI01030
00BA  9D45                     SSR   R4,R5                                     ELI01040
00BC  2091                     BTBS  9,1                DU,BSY                 ELI01050
00BE  9B45                     RDR   R4,R5                                     ELI01060
00C0  C110 00AC                BXLE  R1,LOAD            LOAD TILL LAST BYTE    ELI01070
00C4  9486                     EXBR  R8,R6                                     ELI01080
```

```
00C6   9828              109              WHR   R2,R8             FINAL CHKSUM                  ELI01090
00C8   2478              110  LDWT        LIS   R7,8                                            ELI01100
00CA   917C              111              SLLS  R7,12             R7 = X'8000'                  ELI01110
00CC   9557              112              EPSR  R5,R7             HALT PROCESSOR.               ELI01120
00CE   2203              113              BS    LDWT                                            ELI01130
```

```
0000                          ORG   X'A00'                                            ELI01150
0A00   4300 0A32    ORIGIN1   B     START1        START HERE FOR 32-BIT PROCESSOR     ELI01160
0A04                          IFZ   ADC-2                                             ELI01170
0A04   4300 0A48    ORIGIN2   B     START2        START HERE FOR 16-BIT PROCESSOR     ELI01180
0A08   4300 0A62    ORIGIN3   B     START3        SPECIAL 32-BIT PROCESSOR START      ELI01190
0A0C   4300 0A66    ORIGIN4   B     START4        SPECIAL 16-BIT PROCESSOR START      ELI01200
                              ELSE                                                    ELI01210
                    ORIGIN2   B     START3        SPECIAL START(S) - 32 BIT PROCESSOR ELI01220
                              B     START3                                            ELI01230
                              B     START3                                            ELI01240
                              ENDC                                                    ELI01250
                    *                                                                 ELI01260
                    *----------------------------                                     ELI01270
                    *   TEST CONSTANTS                                *               ELI01280
                    *                                                                 ELI01290
0A10   0202         IO        DC    X'0202'       I/O DEVICE(S) IDENTIFIER            ELI01300
0A12   1011         PASLADR   DC    X'1011'       PASLA/PALM READ/WRITE ADDRESSES     ELI01310
0A14   0202         CLIFADR   DC    X'0202'       CURRENT LOOP INTERFACE R/W ADDRESSES ELI01320
0A16   6262         LPADR     DC    X'6262'       LINE PRINTER ADDRESS                ELI01330
0A18   1011         C300ADR   DC    X'1011'       CAROUSEL 300/PASLA ADDRESSES        ELI01340
0A1A   C0C0         MICROBUS  DC    X'C0C0'       MICROBUS ADDRESS                    ELI01350
0A1C   0000                   DCX   0             PROVISION FOR SPECIAL DEVICE        ELI01360
                    *                                                                 ELI01370
                    * IO =    0101  FOR CRT ON PASLA                                  ELI01380
                    *         0202  FOR TELETYPE, CAROUSEL 15/30                      ELI01390
                    *         XX03  FOR LINE PRINTER                                  ELI01400
                    *         0404  FOR CAROUSEL 300                                  ELI01410
                    *         0505  FOR MICROBUS                                      ELI01420
                    *                                                                 ELI01430
0A1E   0140         TIME      DC    X'140'        CONSTANT FOR 1 MS DELAY(X'C8'-MOD70) ELI01440
0A20   0000                   DCX   0             RESERVED                            ELI01450
0A22   70F0         PSW       DCX   70F0          PSW USED IN PROGRAM                 ELI01460
0A24   30F0         PSW2      DCX   30F0          PSW USED IN EXEC                    ELI01470
0A26   70F0         PSW3      DCX   70F0                                              ELI01480
0A28   0000                   DCX   0             RESERVED                            ELI01490
0A2A   0000                   DCX   0             RESERVED                            ELI01500
0A2C   0000                   DCX   0             RESERVED                            ELI01510
0A2E   0000                   DCX   0             RESERVED                            ELI01520
0A30   0000                   DCX   0             RESERVED                            ELI01530
                    *----------------------------                                     ELI01540
                    *                                                                 ELI01550
0A32   2410         START1    LIS   R1,0                                              ELI01560
0A34   4010 0030              STH   R1,X'30'      DISABLE INT AT PROCESSOR LEVEL      ELI01570
0A38   4820 0A24              LH    R2,PSW2                                           ELI01580
0A3C   4020 0032              STH   R2,X'32'      SELECT REG SET 15                   ELI01590
0A40                          IFZ   ADC-2                                             ELI01600
0A40   2521                   LCS   R2,1                                              ELI01610
0A42   4020 1712              STH   R2,MOD32      SET MODEL 32 PROCESSOR FLAG         ELI01620
0A46   2306                   BS    ST                                                ELI01630
0A48   2410         START2    LIS   R1,0                                              ELI01640
0A4A   4010 1712              STH   R1,MOD32      RESET MOD 32 PROCESSOR FLAG         ELI01650
0A4E   4810 0A24              LH    R1,PSW2                                           ELI01660
                              ENDC                                                    ELI01670
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0A52   C820 0A6A     ST       LHI   R2,START                                                   ELI01680
0A56   4010 0034              STH   R1,X'34'                                                   ELI01690
0A5A   4020 0036              STH   R2,X'36'              II INT NEW PSW LOC                   ELI01700
0A5E   0000                   DCX   0                     TAKE AN ILLEGAL INSTRUCTION INT      ELI01710
0A60   2200                   BS    *                     HALT IF II NOT TAKEN                 ELI01720
                     *                                                                         ELI01730
0A62   4300 0A32     START3   B     START1                INSERT SPECIAL ROUTINE HERE          ELI01740
0A66                          IFZ   ADC-2                                                      ELI01750
0A66   4300 0A48     START4   B     START2                INSERT SPECIAL ROUTINE HERE          ELI01760
                              ENDC                                                             ELI01770
                     *                                                                         ELI01780
0A6A   D310 0A10     START    LB    R1,IO                 GET I/O IDENTIFIERS                  ELI01790
0A6E   D320 0A11              LB    R2,IO+1                                                    ELI01800
0A72   2436                   LIS   R3,6                  IDENTIFIER CAN BE 1,2,3,4,5          ELI01810
0A74   0513                   CLAR  R1,R3                                                      ELI01820
0A76   2182                   BLS   IO.OK1                BRANCH IF KB IDENTIFIER OK           ELI01830
0A78   2412                   LIS   R1,2                  OTHERWISE FORCE IT TO BE TTY         ELI01840
0A7A   0523          IO.OK1   CLAR  R2,R3                                                      ELI01850
0A7C   2182                   BLS   IO.OK2                SAME TEST FOR LIST DEVICE            ELI01860
0A7E   2422                   LIS   R2,2                                                       ELI01870
0A80   D210 0A10     IO.OK2   STB   R1,IO                 REESTABLISH VALUES                   ELI01880
0A84   D220 0A11              STB   R2,IO+1                                                    ELI01890
0A88   D362 1744              LB    R6,CONRQ2S(R2)                                             ELI01900
0A8C   4060 1728              STH   R6,PASFLG2            SET PASLA FLAG (LIST DEVICE)         ELI01910
0A90   0866                   LDAR  R6,R6                                                      ELI01920
0A92   2336                   BZS   IO.OK3                SKIP IF NOT PASLA                    ELI01930
0A94   9121                   SLHLS R2,1                                                       ELI01940
0A96   D302 0A11              LB    R0,IO+1(R2)                                                ELI01950
0A9A   DE02 1738              OC    R0,CON2ND(R2)         ISSUE 2ND COMMAND (TO LIST DEVICE)   ELI01960
                     *                                                                         ELI01970
0A9E   41F0 13FC     IO.OK3   BAL   LINK,SETKB            ESTABLISH KEYBOARD DEVICE (& IOSAVE) ELI01980
0AA2   9310                   LBR   R1,R0                 (R1) = 1,2,4,5 ; (R0 = KBIDENT)      ELI01990
0AA4   9111                   SLHLS R1,1                  (R1) = 2,4,6,A                       ELI02000
0AA6   4831 0A10              LH    R3,IO(R1)                                                  ELI02010
0AAA   4030 172A              STH   R3,CONADR             SET UP CONSOLE DEVICE ADDRESS        ELI02020
0AAE   4821 172C              LH    R2,CONRD(R1)                                               ELI02030
0AB2   4020 172C              STH   R2,CONRD              SET UP R/W COMMANDS                  ELI02040
0AB6   4821 1738              LH    R2,CON2ND(R1)                                              ELI02050
0ABA   4020 1738              STH   R2,CON2ND             2ND CMD; ENABLE READ CMD             ELI02060
0ABE   9011                   SRHLS R1,1                                                       ELI02070
0AC0   D341 1744              LB    R4,CONRQ2S(R1)                                             ELI02080
0AC4   D240 1744              STB   R4,CONRQ2S            CONSOLE REQUEST TO SEND              ELI02090
0AC8   4040 1726              STH   R4,PASFLG             SET PASLA FLAG (CONSOLE)             ELI02100
0ACC   9333                   LBR   R3,R3                 MASK CONSOLE ADDRESS TO 8 BITS       ELI02110
0ACE   0844                   LDAR  R4,R4                                                      ELI02120
0AD0   2333                   BZS   IO.OK4                SKIP 2ND OC IF NOT PASLA DEVICE      ELI02130
0AD2   9422                   EXBR  R2,R2                                                      ELI02140
0AD4   9E32                   OCR   R3,R2                 ISSUE 2ND COMMAND (TO CONSOLE)       ELI02150
0AD6   DE30 172C     IO.OK4   OC    R3,CONRD              PUT CONSOLE IN READ MODE             ELI02160
0ADA   9B3F                   RDR   R3,R15                READ A DUMMY CHARACTER (SET BUSY)    ELI02170
                     *                                                                         ELI02180
0ADC   41F0 145A              BAL   LINK,LCORE            SET UP LOW CORE                      ELI02190
0AE0   2400                   LIS   R0,0                                                       ELI02200
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0AE2  4000 1754          221          STH   R0,WASDU          RESET 'DEVICE UNAVAILABLE' FLAGS      ELI02210
0AE6  4000 1756          222          STH   R0,WASDU1                                             ELI02220
0AEA  41F0 1274          223          BAL   LINK,CRLF                                             ELI02230
0AEE  C850 1890          224          LHI   R5,TITLE                                              ELI02240
0AF2  41F0 11F0          225          BAL   R15,PRINT         PRINT TEST PROGRAM TITLE            ELI02250
                         226  *---------------------------                                        ELI02260
                         227  *  KEYBOARD INPUT ROUTINE                                           ELI02270
                         228  *                                                                   ELI02280
0AF6  41F0 1274          229  OPTIN   BAL   LINK,CRLF         CR,LF TO LIST DEVICE                ELI02290
                         230  *                                                                   ELI02300
0AFA  4820 0A24          231  OPTIN1  LH    R2,PSW2                                               ELI02310
0AFE  9512               232          EPSR  R1,R2             NO INT, REG SET 15                  ELI02320
0B00  41F0 13FC          233          BAL   LINK,SETKB        ESTABLISH CONSOLE                   ELI02330
0B04  0340 180E          234          LB    R4,AMSG           OUTPUT AN * TO INDICATE             ELI02340
0B08  41F0 1282          235          BAL   LINK,OUTCHR       COMMAND MODE ESTABLISHED            ELI02350
0B0C  2541               236          LCS   R4,1              X'FF'                               ELI02360
0B0E  41F0 1282          237          BAL   LINK,OUTCHR                                           ELI02370
0B12  C8C0 133E          238          LHI   R12,QUESTN        SET UP R12 FOR ERR ROUTINE          ELI02380
0B16  C800 2020          239          LHI   R0,X'2020'        BLANK OUT COMMAND BUFFER            ELI02390
0B1A  4000 201A          240          STH   R0,OPTBUF         WHICH WILL CONTAIN OPTION           ELI02400
0B1E  4000 201C          241          STH   R0,OPTBUF+2       NAME                                ELI02410
0B22  4000 201E          242          STH   R0,OPTBUF+4                                           ELI02420
0B26  2410               243          LIS   R1,0              CLEAR OPTBUF INDEX                  ELI02430
0B28  41F0 1310          244  RDCHR   BAL   R15,GETCHR        GET A CHAR IN R4                    ELI02440
0B2C  C540 0060          245          CLHI  R4,X'60'          UPPER CASE ALPHA ?                  ELI02450
0B30  2183               246          BLS   RDCHAR0           BRANCH IF NO.                       ELI02460
0B32  CB40 0020          247          SHI   R4,X'20'          CONVERT TO LOWER CASE               ELI02470
0B36  C540 0023          248  RDCHAR0 CLHI  R4,X'23'          IS IT # ?                           ELI02480
0B3A  4330 0AF6          249          BE    OPTIN                                                 ELI02490
0B3E  C540 005F          250          CLHI  R4,X'5F'          LEFT ARROW, UNDERLINE OR DELETE ?   ELI02500
0B42  2334               251          BES   RDCHAR1                                             ELI02510
0B44  C540 0008          252          CLHI  R4,X'08'          BACK SPACE ?                        ELI02520
0B48  2139               253          BNES  RDCHR1            NO, BRANCH                          ELI02530
0B4A  2711               254  RDCHAR1 SIS   R1,1              YES, DECREMENT INDEX                ELI02540
0B4C  021C               255          BMR   R12               BUFFER UNDERFLOW; PRINT '?'         ELI02550
0B4E  C800 0020          256          LHI   R0,X'20'                                              ELI02560
0B52  D201 201A          257          STB   R0,OPTBUF(R1)                                         ELI02570
0B56  4300 0B28          258          B     RDCHR                                                 ELI02580
0B5A  C540 000D          259  RDCHR1  CLHI  R4,X'0D'          IS IT CR ?                          ELI02590
0B5E  233C               260          BES   LOOKUP            YES, TRY MATCH                      ELI02600
0B60  C540 0020          261          CLHI  R4,X'20'          IS IT A BLANK?                      ELI02610
0B64  2339               262          BES   LOOKUP            YES, TRY MATCH                      ELI02620
0B66  C510 0006          263          CLHI  R1,6              7 CHARACTERS INPUT ?                ELI02630
0B6A  038C               264          BNLR  R12               IF YES, ERROR                       ELI02640
0B6C  D241 201A          265          STB   R4,OPTBUF(R1)     STORE CURRENT BYTE                  ELI02650
0B70  2611               266          AIS   R1,1              BUMP BUFFER INDEX                   ELI02660
0B72  4300 0B28          267          B     RDCHR             READ NEXT CHARACTER                 ELI02670
                         268  *-------------------------------                                   ELI02680
                         269  *  OPTION MATCH ROUTINE                                           ELI02690
                         270  *                                                                   ELI02700
0B76  C810 1810          271  LOOKUP  LHI   R1,OPT            LOAD ADDRESS OF OPTION TABLE        ELI02710
0B7A  2430               272  LOOK1   LIS   R3,0              CLEAR BUFFER INDEX                  ELI02720
0B7C  0861               273          LDAR  R6,R1             SET OPTION WORD INDEX               ELI02730
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0B7E  4856 0000          274  LOOK2   LH    R5,0(R6)                                    ELI02740
0B82  021C               275           BMR   R12             IF MINUS, THEN NO MATCH = ERROR  ELI02750
0B84  4553 201A          276           CLH   R5,OPTBUF(R3)   COMPARE TO OPTBUF HW        ELI02760
0B88  2333               277           BES   LOOK3                                       ELI02770
0B8A  261C               278           AIS   R1,12                                      ELI02780
0B8C  2209               279           BS    LOOK1                                       ELI02790
0B8E  2632               280  LOOK3   AIS   R3,2             TRY NEXT HW               ELI02800
0B90  2662               281           AIS   R6,2                                       ELI02810
0B92  C530 0006          282           CLHI  R3,6            3 MATCHING HW FOUND ?     ELI02820
0B96  208C               283           BLS   LOOK2                                       ELI02830
                         284  *                                                          ELI02840
0B98  C510 1870          285           CLHI  R1,RUN          RUN COMMAND ?             ELI02850
0B9C  4330 0D80          286           BE    RUNIT                                       ELI02860
0BA0  C510 1864          287           CLHI  R1,OPTION       OPTION CMD ?              ELI02870
0BA4  4230 0CB6          288           BNE   LOOK4           NO, LOOK FURTHER          ELI02880
                         289  *-----------------------------                            ELI02890
                         290  *  TO PROCESS INPUT COMMAND 'OPTION'                      ELI02900
                         291  *                                                          ELI02910
0BA8  C540 000D          292           CLHI  R4,X'0D'        CR ?                      ELI02920
0BAC  233C               293           BES   OPTEXX          YES, BRANCH               ELI02930
0BAE  41E0 10C6          294           BAL   R14,OPTVAL      NO, GET OPTION DEV. PRINTOUT NUM.  ELI02940
0BB2  C560 0006          295           CLHI  R6,6            IS DEVICE NUMBER VALID ?  ELI02950
0BB6  2387               296           BNLS  OPTEXX          NO, BRANCH                ELI02960
0BB8  C840 000A          297           LHI   R4,X'0A'        YES, LOAD AN LF CHARACTER ELI02970
0BBC  41F0 1282          298           BAL   LINK,OUTCHR     WRITE IT TO THE CONSOLE   ELI02980
0BC0  D260 2021          299           STB   R6,IOSAVE+1     CHANGE THE LIST DEVICE    ELI02990
0BC4  4820 186C          300  OPTEXX  LH    R2,OPTION+8     CHECK FOR SPECIAL ROUTINE ELI03000
0BC8  0232               301           BNZR  R2              LINK TO ROUTINE           ELI03010
                         302  *                                                          ELI03020
0BCA  C830 1810          303  OPTRTN  LHI   R3,TEST         RETURN HERE               ELI03030
0BCE  C8E0 0C54          304           LHI   R14,OPTCMD8                                 ELI03040
0BD2  41F0 1274          305           BAL   LINK,CRLF                                   ELI03050
0BD6  2420               306  OPTCMD  LIS   R2,0            RESET COUNTER             ELI03060
0BD8  D342 1810          307  OPTCMD1 LB    R4,OPT(R2)      TO PRINT TEST             ELI03070
0BDC  41F0 1282          308           BAL   LINK,OUTCHR                                 ELI03080
0BE0  2621               309           AIS   R2,1                                        ELI03090
0BE2  C520 0006          310           CLHI  R2,6                                        ELI03100
0BE6  2087               311           BLS   OPTCMD1                                     ELI03110
0BE8  C840 0020          312           LHI   R4,C' '                                     ELI03120
0BEC  41F0 1282          313           BAL   LINK,OUTCHR     OUTPUT 1 SPACE            ELI03130
0BF0  2450               314           LIS   R5,0            TO PRINT SELECTED TEST NUMBERS  ELI03140
0BF2  4050 1710          315           STH   R5,FIRST                                    ELI03150
0BF6  4823 0006          316           LH    R2,6(R3)        FIRST TEST WORD           ELI03160
0BFA  2440               317  OPTCMD2 LIS   R4,0             START WITH TEST 0         ELI03170
0BFC  4040 2022          318           STH   R4,TEMP                                     ELI03180
0C00  9121               319  OPTCMD3 SLHLS R2,1                                        ELI03190
0C02  4380 0C34          320           BNC   OPTCMD7                                     ELI03200
0C06  4040 2022          321  OPTCMD4 STH   R4,TEMP         OPTION VALUE FOUND.       ELI03210
0C0A  4800 1710          322           LH    R0,FIRST        IS IT FIRST ?             ELI03220
0C0E  2335               323           BZS   OPTCMD5                                     ELI03230
0C10  C840 002C          324           LHI   R4,C','         NO, OUTPUT COMMA          ELI03240
0C14  41F0 1282          325           BAL   LINK,OUTCHR                                 ELI03250
0C18  40F0 1710          326  OPTCMD5 STH   LINK,FIRST                                   ELI03260
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0C1C   0855            327          LDAR  R5,R5             TEST VALUE FROM SECOND HW          ELI03270
0C1E   2335            328          BZS   OPTCMD6           NO                                 ELI03280
0C20   C840 0031       329          LHI   R4,C'1'           YES,OUTPUT '1'                     ELI03290
0C24   41F0 1282       330          BAL   LINK,OUTCHR                                          ELI03300
0C28   4840 2022       331 OPTCMD6  LH    R4,TEMP           RESTORE R4                         ELI03310
0C2C   D344 1778       332          LB    R4,HEXTAB(R4)     CONVERT                            ELI03320
0C30   41F0 1282       333          BAL   LINK,OUTCHR       OUTPUT 0-F                         ELI03330
0C34   4840 2022       334 OPTCMD7  LH    R4,TEMP           RESTORE                            ELI03340
0C38   2641            335          AIS   R4,1              INCREMENT TEST #                   ELI03350
0C3A   4040 2022       336          STH   R4,TEMP                                             ELI03360
0C3E   C540 0010       337          CLHI  R4,16                                               ELI03370
0C42   4280 0C00       338          BL    OPTCMD3                                             ELI03380
0C46   0855            339 OPTCMD71 LDAR  R5,R5             DONE ?                             ELI03390
0C48   023E            340          BNZR  R14                                                 ELI03400
0C4A   4823 0008       341          LH    R2,8(R3)          SECOND TEST WORD                   ELI03410
0C4E   2451            342          LIS   R5,1              R5 = 1 FOR SECOND TEST HW          ELI03420
0C50   4300 08FA       343          B     OPTCMD2                                             ELI03430
                       344 *--------------------------------                                  ELI03440
                       345 *  TO OUTPUT OTHER OPTION NAMES & VALUES                           ELI03450
                       346 *                                                                  ELI03460
0C54   41F0 1274       347 OPTCMD8  BAL   LINK,CRLF                                          ELI03470
0C58   2461            348          LIS   R6,1              SET LINE COUNTER                   ELI03480
0C5A   C820 181C       349          LHI   R2,OPT+12         R2 POINTS TO THE NAME              ELI03490
0C5E   2436            350 OPTCMD9  LIS   R3,6                                                ELI03500
0C60   D342 0000       351 OPTCMD10 LB    R4,0(R2)                                            ELI03510
0C64   41F0 1282       352          BAL   LINK,OUTCHR       OUTPUT OPTION NAME CHAR            ELI03520
0C68   2621            353          AIS   R2,1                                                ELI03530
0C6A   2731            354          SIS   R3,1              6 CHARACTERS OUTPUT ?              ELI03540
0C6C   2026            355          BPS   OPTCMD10          NO,LOOP                            ELI03550
0C6E   C840 0020       356          LHI   R4,C' '                                             ELI03560
0C72   41F0 1282       357          BAL   LINK,OUTCHR       OUTPUT ONE SPACE                   ELI03570
0C76   4852 0000       358          LH    R5,0(R2)          R5 = OPTION VALUE                  ELI03580
0C7A   2404            359          LIS   R0,4                                                ELI03590
0C7C   41F0 112A       360          BAL   LINK,R5HEX        WRITE OPTION VALUE IN HEX (4 DIGITS) ELI03600
0C80   D300 0A10       361          LB    R0,IO                                               ELI03610
0C84   2701            362          SIS   R0,1              CONSOLE = CRT ?                    ELI03620
0C86   213D            363          BNZS  OPTCMD12          BRANCH: NO.                        ELI03630
0C88   2661            364          AIS   R6,1              INCREMENT LINE COUNTER.            ELI03640
0C8A   C560 0014       365          CLHI  R6,20             PAGE FULL ?                        ELI03650
0C8E   2189            366          BLS   OPTCMD12          NO                                 ELI03660
0C90   2460            367          LIS   R6,0              INITIALIZE LINE COUNT              ELI03670
0C92   41F0 1310       368 OPTCMD11 BAL   LINK,GETCHR                                         ELI03680
0C96   274D            369          SIS   R4,13             CR ?                               ELI03690
0C98   4330 0AF6       370          BZ    OPTIN             TO ACCEPT NEXT COMMAND             ELI03700
0C9C   2643            371          AIS   R4,3              LF ?                               ELI03710
0C9E   2036            372          BNZS  OPTCMD11          IF YES, PRINT NEXT PAGE            ELI03720
0CA0   41F0 1274       373 OPTCMD12 BAL   LINK,CRLF                                          ELI03730
0CA4   41F0 1358       374          BAL   LINK,TSTBRK       EXIT IF 'BREAK' PRESSED.           ELI03740
0CA8   2626            375          AIS   R2,6                                                ELI03750
0CAA   C520 1864       376          CLHI  R2,OPTEND2        ALL PRINTING OPTIONS DONE ?        ELI03760
0CAE   4280 0C5E       377          BL    OPTCMD9           NO,LOOP FOR NEXT ONE               ELI03770
0CB2   4300 0AFA       378          B     OPTIN1            TO ACCEPT NEXT COMMAND             ELI03780
                       379 *----------------------------                                      ELI03790
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0CB6  C510 1810          380 LOOK4   CLHI  R1,TEST            'TEST' OPTION ?                    ELI03800
0CBA  4330 0D2E          381         BE    TESTOP                                                 ELI03810
                         382 *  TO PROCESS COMMANDS OTHER THAN 'TEST', 'OPTION'.                  ELI03820
                         383 *                                                                    ELI03830
0CBE  274D               384         SIS   R4,13              OPT FOLLOWED BY CR ?               ELI03840
0CC0  033C               385         BZR   R12                 YES, ERROR                         ELI03850
0CC2  41E0 10C6          386         BAL   R14,OPTVAL          GET OPTION VALUE IN R6             ELI03860
0CC6  274D               387         SIS   R4,13              TERMINATED BY CR ?                 ELI03870
0CC8  023C               388         BNZR  R12                 IF NO, BRANCH                      ELI03880
0CCA  48E1 0008          389         LH    R14,8(R1)           GET OPTION CHECK ROUTINE ADDRESS   ELI03890
0CCE  2332               390         BZS   LOOK5                                                  ELI03900
0CD0  01FE               391         BALR  R15,R14             LINK OPTION CHECK ROUTINE          ELI03910
                         392 *                                 RETURN HERE                        ELI03920
0CD2  4061 0006          393 LOOK5   STH   R6,6(R1)           STORE OPTION VALUE                 ELI03930
0CD6  4300 0AF6          394         B     OPTIN               TO ACCEPT NEXT COMMAND             ELI03940
                         395 *                                                                    ELI03950
0CDA  C360 FFFE          396 ZERONE  THI   R6,X'FFFE'          IGNORE LSB                         ELI03960
0CDE  033F               397         BZR   R15                 OKAY                               ELI03970
0CE0  030C               398         BR    R12                 ERROR RETURN                       ELI03980
                         399 *                                                                    ELI03990
0CE2  C560 0400          400 ADR     CLHI  R6,X'400'           (R6) = 10 BIT DEVICE ADDRESS       ELI04000
0CE6  028F               401         BLR   R15                 RETURN TO LOOK5                    ELI04010
0CE8  030C               402         BR    R12                                                    ELI04020
                         403 *                                                                    ELI04030
0CEA  C560 000F          404 LEVEL   CLHI  R6,15              (R6) = INTERRUPT LEVEL HEX DIGIT   ELI04040
0CEE  028F               405         BLR   R15                 RETURN TO LOOK5                    ELI04050
0CF0  030C               406         BR    R12                                                    ELI04060
                         407 *--------------------------------                                    ELI04070
                         408 * TO CHECK THAT OPTION ENTRY IN R6 IS IN DECIMAL DIGITS,              ELI04080
                         409 * TO CONVERT DECIMAL ENTRY IN R6 TO HEX VALUE AND                     ELI04090
                         410 * STORE IT @ 0(R5).                                                  ELI04100
                         411 *                                                                    ELI04110
0CF2  D000 2030          412 DECHEX  STM   R0,RSAVE                                               ELI04120
0CF6  2400               413         LIS   R0,0                ACCUMULATOR                        ELI04130
0CF8  2410               414         LIS   R1,0                TABLE INDEX                        ELI04140
0CFA  2420               415         LIS   R2,0                SHIFT COUNTER                      ELI04150
0CFC  0836               416 DECLP1  LDAR  R3,R6               COPY INPUT VALUE                   ELI04160
0CFE  CC32 0000          417         SRAL  R3,0(R2)                                               ELI04170
0D02  4330 0D24          418         BZ    DECHEX1             TO RETURN                          ELI04180
0D06  C430 000F          419         NHI   R3,15                                                  ELI04190
0D0A  C530 000A          420         CLHI  R3,10               VALID DECIMAL DIGIT ?              ELI04200
0D0E  038C               421         BNLR  R12                 IF NOT, ERROR.                     ELI04210
0D10  4871 176E          422         LDA   R7,DECTAB(R1)       1,10,....10000                     ELI04220
0D14  2731               423 DECLP2  SIS   R3,1                                                   ELI04230
0D16  2113               424         BMS   DECLP3                                                 ELI04240
0D18  0A07               425         AAR   R0,R7               ADD IN CURRENT VALUE               ELI04250
0D1A  2203               426         BS    DECLP2                                                 ELI04260
0D1C  2624               427 DECLP3  AIS   R2,4               INCREMENT SHIFTER                  ELI04270
0D1E  2612               428         AIS   R1,ADC              INCREMENT POINTER                  ELI04280
0D20  4300 0CFC          429         B     DECLP1                                                 ELI04290
0D24  4005 0000          430 DECHEX1 STH   R0,0(R5)           STORE HEX OPTION VALUE             ELI04300
0D28  D100 2030          431         LM    R0,RSAVE                                               ELI04310
0D2C  030F               432         BR    LINK                RETURN                             ELI04320
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                  *----------------------------                                         ELI04330
                  *  TEST OPTION PROCESS ROUTINE                                        ELI04340
                  *                                                                     ELI04350
0D2E  274D        TESTOP   SIS   R4,13          'TEST' FOLLOWED BY (CR) ?               ELI04360
0D30  213B                 BNZS  TSTOP1                                                 ELI04370
0D32  4800 187E            LH    R0,DEFTESTS    YES, SET TEST OPTION TO                 ELI04380
0D36  4000 1816            STH   R0,TEST+6      FIRST TEST WORD                         ELI04390
0D3A  4800 1880            LH    R0,DEFTESTS+2  ALL DEFAULT TESTS IN PROGRAM            ELI04400
0D3E  4000 1818            STH   R0,TEST+8      SECOND TEST WORD                        ELI04410
0D42  4300 0AF6            B     OPTIN          TO ACCEPT NEXT COMMAND                  ELI04420
                  *                                                                     ELI04430
0D46  4850 1882   TSTOP1   LH    R5,MAXTST                                              ELI04440
0D4A  2470                 LIS   R7,0           TEST BIT ACCUMULATORS                   ELI04450
0D4C  2480                 LIS   R8,0                                                   ELI04460
0D4E  41E0 10C6   TSTOP2   BAL   R14,OPTVAL     GET OPTION VALUE IN R6                  ELI04470
0D52  0556                 CLAR  R5,R6                                                  ELI04480
0D54  028C                 BLR   R12            ERROR: INVALID TEST NUMBER              ELI04490
0D56  C560 0010            CLHI  R6,16          R6 < 16 ?                               ELI04500
0D5A  2385                 BNLS  TSTOP3         NO                                      ELI04510
0D5C  41E0 1102            BAL   R14,UNARY      GET UNARY OPERAND IN R3                 ELI04520
0D60  0673                 OAR   R7,R3          SET CURRENT BIT                         ELI04530
0D62  2306                 BS    TSTOP4                                                 ELI04540
0D64  CB60 0010   TSTOP3   SHI   R6,16          R6 = 0-F                                ELI04550
0D68  41E0 1102            BAL   R14,UNARY                                              ELI04560
0D6C  0683                 OAR   R8,R3          SET CURRENT BIT                         ELI04570
0D6E  274D        TSTOP4   SIS   R4,13          TERMINATED BY CR ?                      ELI04580
0D70  4230 0D4E            BNZ   TSTOP2                                                 ELI04590
0D74  4070 1816            STH   R7,TEST+6      STORE VALID SELECTED TESTS              ELI04600
0D78  4080 1818            STH   R8,TEST+8                                              ELI04610
0D7C  4300 0AF6            B     OPTIN          TO ACCEPT NEXT COMMAND                  ELI04620
                  *----------------------------                                         ELI04630
                  *                                                                     ELI04640
0D80  41F0 1274   RUNIT    BAL   LINK,CRLF                                              ELI04650
0D84  24F0                 LIS   R15,0                                                  ELI04660
0D86  40F0 1754            STH   R15,WASDU      RESET DU FLAGS                          ELI04670
0D8A  40F0 1756            STH   R15,WASDU1                                             ELI04680
0D8E  240F                 LIS   R0,15          TO FIND HIGHEST SELECTED TEST  NO.      ELI04690
0D90  4810 1818            LH    R1,TEST+8      CHECK SECOND TEST HW                    ELI04700
0D94  9011        KEEP1    SRLS  R1,1                                                   ELI04710
0D96  218B                 BCS   FOUND1         R0 = F-0                                ELI04720
0D98  2701                 SIS   R0,1                                                   ELI04730
0D9A  2213                 BNMS  KEEP1          TRY NEXT DIGIT                          ELI04740
0D9C  240F                 LIS   R0,15          INITIALIZE AGAIN                        ELI04750
0D9E  4810 1816            LH    R1,TEST+6      CHECK FIRST TEST HW                     ELI04760
0DA2  9011        KEEP2    SRLS  R1,1                                                   ELI04770
0DA4  2186                 BCS   FOUND2         R0 = F-0 = TEST #                       ELI04780
0DA6  2701                 SIS   R0,1                                                   ELI04790
0DA8  2213                 BNMS  KEEP2          LOOP                                    ELI04800
0DAA  030C                 BR    R12            TEST NOT SELECTED                       ELI04810
0DAC  CA00 0010   FOUND1   AHI   R0,16          ADJUST TEST # FOR SECOND HW             ELI04820
0DB0  4000 1752   FOUND2   STH   R0,SELTST      HIGHEST SELECTED TEST NUMBER            ELI04830
0DB4  4800 0A10            LH    R0,IO                                                  ELI04840
0DB8  4000 2020            STH   R0,IOSAVE      RESTORE USER'S I/O CHOICE               ELI04850
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0DBC   41F0 1274        486           BAL   LINK,CRLF                                                  ELI04860
0DC0   41F0 1FBA        487           BAL   LINK,INIT          LINK USER INITIALIZATION ROUTINE        ELI04870
                        488  *                                                                         ELI04880
                        489  *                                                                         ELI04890
                        490  *  RESET TEST PARAMETERS                                                  ELI04900
                        491  *                                                                         ELI04910
0DC4   2400             492  INITRET  LIS   R0,0               RETURN HERE FROM USER'S INIT ROUTINE    ELI04920
0DC6   4000 174E        493           STH   R0,ISITERR         RESET ERROR FLAG                        ELI04930
0DCA   4000 1758        494           STH   R0,TOTAL           RESET TOTAL                             ELI04940
0DCE   4000 175A        495           STH   R0,TOTERR          RESET TOTERR                            ELI04950
0DD2   4000 1754        496           STH   R0,WASDU           RESET WASDU                             ELI04960
0DD6   C810 3030        497           LHI   R1,C'00'                                                   ELI04970
0DDA   4010 178E        498           STH   R1,MTESTNO         RESET THESE FLAGS TO C'00'              ELI04980
0DDE   4010 1798        499           STH   R1,ETESTNO                                                 ELI04990
0DE2   4010 179A        500           STH   R1,ERRNO                                                   ELI05000
0DE6   41F0 145A        501           BAL   LINK,LCORE         SET UP LOW CORE                         ELI05010
                        502  *                                                                         ELI05020
                        503  *  START SELECTION FROM TEST 0                                            ELI05030
                        504  *                                                                         ELI05040
0DEA   2400             505  KEEP3    LIS   R0,0                                                       ELI05050
0DEC   4000 175C        506           STH   R0,BTESTNO         RESET BINARY TEST NUMBER                ELI05060
0DF0   4000 1760        507           STH   R0,NEXTST          RESET NEXT TEST #                       ELI05070
                        508  *                                                                         ELI05080
                        509  *  TO FIND THE NEXT SELECTED TEST.                                        ELI05090
                        510  *                                                                         ELI05100
0DF4   4820 1760        511  KEEP4    LH    R2,NEXTST          GET NEXT TEST #                         ELI05110
0DF8   2408             512  KEEP41   LIS   R0,8                                                       ELI05120
0DFA   910C             513           SLHLS R0,12              R0 = X'8000'                            ELI05130
0DFC   CC02 0000        514           SRHL  R0,0(R2)           R0 = NEXT TEST BIT                      ELI05140
0E00   C520 0010        515           CLHI  R2,X'10'           NEXT TEST < 16                          ELI05150
0E04   2185             516           BLS   KEEP42                                                     ELI05160
0E06   4400 1818        517           NH    R0,TEST+8          LOOK AT TEST HW 2                       ELI05170
0E0A   2137             518           BNZS  KEEP5                                                      ELI05180
0E0C   2304             519           BS    KEEP43                                                     ELI05190
0E0E   4400 1816        520  KEEP42   NH    R0,TEST+6          LOOK AT TEST HW 1                       ELI05200
0E12   2133             521           BNZS  KEEP5                                                      ELI05210
0E14   2621             522  KEEP43   AIS   R2,1                                                       ELI05220
0E16   220F             523           BS    KEEP41             LOOP FOR NEXT TEST #                    ELI05230
0E18   4020 175C        524  KEEP5    STH   R2,BTESTNO         CURRENT TEST #                          ELI05240
0E1C   0812             525           LDAR  R1,R2              R1 = TEST # IN BINARY                   ELI05250
0E1E   2621             526           AIS   R2,1                                                       ELI05260
0E20   4020 1760        527           STH   R2,NEXTST                                                  ELI05270
0E24   2402             528           LIS   R0,2               SET DIGITS TO PRINT = 2                 ELI05280
0E26   C820 178E        529           LHI   R2,MTESTNO         R2 = A(MTESTNO)                         ELI05290
0E2A   41F0 1190        530           BAL   LINK,HEXASC        STORE TEST # IN ASCII @ MTESTNO         ELI05300
0E2E   482C 178E        531           LH    R2,MTESTNO                                                 ELI05310
0E32   4020 1798        532           STH   R2,ETESTNO         STORE TEST # IN ASCII @ ETESTNO         ELI05320
0E36   41F0 1358        533           BAL   LINK,TSTBRK        TEST BREAK                              ELI05330
0E3A   C850 1788        534           LHI   R5,TSTMSG                                                  ELI05340
0E3E   41F0 11F0        535           BAL   LINK,PRINT         PRINT 'TEST NN'                         ELI05350
0E42   2400             536           LIS   R0,0                                                       ELI05360
0E44   4000 1750        537           STH   R0,NOERR           RESET ERROR FLAG                        ELI05370
0E48   4000 175E        538           STH   R0,COUNT           RESET COUNT                             ELI05380
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0E4C  4810 0A24      539 KEEP6   LH    R1,PSW2           DISABLE INTERRUPTS                ELI05390
0E50  9501           540         EPSR  R0,R1                                             ELI05400
0E52  4820 175C      541         LH    R2,BTESTNO        R2 = TEST #                     ELI05410
0E56  9121           542         SLLS  R2,LADC                                           ELI05420
0E58  4812 1884      543         LDA   R1,TESTS(R2)                                      ELI05430
0E5C  0301           544         BR    R1                GO TO TEST MODULE               ELI05440
                     545 *---------------------------                                    ELI05450
                     546 *                                                               ELI05460
                     547 *  TEST MODULE END ROUTINE                                      ELI05470
                     548 *                                                               ELI05480
0E5E  4810 0A24      549 TSTEND  LH    R1,PSW2                                           ELI05490
0E62  9501           550         EPSR  R0,R1             DISABLE INT @ PROCESSOR LEVEL   ELI05500
0E64  4800 175E      551         LH    R0,COUNT                                          ELI05510
0E68  2601           552         AIS   R0,1              INCREMENT COUNT                 ELI05520
0E6A  4000 175E      553         STH   R0,COUNT                                          ELI05530
0E6E  4500 1822      554         CLH   R0,LOOP+6         IF COUNT > LOOP,                ELI05540
0E72  2385           555         BNLS  KEEP7             GO TO NEXT TEST MODULE          ELI05550
0E74  41F0 1358      556         BAL   LINK,TSTBRK       IF BREAK GO TO OPTIN            ELI05560
0E78  4300 0E4C      557         B     KEEP6             OTHERWISE, REPEAT SAME TEST     ELI05570
0E7C  4800 1750      558 KEEP7   LH    R0,NOERR          LOOK @ ERROR FLAG               ELI05580
0E80  2135           559         BNZS  KEEP71                                            ELI05590
0E82  C850 17AE      560         LHI   R5,NOERMSG                                        ELI05600
0E86  41F0 11F0      561         BAL   LINK,PRINT        PRINT "NO ERROR"                ELI05610
0E8A  4810 175C      562 KEEP71  LH    R1,BTESTNO        GET TEST #                    ELI05620
0E8E  4510 1752      563         CLH   R1,SELTST         IS THE LAST SELECTED TEST DONE ?ELI05630
0E92  4280 0DF4      564         BL    KEEP4             NO, GO SELECT NEXT TEST       ELI05640
                     565 *                                                               ELI05650
                     566 *  ALL THE SELECTED TESTS HAVE NOW RUN                          ELI05660
                     567 *                                                               ELI05670
0E96  4200 0E96      568 ABORT   NOP   *                   COME HERE TO ABORT TEST SEQUENCE,ELI05680
0E9A  4810 0A24      569         LH    R1,PSW2                                           ELI05690
0E9E  9501           570         EPSR  R0,R1             PSW = 30F0                      ELI05700
0EA0  41F0 13C6      571         BAL   LINK,TSTDU        RETURN WITH R1 = DU BIT         ELI05710
0EA4  4230 0ED4      572         BNZ   KEEP9             IF DU, DISPLAY TOTAL            ELI05720
0EA8  4810 1756      573         LH    R1,WASDU1         WAS IT EVER ?                   ELI05730
0EAC  4230 0F0A      574         BNZ   KEEP10            YES, PRINT TOTAL, TOTERR        ELI05740
0EB0  41F0 1358      575         BAL   LINK,TSTBRK                                       ELI05750
0EB4  4810 182E      576         LH    R1,CONTIN+6       IF CONTIN = 1,                ELI05760
0EB8  4230 0ED8      577         BNZ   ABORT2            INCREMENT & GO TO TEST 0      ELI05770
0EBC  41F0 13FC      578         BAL   LINK,SETKB        KB DEVICE = LIST DEVICE       ELI05780
0EC0  C850 17FE      579         LHI   R5,EOTMSG                                         ELI05790
0EC4  41F0 11F0      580         BAL   LINK,PRINT        'END OF TEST'                   ELI05800
0EC8  48F0 183A      581         LH    LINK,NOMSG+6                                      ELI05810
0ECC  4230 0F04      582         BNZ   KEEP92                                            ELI05820
0ED0  4300 0AF6      583         B     OPTIN                                             ELI05830
                     584 *                                                               ELI05840
                     585 *---------------------------------                             ELI05850
                     586 *  ROUTINE INCREMENTS,DISPLAYS & CHECKS 'TOTAL'                 ELI05860
                     587 *                                                               ELI05870
0ED4  4010 1754      588 KEEP9   STH   R1,WASDU          SET 'WASDU' FLAG                ELI05880
0ED8  4810 1758      589 ABORT2  LH    R1,TOTAL          INCREMENT TOTAL                 ELI05890
0EDC  2611           590         AIS   R1,1                                             ELI05900
0EDE  4010 1758      591         STH   R1,TOTAL                                         ELI05910
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0EE2  4810 1758   KEEP91   LH    R1,TOTAL                                     ELI05920
0EE6  C510 7FFF            CLHI  R1,X'7FFF'      TOTAL < MAX RETAINABLE ?     ELI05930
0EEA  2389                 BNLS  HALT9                                        ELI05940
0EEC  4800 175C            LH    R0,BTESTNO      R0 = CURRENT TEST #          ELI05950
0EF0  4500 1752            CLH   R0,SELTST       IS IT LAST TEST ?            ELI05960
0EF4  4280 0DF4            BL    KEEP4           NO, GO TO NEXT TEST          ELI05970
0EF8  4300 0DEA            B     KEEP3           GO TO TEST 0                 ELI05980
                  *                                                           ELI05990
0EFC  C810 080F   HALT9    LHI   R1,X'80F'                                    ELI06000
0F00  9114                 SLHLS R1,4            (R1) = X'80F0'               ELI06010
0F02  9521                 EPSR  R2,R1           HALT PROCESSOR               ELI06020
                  *                                                           ELI06030
                  *  WHEN EXE/RUN IS PRESSED, PRINT TOTAL & TOTERR            ELI06040
                  *                                                           ELI06050
0F04  41F0 13C6   KEEP92   BAL   LINK,TSTDU      SEE IF LIST DEV IS ON        ELI06060
0F08  2036                 BNZS  HALT9           NO, HALT                     ELI06070
0F0A  2400        KEEP10   LIS   R0,0                                         ELI06080
0F0C  4000 1754            STH   R0,WASDU        RESET FLAG                   ELI06090
0F10  41F0 1274            BAL   LINK,CRLF                                    ELI06100
0F14  C850 179E            LHI   R5,TOTMSG                                    ELI06110
0F18  4050 174E            STH   R5,ISITERR                                   ELI06120
0F1C  41F0 11F0            BAL   LINK,PRINT      PRINT 'TOTAL   TOTERR'       ELI06130
0F20  2404                 LIS   R0,4            TO PRINT 4 HEX DIGITS        ELI06140
0F22  4850 1758            LH    R5,TOTAL                                     ELI06150
0F26  41F0 112A            BAL   LINK,R5HEX      PRINT TOTAL IN HEX           ELI06160
0F2A  2434                 LIS   R3,4                                         ELI06170
0F2C  C840 0020            LHI   R4,C' '         SPACE                        ELI06180
0F30  41F0 1282   KEEP101  BAL   LINK,OUTCHR     OUTPUT IT                    ELI06190
0F34  2731                 SIS   R3,1                                         ELI06200
0F36  2023                 BPS   KEEP101         4 TIMES                      ELI06210
0F38  2404                 LIS   R0,4            TO PRINT 4 HEX DIGITS        ELI06220
0F3A  4850 175A            LH    R5,TOTERR                                    ELI06230
0F3E  41F0 112A            BAL   LINK,R5HEX      PRINT TOTERR IN HEX          ELI06240
0F42  4300 0AF6            B     OPTIN           GO TO BEGINNING              ELI06250
                  ************************************                        ELI06260
                  *                                                           ELI06270
0F46  2401        DISPLAY  LIS   R0,1            DISPLAY PANEL ADDRESS        ELI06280
0F48  DE00 1725            OC    R0,INCR         INCREMENTAL MODE             ELI06290
0F4C  481F 0002            LH    R1,2(LINK)      GET 2ND PARAMETER ADDRESS    ELI06300
0F50  4811 0000            LH    R1,0(R1)        GET DATA                     ELI06310
0F54  9411                 EXBR  R1,R1                                        ELI06320
0F56  9801                 WHR   R0,R1           WRITE DATA                   ELI06330
0F58  481F 0000            LH    R1,0(LINK)      GET 1ST PARAMETER ADDRESS    ELI06340
0F5C  4811 0000            LH    R1,0(R1)        GET DATA                     ELI06350
0F60  9411                 EXBR  R1,R1                                        ELI06360
0F62  9801                 WHR   R0,R1           WRITE DATA TO D1,D2          ELI06370
0F64  DE00 1724            OC    R0,NORM         NORMAL MODE                  ELI06380
0F68  430F 0004            B     4(LINK)         RETURN                       ELI06390
                  *                                                           ELI06400
                  ************************************                        ELI06410
                  *                                                           ELI06420
                  *  ERROR ROUTINES                  (OVERRIDE NOMSG OPTION)  ELI06430
                  *                                                           ELI06440
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EXEC - ETPE R03P4 (W/CONDITIONAL ASSEMBLY)

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0F6C   D000 20F0    ERR      STM   R0,ERRSAVE     STORE REGISTERS                  ELI06450
0F70   4120 0FF6             BAL   R2,ERRCOM      RETURN IF LIST DEVICE IS ON      ELI06460
0F74   41E0 102A             BAL   RET,ERR1       PRINT 'ERROR TTNN'               ELI06470
0F78   2400         ERRCOM2  LIS   R0,0                                            ELI06480
0F7A   4000 174E             STH   R0,ISITERR     RESET ERROR FLAG                 ELI06490
0F7E   4820 0A22             LH    R2,PSW                                          ELI06500
0F82   9502                  EPSR  R0,R2                                           ELI06510
0F84   D100 20F0             LM    R0,ERRSAVE     RESTORE REGISTERS                ELI06520
0F88   030F                  BR    LINK           RETURN TO TEST                   ELI06530
0F8A   D000 20F0    ERRD     STM   R0,ERRSAVE     STORE REGISTERS                  ELI06540
0F8E   4120 0FF6             BAL   R2,ERRCOM      RETURN IF LIST DEVICE IS ON      ELI06550
0F92   41E0 102A             BAL   RET,ERR1       PRINT 'ERROR TTNN'               ELI06560
0F96   41E0 1034             BAL   RET,ERRD1      PRINT 'DEV DDD'                  ELI06570
0F9A   4300 0F78             B     ERRCOM2                                         ELI06580
0F9E   D000 20F0    ERRS     STM   R0,ERRSAVE     STORE REGISTERS                  ELI06590
0FA2   4120 0FF6             BAL   R2,ERRCOM      RETURN IF LIST DEVICE IS ON      ELI06600
0FA6   41E0 102A             BAL   RET,ERR1       PRINT 'ERROR TTNN'               ELI06610
0FAA   41E0 104C             BAL   RET,ERRS1      PRINT 'STA SS'                   ELI06620
0FAE   4300 0F78             B     ERRCOM2                                         ELI06630
0FB2   D000 20F0    ERRDS    STM   R0,ERRSAVE     STORE REGISTERS                  ELI06640
0FB6   4120 0FF6             BAL   R2,ERRCOM      RETURN IF LIST DEVICE IS ON      ELI06650
0FBA   41E0 102A             BAL   RET,ERR1       PRINT 'ERROR TTNN'               ELI06660
0FBE   41E0 1064             BAL   RET,ERRDS1     PRINT 'DEV DDD STA SS'           ELI06670
0FC2   4300 0F78             B     ERRCOM2                                         ELI06680
0FC6   D000 20F0    ERRL     STM   R0,ERRSAVE     STORE REGISTERS                  ELI06690
0FCA   40F0 171E             STH   R15,OLOC       STORE ERROR LOC TO PRINT         ELI06700
0FCE   4120 0FF6             BAL   R2,ERRCOM      RETURN IF LIST DEVICE IS ON      ELI06710
0FD2   41E0 102A             BAL   RET,ERR1       PRINT 'ERROR TTNN'               ELI06720
0FD6   41E0 108A             BAL   RET,ERRL1      PRINT 'LOC LLLL'                 ELI06730
0FDA   4300 0F78             B     ERRCOM2                                         ELI06740
0FDE   D000 20F0    ERRALL   STM   R0,ERRSAVE     STORE REGISTERS                  ELI06750
0FE2   4120 0FF6             BAL   R2,ERRCOM      RETURN IF LIST DEVICE IS ON      ELI06760
0FE6   41E0 102A             BAL   RET,ERR1       PRINT 'ERROR TTNN'               ELI06770
0FEA   41E0 1064             BAL   RET,ERRDS1     PRINT 'DEV DDD STA SS'           ELI06780
0FEE   41E0 10A2             BAL   RET,ERRPL1     PRINT 'PSW PPPP  LOC LLLL'       ELI06790
0FF2   4300 0F78             B     ERRCOM2                                         ELI06800
                    *                                                              ELI06810
                    *  COMMON ERROR ROUTINE                                        ELI06820
                    *                                                              ELI06830
0FF6   4020 176C    ERRCOM   STA   R2,COMRET      STORE RETURN ADDRESS             ELI06840
0FFA   4810 0A24             LH    R1,PSW2                                         ELI06850
0FFE   9501                  EPSR  R0,R1          DISABLE INT. @ PROCESSOR LEVEL   ELI06860
1000   41F0 13C6             BAL   LINK,TSTDU     GET LIST DEVICE DU BIT IN R1     ELI06870
1004   2138                  BNZS  ERRCOM1        BRANCH IF OFF-LINE               ELI06880
1006   4020 174E             STH   R2,ISITERR     SET ERROR FLAG                   ELI06890
100A   4020 1750             STH   R2,NOERR                                        ELI06900
100E   4820 176C             LDA   R2,COMRET                                       ELI06910
1012   0302                  BR    R2             GO, PRINT ERROR MESSAGE          ELI06920
                    *                                                              ELI06930
1014   4810 175A    ERRCOM1  LH    R1,TOTERR      LIST DEVICE IS OFF               ELI06940
1018   2611                  AIS   R1,1                                            ELI06950
101A   4010 175A             STH   R1,TOTERR      INCREMENT TOTERR                 ELI06960
101E   C510 7FFF             CLHI  R1,X'7FFF'     TOTERR < MAX RETAINABLE ?        ELI06970
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1022  4280 0EE2   698          BL    KEEP91            NO, ABORT CURRENT TEST & GOTO NEXT     ELI06980
1026  4300 0EFC   699          B     HALT9             YES, HALT PROCESSOR                    ELI06990
                  700  *-----------------------------                                          ELI07000
                  701  * MESSAGE PRINT ROUTINES        (DO NOT OVERRIDE NOMSG OPTION)         ELI07010
                  702  *                                                                       ELI07020
                  703  *  TO PRINT 'ERROR TTNN'                                                ELI07030
                  704  *                                                                       ELI07040
102A  C850 1792   705  ERR1     LHI   R5,ERRMSG                                               ELI07050
102E  41F0 11F0   706          BAL   LINK,PRINT          PRINT 'ERROR TTNN'                     ELI07060
                  707  *                               TT = TEST #, NN = ERROR #              ELI07070
1032  030E        708          BR    RET                 RETURN                               ELI07080
                  709  *                                                                       ELI07090
                  710  *  TO PRINT 'DEV DDD'                                                   ELI07100
                  711  *                                                                       ELI07110
1034  2403        712  ERRD1    LIS   R0,3                SET UP DIGITS = 3                    ELI07120
1036  4810 1720   713          LH    R1,ERRDEV           R1 = ERROR DEV # IN BINARY           ELI07130
103A  C820 17CC   714          LHI   R2,ASCIDEV2                                             ELI07140
103E  41F0 1190   715          BAL   LINK,HEXASC         CONVERT IT TO ASCII                  ELI07150
1042  C850 17C8   716          LHI   R5,DEVMSG2                                              ELI07160
1046  41F0 11F0   717          BAL   LINK,PRINT          PRINT 'DEV DD'                       ELI07170
104A  030E        718          BR    RET                 RETURN                               ELI07180
                  719  *                                                                       ELI07190
                  720  *  TO PRINT 'STA SS'                                                    ELI07200
                  721  *                                                                       ELI07210
104C  2402        722  ERRS1    LIS   R0,2                SET UP DIGITS = 2                    ELI07220
104E  D310 1722   723          LB    R1,ERRSTA           R1 = ERROR STATUS                    ELI07230
1052  C820 17C4   724          LHI   R2,ASCISTA                                              ELI07240
1056  41F0 1190   725          BAL   LINK,HEXASC         CONVERT IT TO ASCII                  ELI07250
105A  C850 17C0   726          LHI   R5,STAMSG                                               ELI07260
105E  41F0 11F0   727          BAL   LINK,PRINT          PRINT 'STA SS'                       ELI07270
1062  030E        728          BR    RET                 RETURN                               ELI07280
                  729  *                                                                       ELI07290
                  730  *  TO PRINT 'DEV DDD STA SS'                                            ELI07300
                  731  *                                                                       ELI07310
1064  2403        732  ERRDS1   LIS   R0,3                SET UP DIGITS = 3                    ELI07320
1066  4810 1720   733          LH    R1,ERRDEV           R1 = ERROR DEV #                     ELI07330
106A  C820 17BC   734          LHI   R2,ASCIDEV                                              ELI07340
106E  41F0 1190   735          BAL   LINK,HEXASC         CONVERT IT TO ASCII                  ELI07350
1072  2402        736          LIS   R0,2                SET UP DIGITS = 2                    ELI07360
1074  D310 1722   737          LB    R1,ERRSTA           R1 = ERROR STATUS                    ELI07370
1078  C820 17C4   738          LHI   R2,ASCISTA                                              ELI07380
107C  41F0 1190   739          BAL   LINK,HEXASC         CONVERT IT TO ASCII                  ELI07390
1080  C850 17B8   740          LHI   R5,DEVMSG                                               ELI07400
1084  41F0 11F0   741          BAL   LINK,PRINT          PRINT 'DEV DD STA SS'                ELI07410
1088  030E        742          BR    RET                 RETURN                               ELI07420
                  743  *                                                                       ELI07430
                  744  *  TO PRINT 'LOC LLLL'                                                  ELI07440
                  745  *                                                                       ELI07450
108A  2404        746  ERRL1    LIS   R0,4                SET UP DIGITS = 4                    ELI07460
108C  4810 171E   747          LH    R1,OLOC             R1= OLD LOC                          ELI07470
1090  C820 17E0   748          LHI   R2,ASCILOC                                              ELI07480
1094  41F0 1190   749          BAL   LINK,HEXASC         CONVERT IT TO ASCII                  ELI07490
1098  C850 17DC   750          LHI   R5,LOCMSG                                               ELI07500
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109C   41F0 11F0          751           BAL   LINK,PRINT          PRINT 'LOC LLLL'                ELI07510
10A0   030E               752           BR    RET                 RETURN                          ELI07520
                          753  *                                                                  ELI07530
                          754  *  TO PRINT 'PSW PPPP  LOC LLLL'                                   ELI07540
                          755  *                                                                  ELI07550
10A2   2404               756  ERRPL1   LIS   R0,4                SET UP DIGITS = 4               ELI07560
10A4   4810 171A          757           LH    R1,OPSW             R1 = OLD PSW                    ELI07570
10A8   C820 17D6          758           LHI   R2,ASCIPSW                                          ELI07580
10AC   41F0 1190          759           BAL   LINK,HEXASC         CONVERT IT TO ASCII             ELI07590
10B0   4810 171E          760           LH    R1,OLOC             R1= OLD LOC                     ELI07600
10B4   C820 17E0          761           LHI   R2,ASCILOC                                          ELI07610
10B8   41F0 1190          762           BAL   LINK,HEXASC         CONVERT IT TO ASCII             ELI07620
10BC   C850 17D2          763           LHI   R5,PSWMSG                                          ELI07630
10C0   41F0 11F0          764           BAL   LINK,PRINT          PRINT 'PSW PPPP  LOC LLLL'      ELI07640
10C4   030E               765           BR    RET                 RETURN                          ELI07650
                          766  * ********************************                                ELI07660
                          767  *  TO OBTAIN OPTION VALUE IN R6    (16 BITS, TARGT 16)             ELI07670
                          768  *                                                                  ELI07680
10C6   2460               769  OPTVAL   LIS   R6,0               INITIALIZE ACCUMULATOR          ELI07690
10C8   41F0 1310          770           BAL   R15,GETCHR          GET A CHAR IN R4                ELI07700
10CC   24FF               771  OPTVAL0  LIS   R15,15                                             ELI07710
10CE   D44F 1778          772  OPTVAL1  CLB   R4,HEXTAB(R15)     SCAN TABLE                      ELI07720
10D2   2334               773           BES   OPTVAL2            MATCH                           ELI07730
10D4   27F1               774           SIS   R15,1                                             ELI07740
10D6   2214               775           BNMS  OPTVAL1                                           ELI07750
10D8   030C               776           BR    R12                 ERROR: VALUE NOT IN TABLE.      ELI07760
10DA   9164               777  OPTVAL2  SLLS  R6,4                SHIFT LEFT 4                    ELI07770
10DC   066F               778           OAR   R6,R15              OR IN CURRENT DIGIT             ELI07780
10DE   41F0 1310          779  OPTVAL3  BAL   R15,GETCHR          GET NEXT CHAR                   ELI07790
10E2   C540 005F          780           CLHI  R4,X'5F'            IS IT LEFT ARROW ?              ELI07800
10E6   2334               781           BES   OPTVAL5             YES, BRANCH                     ELI07810
10E8   C540 0008          782           CLHI  R4,X'08'            BACK SPACE ?                    ELI07820
10EC   2133               783           BNES  OPTVAL4             NO, BRANCH                      ELI07830
10EE   9064               784  OPTVAL5  SRLS  R6,4                THROW AWAY LAST HEX ENTRY       ELI07840
10F0   2209               785           BS    OPTVAL3                                           ELI07850
10F2   C540 000D          786  OPTVAL4  CLHI  R4,13               EXIT IF CR                      ELI07860
10F6   033E               787           BER   R14                                               ELI07870
10F8   C540 002C          788           CLHI  R4,X'2C'            OR COMMA                        ELI07880
10FC   4230 10CC          789           BNE   OPTVAL0             LOOP TO PROCESS                 ELI07890
1100   030E               790           BR    R14                 RETURN                          ELI07900
                          791  *--------------------------------                                 ELI07910
                          792  * TO CONVERT (R6) FROM BINARY TO UNARY PATTERN, IN R3              ELI07920
                          793  *                                                                  ELI07930
1102   2431               794  UNARY    LIS   R3,1                INITIALIZE                      ELI07940
1104   C560 000F          795  UNARY1   CLHI  R6,15               DONE ?                          ELI07950
1108   033E               796           BER   R14                 RETURN                          ELI07960
110A   0A33               797           AAR   R3,R3               NO, SHIFT R3,                   ELI07970
110C   2661               798           AIS   R6,1                INCREMENT COUNTER               ELI07980
110E   2205               799           BS    UNARY1                                            ELI07990
                          800  *-----------------------------                                    ELI08000
                          801  *  TO PROVIDE # OF MILLISECONDS DELAY SPECIFIED BY R0             ELI08010
                          802  *                                                                  ELI08020
1110   D000 2030          803  TIMER    STM   R0,RSAVE            SAVE REGISTERS                  ELI08030
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1114  2410            804  $TIMER1  LIS   R1,0                                    ELI08040
1116  2421            805           LIS   R2,1                                    ELI08050
1118  4830 0A1E       806           LH    R3,TIME          R3 = TIME CONSTANT FOR 1 MS DELAY  ELI08060
111C  C110 111C       807           BXLE  R1,*                                    ELI08070
1120  2701            808           SIS   R0,1                                    ELI08080
1122  2037            809           BNZS  $TIMER1          LOOP TILL SPECIFIED DELAY  ELI08090
1124  D100 2030       810           LM    R0,RSAVE         RESTORE REGISTERS      ELI08100
1128  030F            811  $TIMXT   BR    LINK             RETURN                 ELI08110
                      812  *--------------------------                             ELI08120
                      813  *  R5HEX PRINTS CONTENTS OF R5 IN HEX                   ELI08130
                      814  *        PRINTS UPTO 4 DIGITS     (8 DIGITS, TARGT 32)  ELI08140
                      815  *                                                       ELI08150
112A  D000 2030       816  R5HEX    STM   R0,RSAVE         STORE REGISTERS        ELI08160
112E  0820            817           LOAR  R2,R0            R2 = # OF DIGITS TO BE PRINTED  ELI08170
1130  2721            818           SIS   R2,1                                    ELI08180
1132  4210 114E       819           BM    R5XB                                    ELI08190
1136  9122            820           SLLS  R2,2             R2 = 4(DIGITS-1)       ELI08200
1138  0845            821  R5X      LOAR  R4,R5                                   ELI08210
113A  CC42 0000       822           SRAL  R4,0(R2)                                ELI08220
113E  C440 000F       823           NHI   R4,15            R4 = HEX DIGIT         ELI08230
1142  D344 1778       824           LB    R4,HEXTAB(R4)                           ELI08240
1146  41F0 1282       825  R5XA     BAL   R15,OUTCHR                              ELI08250
114A  2724            826           SIS   R2,4                                    ELI08260
114C  221A            827           BNMS  R5X              LOOP TILL ALL DIGITS   ELI08270
114E  D100 2030       828  R5XB     LM    R0,RSAVE         RESTORE REGISTERS      ELI08280
1152  030F            829           BR    LINK             RETURN                 ELI08290
                      830  *--------------------------                             ELI08300
                      831  *  R5BIN PRINTS CONTENTS OF R5 IN BINARY                ELI08310
                      832  *        PRINTS UPTO 16 DIGITS                          ELI08320
                      833  *                                                       ELI08330
1154  D000 2030       834  R5BIN    STM   R0,RSAVE         STORE REGISTERS        ELI08340
1158  0830            835           LOAR  R3,R0            R3 = # OF DIGITS TO BE PRINTED  ELI08350
115A  C810 0010       836           LHI   R1,16                                   ELI08360
115E  0B13            837           SAR   R1,R3                                   ELI08370
1160  211C            838           BMS   R5B2             EXIT                   ELI08380
1162  CD51 0000       839           SLHL  R5,0(R1)         R5 = DATA TO BE PRINTED  ELI08390
1166  C840 0030       840  R5B      LHI   R4,C'0'                                 ELI08400
116A  9151            841           SLHLS R5,1                                    ELI08410
116C  2382            842           BNCS  R5B1                                    ELI08420
116E  2641            843           AIS   R4,1             IF CARRY, PRINT 1      ELI08430
1170  41F0 1282       844  R5B1     BAL   LINK,OUTCHR                             ELI08440
1174  2731            845           SIS   R3,1             R3 = # OF REMAINING DIGITS  ELI08450
1176  2124            846           BPS   R5B3                                    ELI08460
1178  D100 2030       847  R5B2     LM    R0,RSAVE         RESTORE REGISTERS      ELI08470
117C  030F            848           BR    LINK             RETURN                 ELI08480
117E  C330 0003       849  R5B3     THI   R3,3             4,8 OR 12 DIGITS LEFT ?  ELI08490
1182  2135            850           BNZS  R5B4             NO                     ELI08500
1184  C840 0020       851           LHI   R4,C' '          YES, OUTPUT ONE SPACE  ELI08510
1188  41F0 1282       852           BAL   R15,OUTCHR                              ELI08520
118C  4300 1166       853  R5B4     B     R5B              LOOP FOR NEXT DIGIT    ELI08530
                      854  *--------------------------                             ELI08540
                      855  *  TO CONVERT HEXADECIMAL DATA IN R1 TO ASCII CHAR & STORE @ 0(R2)  ELI08550
                      856  *                                                       ELI08560
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1190  D000 2030          857  HEXASC   STM   R0,RSAVE          STORE REGISTERS                    ELI08570
1194  0830               858           LDAR  R3,R0             R3 = DIGITS                        ELI08580
1196  9132               859           SLLS  R3,2                                                 ELI08590
1198  2734               860           SIS   R3,4              R3 = 4(DIGITS)-4                   ELI08600
119A  0841               861  HEXASC1  LDAR  R4,R1             R4 = HEX DATA                      ELI08610
119C  CC43 0000          862           SRAL  R4,0(R3)                                             ELI08620
11A0  C440 000F          863           NHI   R4,15             R4 = HEX DIGIT TO BE CONVERTED     ELI08630
11A4  D344 1778          864           LB    R4,HEXTAB(R4)                                        ELI08640
11A8  D242 0000          865           STB   R4,0(R2)          STORE ASCII CHAR                   ELI08650
11AC  2621               866           AIS   R2,1                                                 ELI08660
11AE  2734               867           SIS   R3,4                                                 ELI08670
11B0  221B               868           BNMS  HEXASC1           LOOP TILL ALL DIGITS               ELI08680
11B2  D100 2030          869           LM    R0,RSAVE          RESTORE REGISTERS                  ELI08690
11B6  030F               870           BR    LINK              RETURN                             ELI08700
                         871  *----------------------------                                       ELI08710
                         872  *  TO CONVERT BINARY DATA IN R1 INTO DECIMAL DIGITS                  ELI08720
                         873  *     AND STORE THEM IN ASCII @ 0(R2)                                ELI08730
                         874  *                                                                    ELI08740
11B8  D000 2030          875  DECASC   STM   R0,RSAVE                                            ELI08750
11BC  0830               876           LDAR  R3,R0             COPY DIGIT COUNT                   ELI08760
11BE  9131               877           SLLS  R3,LADC           &ESTABLISH DECTAB INDEX.           ELI08770
11C0  2732               878           SIS   R3,ADC                                               ELI08780
11C2  2440               879  $DEC1    LIS   R4,0              CLEAR MODULUS COUNTER              ELI08790
11C4  4853 176E          880           LDA   R5,DECTAB(R3)     LOAD LARGEST REQ. POWER OF 10.     ELI08800
11C8  0515               881  $DEC2    CLAR  R1,R5             EXCEEDS TEST VALUE ?               ELI08810
11CA  2188               882           BLS   $DEC3             BRANCH IF YES.                     ELI08820
11CC  0B15               883           SAR   R1,R5             DECREMENT TEST VALUE               ELI08830
11CE  2641               884           AIS   R4,1              INCREMENT MODULUS COUNTER          ELI08840
11D0  C540 000A          885           CLHI  R4,10             VALID DECIMAL DIGIT ?              ELI08850
11D4  2086               886           BLS   $DEC2             BRANCH IF YES; ELSE                ELI08860
11D6  274A               887           SIS   R4,10             FORCE VALID DIGIT.                 ELI08870
11D8  2208               888           BS    $DEC2             REPEAT DECREMENT.                  ELI08880
11DA  D344 1778          889  $DEC3    LB    R4,HEXTAB(R4)     CONVERT MODULUS COUNT TO ASCII     ELI08890
11DE  D242 0000          890           STB   R4,0(R2)          AND STORE AT DESTINATION MSB.      ELI08900
11E2  2621               891           AIS   R2,1              INCREMENT DESTINATION POINTER      ELI08910
11E4  2732               892           SIS   R3,ADC            DECREMENT DECTAB POINTER           ELI08920
11E6  4310 11C2          893           BNM   $DEC1             FALL THROUGH ON DECTAB UNDERFLOW.  ELI08930
11EA  D100 2030          894           LM    R0,RSAVE          RESTORE USER'S REGISTERS           ELI08940
11EE  030F               895           BR    LINK              RETURN.                            ELI08950
                         896  *----------------------------                                       ELI08960
                         897  *  TO PRINT THE ASCII MESSAGE                                       ELI08970
                         898  *                                                                    ELI08980
11F0  D000 2030          899  PRINT    STM   R0,RSAVE          STORE REGISTERS                    ELI08990
11F4  41F0 13C6          900           BAL   LINK,TSTDU                                           ELI09000
11F8  2335               901           BZS   P1                                                   ELI09010
11FA  4010 1754          902           STH   R1,WASDU          SET FLAG                           ELI09020
11FE  4300 126A          903           B     PRINT5            EXIT                               ELI09030
1202  4820 1754          904  P1       LH    R2,WASDU                                             ELI09040
1206  4330 1234          905           BZ    P3                                                   ELI09050
120A  C810 0140          906           LHI   R1,X'140'         DELAY CONSTANT                     ELI09060
120E  C800 1000          907           LHI   R0,X'1000'                                           ELI09070
1212  2701               908           SIS   R0,1                                                 ELI09080
1214  2031               909           BTBS  3,1                                                  ELI09090
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1216  2711            910          SIS   R1,1                                ELI09100
1218  2035            911          BTBS  3,5                LOOP TILL TIMEOUT ELI09110
                      912  *                                 (20 SEC FOR CRT WARM-UP) ELI09120
121A  2440            913          LIS   R4,0                                ELI09130
121C  4040 1754       914          STH   R4,WASDU                            ELI09140
1220  2541            915          LCS   R4,1                CHARACTER = X'FF' ELI09150
1222  4040 1756       916          STH   R4,WASDU1                           ELI09160
1226  2434            917          LIS   R3,4                                ELI09170
1228  41F0 1282       918  P2      BAL   LINK,OUTCHR                         ELI09180
122C  2731            919          SIS   R3,1                                ELI09190
122E  2023            920          BPS   P2                                  ELI09200
1230  4300 0F0A       921          B     KEEP10              PRINT TOTAL, TOTERR ELI09210
1234  4800 183A       922  P3      LH    R0,NOMSG+6                          ELI09220
1238  2335            923          BZS   PRINT2              NO, PRINT ALL MESSAGES ELI09230
123A  4800 174E       924          LH    R0,ISITERR                          ELI09240
123E  4330 126A       925          BZ    PRINT5              NOT AN ERROR MSG. EXIT ELI09250
                      926  *                                                 ELI09260
1242  0345 0000       927  PRINT2   LB    R4,0(R5)            GET A MESSAGE BYTE ELI09270
1246  41F0 1282       928          BAL   LINK,OUTCHR         OUTPUT IT         ELI09280
124A  274D            929          SIS   R4,13               CR ?              ELI09290
124C  2333            930          BZS   PRINT3              MSG OVER          ELI09300
124E  2651            931          AIS   R5,1                                ELI09310
1250  2207            932          BS    PRINT2              LOOP FOR NEXT CHAR ELI09320
1252  244A            933  PRINT3   LIS   R4,10               LF                ELI09330
1254  0310 2021       934          LB    R1,IOSAVE+1         GET LIST DEV IDENTIFIER ELI09340
1258  2713            935          SIS   R1,3                LINE PRINTER ?    ELI09350
125A  2335            936          BZS   PRINT3A             BRANCH IF YES.    ELI09360
125C  41F0 1282       937          BAL   LINK,OUTCHR         LF                ELI09370
1260  2541            938          LCS   R4,1                DEL               ELI09380
1262  2302            939          BS    PRINT3B                               ELI09390
1264  2441            940  PRINT3A  LIS   R4,1                YES, OUTPUT X'01' ELI09400
1266  41F0 1282       941  PRINT3B  BAL   LINK,OUTCHR         TERMINAL CHARACTER ELI09410
126A  41F0 1358       942  PRINT5   BAL   LINK,TSTBRK                        ELI09420
126E  D100 2030       943          LM    R0,RSAVE            RESTORE REGISTERS ELI09430
1272  030F            944          BR    LINK                RETURN            ELI09440
                      945  *--------------------------------                  ELI09450
                      946  *  SMALL SUPPORT ROUTINES                          ELI09460
                      947  *                                                  ELI09470
                      948  *  TO OUTPUT CR,LF TO LIST DEVICE                  ELI09480
                      949  *                                                  ELI09490
1274  D000 2030       950  CRLF     STM   R0,RSAVE            STORE REGISTERS   ELI09500
1278  244D            951          LIS   R4,13                               ELI09510
127A  41F0 1282       952          BAL   LINK,OUTCHR          OUTPUT CR         ELI09520
127E  4300 1252       953          B     PRINT3               LINE FEED, RESTORE, RETURN ELI09530
                      954  *----------------------------                     ELI09540
                      955  *  TO OUTPUT A CHARACTER TO THE LIST DEVICE         ELI09550
1282  40F0 1766       956  OUTCHR   STA   R15,OUT.SAV         SAVE RETURN ADDRESS ELI09560
1286  D300 2021       957          LB    R0,IOSAVE+1                         ELI09570
1288  2704            958          SIS   R0,4                                ELI09580
128C  4230 12CA       959          BNZ   OUTCHR2              BRANCH IF NOT CAROUSEL ELI09590
1290  4000 1764       960          STH   R0,PAUSE                            ELI09600
1294  41F0 13C6       961  OTC.0    BAL   LINK,TSTDU           ON LINE ?         ELI09610
1298  4230 1306       962          BNZ   OUT0                NO, BRANCH        ELI09620
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129C   9D01                        SSR   R0,R1            GET CAROUSEL STATUS               ELI09630
129E   2386                        BFFS  8,OTC.2          BRANCH IF CHAR. IS TO BE READ     ELI09640
12A0   4810 1764         OTC.1     LH    R1,PAUSE         PAUSED NOW ?                      ELI09650
12A4   2038                        BNZS  OTC.0            YES, LOOP                         ELI09660
12A6   4300 12CA                   B     OUTCHR2          NO, GO OUTPUT CHARACTER           ELI09670
12AA   9B01              OTC.2     RDR   R0,R1            GET CAROUSEL CHARACTER            ELI09680
12AC   C410 007F                   NHI   R1,X'7F'                                           ELI09690
12B0   CB10 0012                   SHI   R1,X'12'         DC2 ?                             ELI09700
12B4   2134                        BNZS  OTC.3                                              ELI09710
12B6   4010 1764                   STH   R1,PAUSE                                           ELI09720
12BA   2308                        BS    OUTCHR2                                            ELI09730
12BC   2712              OTC.3     SIS   R1,2             DC4 ?                             ELI09740
12BE   4230 1294                   BNZ   OTC.0            NO, GO WAIT FOR DC2               ELI09750
12C2   40F0 1764                   STH   LINK,PAUSE                                         ELI09760
12C6   4300 1294                   B     OTC.0                                              ELI09770
                         *                                                                  ELI09780
12CA   4010 1764         OUTCHR2   STH   R1,PAUSE         RESET FLAG                        ELI09790
12CE   41F0 13C6                   BAL   LINK,TSTDU       OFF-LINE ?                        ELI09800
12D2   4230 1306                   BNZ   OUT0             BRANCH IF OFF-LINE                ELI09810
12D6   4110 1442                   BAL   R1,SETUP         SET UP FOR OUTPUT                 ELI09820
12DA   9D01              OTC.4     SSR   R0,R1            WAIT FOR NOT BUSY                 ELI09830
12DC   4230 1306                   BTC   3,OUT0           BRANCH IF OFF-LINE                ELI09840
12E0   C510 000C                   CLHI  R1,12            PASLA OFFLINE ?                   ELI09850
12E4   4330 1306                   BE    OUT0             BRANCH: YES.                      ELI09860
12E8   C310 0008                   THI   R1,8             BUSY ?                            ELI09870
12EC   2039                        BNZS  OTC.4            WAIT FOR NOT BUSY.                ELI09880
12EE   9A04                        WDR   R0,R4            OUTPUT DATA BYTE                  ELI09890
12F0   41F0 13C6         OTC.5     BAL   LINK,TSTDU                                         ELI09900
12F4   2139                        BNZS  OUT0                                               ELI09910
12F6   D310 2021                   LB    R1,IOSAVE+1                                        ELI09920
12FA   9111                        SLHLS R1,1                                               ELI09930
12FC   D301 0A11                   LB    R0,IO+1(R1)      GET CONSOLE WRITE ADDRESS         ELI09940
1300   9D01                        SSR   R0,R1                                              ELI09950
1302   2089                        BTBS  8,OTC.5          WAIT FOR BUSY TO DROP             ELI09960
1304   2303                        BS    OUT1                                               ELI09970
1306   4010 1754         OUT0      STH   R1,WASDU         SET FLAG                          ELI09980
130A   48F0 1766         OUT1      LDA   R15,OUT.SAV                                        ELI09990
130E   030F                        BR    R15              RETURN AS SET UP ABOVE            ELI10000
                         *-----------------------------                                     ELI10010
                         *  TO GET A CHAR FROM KEYBOARD (IN REG R4)                         ELI10020
                         *                                                                  ELI10030
1310   4140 140A         GETCHR    BAL   R4,KBREAD        PUT KB DEVICE IN READ MODE        ELI10040
1314   0890                        LDAR  R9,R0            SAVE CONSOLE ADDRESS              ELI10050
1316   9D04                        SSR   R0,R4                                              ELI10060
1318   2081                        BTBS  8,1              IF BUSY, LOOP (POSSIBLE HANG)     ELI10070
131A   9B04                        RDR   R0,R4            READ A CHAR IN R4                 ELI10080
                         * TO ECHO RECEIVED CHARACTERS TO CONSOLE DEVICE IN FDX MODE        ELI10090
131C   D400 0A1A         ECHO      CLB   R0,MICROBUS                                        ELI10100
1320   233B                        BES   ECHO1            IF MICROBUS, BRANCH               ELI10110
1322   D390 172C                   LB    R9,CONRD                                           ELI10120
1326   C590 00A9                   CLHI  R9,X'A9'         CAROUSEL ?                        ELI10130
132A   2137                        BNES  ECHRTN           DO NOT ECHO                       ELI10140
132C   D390 172B                   LB    R9,CONADR+1                                        ELI10150
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1330  DD90 1723          1016          SS    R9,SINK                                  ELI10160
1334  2082               1017          BTBS  8,2                                      ELI10170
1336  9A94               1018  ECHO1   WDR   R9,R4          ECHO RECEIVED BYTE       ELI10180
1338  C440 007F          1019  ECHRTN  NHI   R4,X'7F'       REMOVE PARITY BIT        ELI10190
133C  030F               1020          BR    LINK           RETURN                   ELI10200
                         1021  *--------------------------                           ELI10210
                         1022  *  TO OUTPUT '?' TO CONSOLE                           ELI10220
                         1023  *                                                     ELI10230
133E  41F0 1274          1024  QUESTN  BAL   LINK,CRLF                              ELI10240
1342  40F0 174E          1025          STH   LINK,ISITERR     SET FLAG                 ELI10250
1346  C850 180C          1026          LHI   R5,QMSG                                  ELI10260
134A  41F0 11F0          1027          BAL   LINK,PRINT       PRINT '?'                ELI10270
134E  2400               1028          LIS   R0,0                                     ELI10280
1350  4000 174E          1029          STH   R0,ISITERR                               ELI10290
1354  4300 0AFA          1030          B     OPTIN1           TO ACCEPT COMMAND INPUT  ELI10300
                         1031  *--------------------------                           ELI10310
                         1032  * IF BREAK KEY DEPRESSED, GO TO 'OPTIN' OR (BRKVECT); ELSE RETURN.  ELI10320
                         1033  *                                                     ELI10330
1358  D000 2070          1034  TSTBRK  STM   R0,RSAVE+64    STORE REGISTERS          ELI10340
135C  40F0 1768          1035          STA   LINK,BRK.SAV     SAVE RETURN ADDRESS      ELI10350
1360  D300 172A          1036          LB    R0,CONADR        GET KEYBOARD DEVICE ADDRESS  ELI10360
1364  9D01               1037          SSR   R0,R1                                    ELI10370
1366  C310 0020          1038          THI   R1,X'20'         'BREAK' KEY PRESSED ?    ELI10380
136A  4330 13B6          1039          BZ    TSTBRK3          NO, EXIT                 ELI10390
136E  D320 0A10          1040          LB    R2,IO                                    ELI10400
1372  C520 0005          1041          CLHI  R2,5             IS IT MICROBUS ?         ELI10410
1376  2139               1042          BNES  TSTBRK4          NO, BRANCH               ELI10420
1378  9B02               1043  TSTBRK5 RDR   R0,R2                                    ELI10430
137A  9D01               1044          SSR   R0,R1                                    ELI10440
137C  C310 0020          1045          THI   R1,X'20'                                 ELI10450
1380  4230 1378          1046          BNZ   TSTBRK5          WAIT FOR BREAK KEY RELEASE  ELI10460
1384  4300 13AA          1047          B     TSTBRK2                                  ELI10470
1388  4820 1726          1048  TSTBRK4 LH    R2,PASFLG        PASLA ?                  ELI10480
138C  233B               1049          BZS   TSTBRK1          BRANCH IF NO,            ELI10490
138E  C310 0008          1050          THI   R1,8             ALREADY ACKNOWLEDGED ?   ELI10500
1392  4230 13B6          1051          BNZ   TSTBRK3          BRANCH IF YES            ELI10510
1396  9B02               1052          RDR   R0,R2                                    ELI10520
1398  9D01               1053          SSR   R0,R1                                    ELI10530
139A  2281               1054          BFBS  8,1                                      ELI10540
139C  0822               1055          LDAR  R2,R2            ZERO CHARACTER ?         ELI10550
139E  213C               1056          BNZS  TSTBRK3          NO, BRANCH: JUST FRAMING ERROR  ELI10560
13A0  2305               1057          BS    TSTBRK2          YES, BRANCH: TRUE BREAK  ELI10570
13A2  9D01               1058  TSTBRK1 SSR   R0,R1                                    ELI10580
13A4  C310 0020          1059          THI   R1,X'20'                                 ELI10590
13A8  2033               1060          BNZS  TSTBRK1          WAIT FOR BREAK KEY RELEASE  ELI10600
13AA  48F0 174C          1061  TSTBRK2 LH    R15,BRKVECT      CHECK FOR SPECIAL ROUTINE  ELI10610
13AE  4330 0AF6          1062          BZ    OPTIN            BRK W/NO VECTOR: BRANCH TO EXEC  ELI10620
13B2  40F0 1768          1063          STA   R15,BRK.SAV      SET UP FOR EXIT          ELI10630
13B6  2400               1064  TSTBRK3 LIS   R0,0                                     ELI10640
13B8  4000 174C          1065          STH   R0,BRKVECT       DELETE VECTOR AFTER ONE SHOT,  ELI10650
13BC  D100 2070          1066          LM    R0,RSAVE+64      RESTORE REGISTERS        ELI10660
13C0  48F0 1768          1067          LDA   LINK,BRK.SAV                             ELI10670
13C4  030F               1068          BR    LINK             RETURN TO PROGRAM        ELI10680
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                   *----------------------------                                       ELI10690
                   * SEE IF CURRENT LIST DEVICE IS OFF-LINE (R1 & CC NON-ZERO IF OFF)  ELI10700
                   *                                                                   ELI10710
13C6  2401         TSTDU     LIS   R0,1            SET CLI STATUS MASK                 ELI10720
13C8  4810 1728              LH    R1,PASFLG2      LIST DEVICE ON PASLA ?              ELI10730
13CC  2333                   BZS   $TSTDU0         BRANCH: NO.                         ELI10740
13CE  C800 00FC              LHI   R0,X'FC'        SET PASLA STATUS MASK               ELI10750
13D2  D310 2021    $TSTDU0   LB    R1,IOSAVE+1     GET I/O POINTER FOR LIST DEVICE     ELI10760
13D6  9111                   SLHLS R1,1                                                ELI10770
13D8  D311 0A10              LB    R1,IO(R1)       GET DEVICE ADDRESS                  ELI10780
13DC  D210 1723              STB   R1,SINK         AND SAVE IT                         ELI10790
13E0  9D11                   SSR   R1,R1           GET LIST DEVICE STATUS              ELI10800
13E2  0410                   NAR   R1,R0           MASK OFF UNWANTED BITS              ELI10810
13E4  C310 0001              THI   R1,1            DU FOR CLI ?                        ELI10820
13E8  2135                   BNZS  $TSTDU2         BRANCH: YES.                        ELI10830
13EA  C510 000C              CLHI  R1,X'0C'        DU FOR PASLA ?                      ELI10840
13EE  2332                   BES   $TSTDU2         BRANCH: YES.                        ELI10850
13F0  2511         $TSTDU1   LCS   R1,1            "NOT DU" EXIT: R1=CC=0              ELI10860
13F2  C710 FFFF    $TSTDU2   XHI   R1,-1           "DU" EXIT: R1=CC<>0                 ELI10870
13F6  D300 1723              LB    R0,SINK         PUT DEVICE ADDRESS IN R0            ELI10880
13FA  030F                   BR    LINK            RETURN                              ELI10890
                   * --------------------------------                                  ELI10900
                   * TO DIRECT INPUT AND OUTPUT TO CONSOLE DEVICE                      ELI10910
                   *                                                                   ELI10920
13FC  D300 0A10    SFTKB     LB    R0,IO           GET KEYBOARD DEVICE                 ELI10930
1400  9410                   EXBR  R1,R0                                               ELI10940
1402  0610                   OAR   R1,R0                                               ELI10950
1404  4010 2020              STH   R1,IOSAVE       KB DEVICE = LIST DEVICE  ***        ELI10960
1408  030F                   BR    LINK            RETURN                              ELI10970
                   *----------------------------                                       ELI10980
                   *  TO PUT KEYBOARD DEVICE IN READ MODE                              ELI10990
                   *                                                                   ELI11000
140A  D300 172A    KBREAD    LB    R0,CONADR                                           ELI11010
140E  DE00 172C              OC    R0,CONRD        OC CONSOLE - READ COMMAND           ELI11020
1412  DB00 1723              RD    R0,SINK         READ A DUMMY CHARACTER (SET BUSY)   ELI11030
1416  4890 1726              LH    R9,PASFLG       PASLA ?                             ELI11040
141A  4200 141A              NOP   *               FOR SPECIAL KB DEVICE               ELI11050
141E  2333         TTYGET    BZS   KBXIT           NO, BRANCH TO EXIT                  ELI11060
1420  DE00 1744              OC    R0,CONRQ2S      YES, OC (REQUEST TO SEND)           ELI11070
1424  0304         KBXIT     BR    R4              RETURN                              ELI11080
                   *----------------------------                                       ELI11090
                   *  TO SET UP KEYBOARD DEV TO READ WITH INT ENABLED                  ELI11100
                   *                                                                   ELI11110
1426  D000 2030    KBRD      STM   R0,RSAVE        SAVE REGISTERS                      ELI11120
142A  D300 172A              LB    R0,CONADR       GET KB DEV ADR                      ELI11130
142E  4810 1726              LH    R1,PASFLG       PASLA ?                             ELI11140
1432  2333                   BZS   KBRD1                                               ELI11150
1434  DE00 1744              OC    R0,CONRQ2S                                          ELI11160
1438  DE00 1739    KBRD1     OC    R0,CONENRD      CONSOLE : ENABLE, READ              ELI11170
143C  D100 2030              LM    R0,RSAVE        RESTORE REGISTERS                   ELI11180
1440  030F                   BR    LINK            RETURN                              ELI11190
                   *----------------------------                                       ELI11200
                   *  LIST DEVICE SET UP ROUTINE                                       ELI11210
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                        1122  *                                                                        ELI11220
1442  4010 176A         1123  SETUP   STA   R1,SET.RTN                                                ELI11230
1446  0310 2021         1124          LB    R1,IOSAVE+1        GET LIST DEVICE IDENTIFIER            ELI11240
144A  9111              1125          SLHLS R1,1               HW INDEX                              ELI11250
144C  0301 0A11         1126          LB    R0,IO+1(R1)        GET LIST DEVICE ADDRESS               ELI11260
1450  0E01 1720         1127          OC    R0,CONWRT(R1)                                            ELI11270
1454  4810 176A         1128          LDA   R1,SET.RTN                                               ELI11280
1458  0301              1129          BR    R1                 RETURN                                ELI11290
                        1130  * ***************************                                          ELI11300
                        1131  *  LOW CORE SET UP ROUTINE                                             ELI11310
                        1132  *                                                                        ELI11320
145A  2410              1133  LCORE   LIS   R1,0                                                     ELI11330
145C  2422              1134          LIS   R2,2                                                     ELI11340
145E  C830 004E         1135          LHI   R3,X'4E'                                                 ELI11350
1462  2400              1136          LIS   R0,0                                                     ELI11360
1464  4001 0000         1137  ZERO1   STH   R0,0(R1)                                                 ELI11370
1468  C110 1464         1138          BXLE  R1,ZERO1           ZERO CORE FROM 0 THRU X'4F'           ELI11380
146C  C810 0080         1139          LHI   R1,X'80'                                                 ELI11390
1470  C830 00CE         1140          LHI   R3,X'CE'                                                 ELI11400
1474  4001 0000         1141  ZERO2   STH   R0,0(R1)                                                 ELI11410
1478  C110 1474         1142          BXLE  R1,ZERO2           ZERO CORE FROM X'80' THRU X'CF'       ELI11420
147C  C800 15AA         1143          LHI   R0,XI32            INTERRUPT HANDLER ROUTINE             ELI11430
1480  C830 08CE         1144          LHI   R3,X'8CE'                                                ELI11440
1484  4001 0000         1145  ZERO3   STH   R0,0(R1)                                                 ELI11450
1488  C110 1484         1146          BXLE  R1,ZERO3           SET UP INT SERVICE POINTER TABLE      ELI11460
148C  C830 16B0         1147          LHI   R3,II                                                    ELI11470
1490  4030 0036         1148          STH   R3,X'36'           ILL INST INT NEW PSW LOC              ELI11480
1494  C840 16CA         1149          LHI   R4,MM                                                    ELI11490
1498  4040 003E         1150          STH   R4,X'3E'           M. M. INT NEW PSW LOC                 ELI11500
149C  C830 167C         1151          LHI   R3,AF                                                    ELI11510
14A0  4030 004E         1152          STH   R3,X'4E'           ARITHMETIC FAULT NEW PSW LOC(32-BIT)  ELI11520
                        1153  *                              FIXED PT DIVIDE FAULT NEW PSW LOC     ELI11530
14A4  C840 2030         1154          LHI   R4,RSAVE                                                 ELI11540
14A8                    1155          IFZ   ADC-2                                                    ELI11550
14A8  4810 1712         1156          LH    R1,MOD32                                                 ELI11560
14AC  4230 14CE         1157          BNZ   LCORE32                                                  ELI11570
                        1158  *                                                                        ELI11580
                        1159  *  SET UP LOW CORE FOR 16 BIT MACHINE                                  ELI11590
                        1160  *                                                                        ELI11600
14B0  4040 0022         1161          STH   R4,X'22'           REG SAVE POINTER                      ELI11610
14B4  C830 166A         1162          LHI   R3,FP                                                    ELI11620
14B8  4030 002E         1163          STH   R3,X'2E'           FLOATING PT FAULT INT NEW PSW LOC     ELI11630
14BC  4850 0A24         1164          LH    R5,PSW2                                                  ELI11640
14C0  4050 0044         1165          STH   R5,X'44'           HW EXT INT NEW PSW STATUS             ELI11650
14C4  C850 159C         1166          LHI   R5,XI16                                                  ELI11660
14C8  4050 0046         1167          STH   R5,X'46'           EXT INT NEW PSW LOC                   ELI11670
14CC  050F              1168          BR    LINK                                                     ELI11680
                        1169          ENDC                                                           ELI11690
                        1170  *                                                                        ELI11700
                        1171  *  SET UP LOW CORE FOR 32 BIT MACHINE                                  ELI11710
                        1172  *                                                                        ELI11720
14CE  4040 0086         1173  LCORE32 STH   R4,X'86'           REG SAVE POINTER                      ELI11730
14D2  C840 2028         1174          LHI   R4,PSWSAVE         PPF PSW SAVE AREA                     ELI11740
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14D6  4040 0084                STH   R4,X'84'          .  POINTER                           ELI11750
14DA  C830 1672                LHI   R3,RP                                                  ELI11760
14DE  4030 0096                STH   R3,X'96'          RELOC/PROTECT INT NEW PSW LOC        ELI11770
14E2  D310 172A                LB    R1,CONADR         LOAD CONSOLE I/O ADDRESS             ELI11780
14E6  0A11                     AAR   R1,R1                                                  ELI11790
14E8  C800 1506                LHI   R0,KBINT0         R0 = A(KEYBOARD INT HANDLER)         ELI11800
14EC  4001 00D0                STH   R0,X'D0'(R1)      STORE @  X'D0'+2(KB DEV ADR)         ELI11810
14F0  2410                     LIS   R1,0              TO SET UP SERVICE POINTER TABLE      ELI11820
14F2  C830 15AA                LHI   R3,XI32                                                ELI11830
14F6  4821 1910      LCORE32A  LH    R2,DEVSADR(R1)    GET DEV ADR FROM TABLE               ELI11840
14FA  021F                     BMR   LINK              DONE. RETURN                         ELI11850
14FC  0A22                     AAR   R2,R2                                                  ELI11860
14FE  4032 00D0                STH   R3,X'D0'(R2)      STORE @  X'D0'+2(DEV ADR)            ELI11870
1502  2612                     AIS   R1,2                                                   ELI11880
1504  2207                     BS    LCORE32A                                               ELI11890
                     *-----------------------------------                                   ELI11900
                     *  KEYBOARD INTERRUPT HANDLER                                          ELI11910
                     *                                                                      ELI11920
1506  C330 0020      KBINT0    THI   R3,X'20'          IS BREAK KEY DEPRESSED ?             ELI11930
150A  4330 1552                BZ    KBINT1            NO                                   ELI11940
150E  D300 0A10                LB    R0,IO                                                  ELI11950
1512  C500 0005                CLHI  R0,5              IS IT MICROBUS ?                     ELI11960
1516  4230 1532                BNE   KBINT0B           NO, BRANCH                           ELI11970
151A  DE20 1736                OC    R2,MREADC         YES, ISSUE READ                      ELI11980
151E  9D23                     SSR   R2,R3                                                  ELI11990
1520  2081                     BTBS  8,1                                                    ELI12000
1522  9B24           KBINT0C   RDR   R2,R4             KNOCK DOWN BREAK                     ELI12010
1524  9D23                     SSR   R2,R3                                                  ELI12020
1526  C330 0020                THI   R3,X'20'          BREAK STILL THERE ?                  ELI12030
152A  4230 1522                BNZ   KBINT0C           YES, KNOCK IT DOWN AGAIN             ELI12040
152E  4300 158A                B     RETOPSW           NO, RETURN ON OLD PSW                ELI12050
1532  4850 1726      KBINT0B   LH    R5,PASFLG         CONSOLE ON PASLA ?                   ELI12060
1536  2339                     BZS   KBINT0A           BRANCH IF NO.                        ELI12070
1538  9B24                     RDR   R2,R4                                                  ELI12080
153A  9D23                     SSR   R2,R3                                                  ELI12090
153C  2281                     BFBS  8,1                                                    ELI12100
153E  0844                     LDAR  R4,R4                                                  ELI12110
1540  4230 158A                BNZ   RETOPSW           IGNORE FRERR ONLY                    ELI12120
1544  4300 1568      KBINT00   B     KBINT3                                                 ELI12130
1548  9D23           KBINT0A   SSR   R2,R3                                                  ELI12140
154A  C330 0020                THI   R3,X'20'                                               ELI12150
154E  2033                     BTBS  3,3               WAIT FOR BREAK RELEASE               ELI12160
1550  2206                     BS    KBINT00           GO TO COMMAND MODE                   ELI12170
1552  C500 0005      KBINT1    CLHI  R0,5              IS IT MICROBUS ?                     ELI12180
1556  4230 1568                BNE   KBINT3            NO, BRANCH                           ELI12190
155A  DE20 1736                OC    R2,MREADC         READ COMMAND TO MICROBUS             ELI12200
155E  9D23                     SSR   R2,R3                                                  ELI12210
1560  2081                     BTBS  8,1                                                    ELI12220
1562  9B24                     RDR   R2,R4             KNOCK DOWN INTERRUPT                 ELI12230
1564  4300 158A                B     RETOPSW           RETURN                               ELI12240
1568  4020 1720      KBINT3    STH   R2,INTDEV                                              ELI12250
156C  D230 1722                STB   R3,INTSTA                                              ELI12260
1570                           IFZ   ADC-2                                                  ELI12270
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1570  4840 1712          1228          LH    R4,MOD32                                    ELI12280
1574  2335               1229          BZS   KBINT2                                     ELI12290
                         1230          ENDC                                            ELI12300
1576  4000 171A          1231          STH   R0,OPSW       STORE OLD PSW OF 32-BIT PROCESSOR ELI12310
157A  4010 171E          1232          STH   R1,OLOC       IN ORDER TO RETURN BACK TO TEST ELI12320
157E  9B24               1233  KBINT2  RDR   R2,R4                                     ELI12330
1580  41F0 131C          1234          BAL   LINK,ECHO     ECHO RECEIVED BYTE          ELI12340
1584  4890 174A          1235          LH    R9,KBINT      IF ZERO,IGNORE: ELSE        ELI12350
1588  0239               1236          BNZR  R9            GO,PROCESS KB INT FURTHER   ELI12360
                         1237  * ------------------------------                        ELI12370
                         1238  *  TO RETURN ON OLD PSW                                 ELI12380
                         1239  *                                                       ELI12390
158A                     1240          IFZ   ADC-2                                     ELI12400
158A  4890 1712          1241  RETOPSW LH    R9,MOD32                                  ELI12410
158E  2135               1242          BNZS  RETOPSW1                                  ELI12420
1590  D100 20B0          1243          LM    R0,INTSAV     RESTORE REGISTERS           ELI12430
1594  C200 0040          1244          LPSW  X'40'         RETURN ON OLD PSW AFTER KB INT ELI12440
1598  C200 1718          1245  RETOPSW1 LPSW OPSW32                                    ELI12450
                         1246          ELSE                                            ELI12460
                         1247  RETOPSW LPSW  OPSW32                                    ELI12470
                         1248          ENDC                                            ELI12480
                         1249  *                                                       ELI12490
                         1250  * ***********************************************       ELI12500
                         1251  *  EXTERNAL INTERRUPT HANDLER                           ELI12510
159C                     1252          IFZ   ADC-2                                     ELI12520
159C  D000 20B0          1253  XI16    STM   R0,INTSAV     FOR 16-BIT PROCESSOR       ELI12530
15A0  9F23               1254          ACKR  R2,R3         ACKNOWLEDGE THE INTERRUPT  ELI12540
15A2  D420 172A          1255          CLB   R2,CONADR     FROM KEYBOARD DEVICE ?     ELI12550
15A6  4330 1506          1256          BE    KBINT0                                    ELI12560
                         1257          ENDC                                            ELI12570
                         1258  *                                                       ELI12580
                         1259  *                         FOR 32-BIT PROCESSOR        ELI12590
15AA  95AA               1260  XI32    EPSR  R10,R10       CAPTURE CURRENT PSW        ELI12600
15AC  40A0 1714          1261          STH   R10,INTPSW                                ELI12610
15B0  4020 1720          1262          STH   R2,INTDEV     STORE INTERRUPTING DEVICE ADDRESS ELI12620
15B4  D230 1722          1263          STB   R3,INTSTA     STORE INTERRUPTING DEVICE STATUS ELI12630
15B8                     1264          IFZ   ADC-2                                     ELI12640
15B8  4850 1712          1265          LH    R5,MOD32                                  ELI12650
15BC  2135               1266          BNZS  XI32A                                     ELI12660
15BE  4800 0040          1267          LH    R0,X'40'      16-BIT OLD PSW              ELI12670
15C2  4810 0042          1268          LH    R1,X'42'                                  ELI12680
                         1269          ENDC                                            ELI12690
15C6  4000 171A          1270  XI32A   STH   R0,OPSW       STORE OLD PSW STATUS       ELI12700
15CA  4010 171E          1271          STH   R1,OLOC       STORE OLD PSW LOC          ELI12710
15CE                     1272          IFZ   ADC-2                                     ELI12720
15CE  0855               1273          LDAR  R5,R5         MOD32 = 0 ?                ELI12730
15D0  233A               1274          BZS   XI16A         BRANCH IF YES.             ELI12740
                         1275          ENDC                                            ELI12750
15D2  4820 0A24          1276          LH    R2,PSW2                                   ELI12760
15D6  9512               1277          EPSR  R1,R2         SELECT USER REGISTER SET   ELI12770
15D8  D000 20B0          1278          STM   R0,INTSAV     SAVE USER REGISTERS        ELI12780
15DC  4820 1720          1279          LH    R2,INTDEV                                 ELI12790
15E0  48A0 1714          1280          LH    R10,INTPSW                                ELI12800
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                      *                                                              ELI12810
15E4   2450           XI16A   LIS    R5,0                                            ELI12820
15E6   4865 1910      XI1     LH     R6,DEVSADR(R5)    GET DEV ADRS FROM TABLE       ELI12830
15EA   4210 1636              BM     XIERR             TABLE OVERFLOW.               ELI12840
15EE   0562                   CLAR   R6,R2             COMPARE INTERRUPTING DEVICE ADDRESS ELI12850
15F0   2333                   BES    XI2                                             ELI12860
15F2   2652                   AIS    R5,2                                            ELI12870
15F4   2207                   BS     XI1                                             ELI12880
15F6   4865 192A      XI2     LH     R6,DEVINT(R5)     GET INTERRUPT HANDLER ADDRESS ELI12890
15FA   4330 1636              BZ     XIERR             INTERRUPT NOT EXPECTED        ELI12900
15FE   4060 1634              STH    R6,XIEXIT                                       ELI12910
                      *                                                              ELI12920
1602                          IFZ    ADC-2                                           ELI12930
1602   4860 1712              LH     R6,MOD32          32-BIT MACHINE ?              ELI12940
1606   2339                   BZS    XI3               BRANCH IF NO.                 ELI12950
                              ENDC                                                   ELI12960
1608   9051                   SRLS   R5,1                                            ELI12970
160A   90A4                   SRLS   R10,4                                           ELI12980
160C   C4A0 000F              NHI    R10,15                                          ELI12990
1610   D4A5 1922              CLB    R10,INTLVL(R5)    CHECK PROPER INTERRUPT LEVEL  ELI13000
1614   4230 1646              BNE    LVLERR                                          ELI13010
                      *                                                              ELI13020
1618   4860 171E      XI3     LH     R6,OLOC           GET PSW AT TIME OF INTERRUPT  ELI13030
161C   C560 1114              CLHI   R6,$TIMER1                                      ELI13040
1620   2187                   BLS    XI4               WAS INTERRUPT IN TIMER ROUTINE ? ELI13050
1622   C560 1128              CLHI   R6,$TIMXT                                       ELI13060
1626   2384                   BNLS   XI4               BRANCH IF NO.                 ELI13070
1628   D100 2030              LM     R0,RSAVE          RESTORE FROM 'TIMER' ENTRY    ELI13080
162C   2303                   BS     XI5                                             ELI13090
162E   D100 2080      XI4     LM     R0,INTSAV         RESTORE FROM XI16/XI32 ENTRY  ELI13100
1632   4300 1632      XI5     B      *                 AND GO TO INTERRUPT HANDLER   ELI13110
       0000 1634      XIEXIT  EQU    *-2               NOTE:  16 KB RESTRICTION !    ELI13120
                      *----------------------------------                            ELI13130
                      *  EXTERNAL INTERRUPT ERROR ROUTINE                            ELI13140
                      *                                                              ELI13150
1636   C860 4634      XIERR   LHI    R6,C'F4'          ERROR # F4                    ELI13160
163A   4060 179A              STH    R6,ERRNO                                        ELI13170
163E   41F0 0FDE              BAL    LINK,ERRALL       'ERROR XXF4', 'DEV DDD STA SS' ELI13180
                      *                                'PSW PPPP  LOC LLLL'          ELI13190
1642   4300 0AFA              B      OPTIN1            TO ENTER COMMAND MODE         ELI13200
                      *----------------------------------                            ELI13210
                      * DEVICE INTERRUPTED IN WRONG INTERRUPT LEVEL                  ELI13220
                      *                                                              ELI13230
1646   C860 4636      LVLERR  LHI    R6,C'F6'          ERROR # F6                    ELI13240
164A   4060 179A              STH    R6,ERRNO                                        ELI13250
164E   D3AA 1778              LB     R10,HEXTAB(R10)   CONVERT TO ASCII              ELI13260
1652   D2A0 17FB              STB    R10,ERRLVL        AND STORE ERROR LEVEL IN MESSAGE ELI13270
1656   41F0 0FDE              BAL    LINK,ERRALL       'ERROR XXF6', 'DEV DDD STA SS' ELI13280
                      *                                'PSW PPPP  LOC LLLL'          ELI13290
165A   C850 17E6              LHI    R5,INTLVLM                                      ELI13300
165E   4050 174E              STH    R5,ISITERR        SET FLAG TO OVERRIDE NOMSG OPTION ELI13310
1662   41F0 11F0              BAL    LINK,PRINT        'INTERRUPTED IN LEVEL  N'     ELI13320
1666   4300 0AFA              B      OPTIN1            ENTER COMMAND MODE.           ELI13330
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                  *---------------------------                                    ELI13340
                  *  SPURIOUS INTERRUPT HANDLERS                                  ELI13350
                  *                                                               ELI13360
                  *                                                               ELI13370
166A                        IFZ   ADC-2                                           ELI13380
                  *  FLOATING-PT ARITH FAULT INT TRAP  (16 BIT PROCESSOR)         ELI13390
                  *                                                               ELI13400
166A   48E0 0028  FP        LH    R14,X'28'          OLD PSW (16-BIT PROCESSOR)   ELI13410
166E   48F0 002A            LH    R15,X'2A'          OLD LOC                      ELI13420
                            ENDC                                                  ELI13430
                  *                                                               ELI13440
                  *  RELOCATION/PROTECTION INT TRAP                               ELI13450
                  *                                                               ELI13460
1672   C820 4635  RP        LHI   R2,C'F5'                                        ELI13470
1676   4020 179A            STH   R2,ERRNO           SET ERROR # F5               ELI13480
167A   230C                 BS    COMM                                            ELI13490
                  *                                                               ELI13500
                  *  ARITHMETIC FAULT INT (32-BIT PROCESSOR) TRAP                 ELI13510
167C                        IFZ   ADC-2                                           ELI13520
                  *  FIXED-PT DIVIDE FAULT INT (16-BIT PROCESSOR) TRAP            ELI13530
                            ENDC                                                  ELI13540
                  *                                                               ELI13550
167C   C820 4631  AF        LHI   R2,C'F1'                                        ELI13560
1680   4020 179A            STH   R2,ERRNO           SET ERROR # F1               ELI13570
1684                        IFZ   ADC-2                                           ELI13580
1684   4820 1712            LH    R2,MOD32                                        ELI13590
1688   2135                 BNZS  COMM                                            ELI13600
168A   48E0 0048            LH    R14,X'48'          OLD PSW (16-BIT PROCESSOR)   ELI13610
168E   48F0 004A            LH    R15,X'4A'          OLD LOC (16-BIT PROCESSOR)   ELI13620
                            ENDC                                                  ELI13630
1692   40E0 171A  COMM      STH   R14,OPSW                                        ELI13640
1696   40F0 171E            STH   R15,OLOC                                        ELI13650
169A   4800 0A24  COMM1     LH    R0,PSW2                                         ELI13660
169E   9520                 EPSR  R2,R0              NO INT. , REG SET 15         ELI13670
16A0   41F0 0F6C            BAL   LINK,ERR           PRINT 'ERROR XXFN'           ELI13680
16A4   40F0 174E            STH   LINK,ISITERR       FORCE PRINT                  ELI13690
16A8   41E0 10A2            BAL   RET,ERRPL1         PRINT 'PSW PPPP  LOC LLLL'   ELI13700
16AC   4300 0AFA            B     OPTIN1             ENTER COMMAND MODE           ELI13710
                  *                                                               ELI13720
                  *  ILLEGAL INSTRUCTION INTERRUPT TRAP                           ELI13730
                  *                                                               ELI13740
16B0   C820 4632  II        LHI   R2,C'F2'                                        ELI13750
16B4   4020 179A            STH   R2,ERRNO           SET ERROR # F2               ELI13760
16B8                        IFZ   ADC-2                                           ELI13770
16B8   4820 1712            LH    R2,MOD32                                        ELI13780
16BC   2135                 BNZS  II32                                            ELI13790
16BE   48E0 0030            LH    R14,X'30'          OLD PSW                      ELI13800
16C2   48F0 0032            LH    R15,X'32'          OLD LOC                      ELI13810
                            ENDC                                                  ELI13820
16C6   4300 1692  II32      B     COMM                                            ELI13830
                  *                                                               ELI13840
                  *  MACHINE MALFUNCTION INTERRUPT TRAP                           ELI13850
                  *                                                               ELI13860
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16CA   95AA             1387  MM        EPSR  R10,R10             CAPTURE MMINT PSW                ELI13870
16CC   C820 4633        1388            LHI   R2,C'F3'                                             ELI13880
16D0   4020 179A        1389            STH   R2,ERRNO            SET ERROR # F3                   ELI13890
16D4   48E0 0022        1390            LH    R14,X'22'           OLD PSW ( 32-BIT PROCESSOR)      ELI13900
16D8   48F0 0026        1391            LH    R15,X'26'           OLD LOC                          ELI13910
16DC                    1392            IFZ   ADC-2                                                ELI13920
16DC   4820 1712        1393            LH    R2,MOD32                                             ELI13930
16E0   2135             1394            BNZS  MM32                                                 ELI13940
16E2   48E0 0038        1395            LH    R14,X'38'           OLD PSW (16 BIT PROCESSOR)       ELI13950
16E6   48F0 003A        1396            LH    R15,X'3A'           OLD LOC                          ELI13960
                        1397            ENDC                                                       ELI13970
16EA   C4E0 FFF0        1398  MM32      NHI   R14,X'FFF0'                                          ELI13980
16EE   C4A0 000F        1399            NHI   R10,X'000F'                                          ELI13990
16F2   06EA             1400            OAR   R14,R10                                              ELI14000
16F4   40E0 171A        1401            STH   R14,OPSW                                             ELI14010
16F8   40F0 171E        1402            STH   R15,OLOC                                             ELI14020
16FC                    1403            IFZ   ADC-2                                                ELI14030
16FC   C810 7FFF        1404            LHI   R1,X'7FFF'                                           ELI14040
1700   2711             1405  MM16      SIS   R1,1                                                 ELI14050
1702   2021             1406            BPS   MM16                                                 ELI14060
                        1407            ENDC                                                       ELI14070
1704   C800 080F        1408            LHI   R0,X'080F'                                           ELI14080
1708   9104             1409            SLHLS R0,4                R0 = X'80F0'                     ELI14090
170A   9520             1410            EPSR  R2,R0               HALT PROCESSOR                   ELI14100
                        1411  *                                                                    ELI14110
                        1412  *   WHEN EXE/RUN IS DEPRESSED, ERROR MSG IS PRINTED.                 ELI14120
                        1413  *                                                                    ELI14130
170C   4300 169A        1414            B     COMM1                                                ELI14140
                        1415  * ***************************                                        ELI14150
                        1416  *  ETPE CONSTANTS & TABLES                                           ELI14160
                        1417  *                                                                    ELI14170
1710   0000             1418  FIRST     DCX   0                                                    ELI14180
1712   0000             1419  MOD32     DCX   0                   FLAG FOR 32-BIT M/C(NON-ZERO)    ELI14190
1714   0000             1420  INTPSW    DCX   0                   (FOR 32-BIT M/C ONLY)            ELI14200
1718                    1421            ALIGN 8                                                    ELI14210
                        1422  *-----------------------                                           ELI14220
1718   0000             1423  OPSW32    DCX   0                   OLD PSW STORAGE AREA             ELI14230
171A   0000             1424  OPSW      DCX   0                                                    ELI14240
171C   0000             1425            DCX   0                                                    ELI14250
171E   0000             1426  OLOC      DCX   0                                                    ELI14260
                        1427  *-----------------------                                           ELI14270
1720   0000             1428  INTDEV    DCX   0                   INTERRUPTING DEV ADR             ELI14280
       0000 1720        1429  ERRDEV    EQU   INTDEV              ERROR DEVICE #                   ELI14290
1722   00               1430  INTSTA    DB    0                   INTERRUPTING DEV STATUS          ELI14300
       0000 1722        1431  ERRSTA    EQU   INTSTA              ERRONEOUS STATUS                 ELI14310
1723   00               1432  SINK      DB    0                   BIT BUCKET                       ELI14320
1724   80               1433  NORM      DB    X'80'                                                ELI14330
1725   40               1434  INCR      DB    X'40'                                                ELI14340
1726                    1435            DB    *                   (ALIGN ON HW BOUNDRY)            ELI14350
1726   0000             1436  PASFLG    DCX   0                   SET WHEN CONSOLE ON PASLA/PALM   ELI14360
1728   0000             1437  PASFLG2   DCX   0                   SET WHEN LIST DEVICE ON PASLA    ELI14370
                        1438  * --------------------                                            ELI14380
                        1439  *  ETPE IO COMMANDS                                                ELI14390
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                              1440  *                                                             ELI14400
 172A   0000                  1441  CONADR    DCX   0                  CONSOLE DEVICE ADDRESS     ELI14410
                              1442  *                                                             ELI14420
 172C   0000                  1443  CONRD     DCX   0                  CONSOLE READ/WRITE COMMANDS ELI14430
        0000 172D             1444  CONWRT    EQU   CONRD+1                                       ELI14440
 172E   B9AB                  1445  CRTRD     DCX   B9AB               FOR CRT                    ELI14450
 1730   A4D8                  1446  CLIFRD    DCX   A4D8               *   CURRENT LOOP INTERFACE ELI14460
 1732   0080                  1447  LPWRT     DCX   0080               *   LINE PRINTER           ELI14470
 1734   A9AB                  1448  CARRD     DCX   A9AB               *   CAROUSEL 300           ELI14480
 1736   8202                  1449  MREADC    DCX   8202               *   MICROBUS               ELI14490
                              1450  *                                                             ELI14500
 1738   0000                  1451  CON2ND    DCX   0                  2ND COMMAND: ENABLE READ COMMAND ELI14510
        0000 1739             1452  CONENRD   EQU   CON2ND+1                                      ELI14520
 173A   F879                  1453  CRT2ND    DCX   F879               FOR CRT                    ELI14530
 173C   0064                  1454  CLIF2ND   DCX   0064               *   CURRENT LOOP INTERFACE ELI14540
 173E   0000                  1455            DCX   0                  *   DUMMY HW FOR LP        ELI14550
 1740   F069                  1456  CAR2ND    DCX   F069               *   CAROUSEL 300           ELI14560
 1742   0000                  1457            DCX   0                  *   DUMMY HW FOR MICROBUS  ELI14570
                              1458  *                                                             ELI14580
 1744   00                    1459  CONRQ2S   DB    0                  CONSOLE REQUEST TO SEND CMD ELI14590
 1745   3B                    1460  CRTRQ2S   DB    X'3B'              FOR CRT                    ELI14600
 1746   00                    1461            DB    0                  *   DUMMY BYTE FOR CLI     ELI14610
 1747   00                    1462            DB    0                  *   DUMMY BYTE FOR LP      ELI14620
 1748   23                    1463  CARRQ2S   DB    X'23'              *   CAROUSEL 300           ELI14630
 1749   00                    1464            DB    0                  *   DUMMY BYTE FOR MICROBUS ELI14640
 174A                         1465            DB    *                  (ALIGN ON HW BOUNDRY)      ELI14650
                              1466  * --------------------                                        ELI14660
 174A   158A                  1467  KBINT     DC    Z(RETOPSW)         KEYBOARD INT RETURN ADR    ELI14670
 174C   0000                  1468  BRKVECT   DC    Z(0)               BREAK KEY VECTOR           ELI14680
 174E   0000                  1469  ISITERR   DCX   0                                             ELI14690
 1750   0000                  1470  NOERR     DCX   0                                             ELI14700
 1752   0000                  1471  SELTST    DCX   0                  HIGHEST SELECTED TEST #    ELI14710
 1754   0000                  1472  WASDU     DCX   0                  1 IF KEYBOARD DEVICE WAS OFF ELI14720
 1756   0000                  1473  WASDU1    DCX   0                  NON-ZERO IF TOTAL,TOTERR TO PRINT ELI14730
 1758   0000                  1474  TOTAL     DCX   0                  # OF TIMES THE SELECTED TESTS RUN ELI14740
 175A   0000                  1475  TOTERR    DCX   0                  TOTAL ERRORS DETECTED WHILE DU ELI14750
 175C   0000                  1476  BTESTNO   DCX   0                  CURRENT TEST # IN BINARY   ELI14760
 175E   0000                  1477  COUNT     DCX   0                                             ELI14770
 1760   0000                  1478  NEXTST    DCX   0                  NEXT TEST #                ELI14780
 1762   0000                  1479  $NULL     DCX   0                  NULL HW FOR DISPLAY USE    ELI14790
 1764   0000                  1480  PAUSE     DCX   0                  SET DURING TRANSMISSION PAUSE (C300) ELI14800
 1766   0000                  1481  OUT.SAV   DAC   0                  OUTCHR RETURN ADDRESS SAVE ELI14810
 1768   0000                  1482  BRK.SAV   DAC   0                  TSTBRK RETURN ADDRESS SAVE ELI14820
 176A   0000                  1483  SET.RTN   DAC   0                  SETUP RETURN ADDRESS SAVE  ELI14830
 176C   0000                  1484  COMRET    DAC   0                  ERRCOM RETURN ADDRESS SAVE ELI14840
                              1485  *                                                             ELI14850
 176E   0001                  1486  DECTAB    DC    1,10,100,1000,10000                           ELI14860
 1770   000A
 1772   0064
 1774   03E8
 1776   2710
 1778   3031 3233 3435 3637   1487  HEXTAB    DB    C'0123456789ABCDEF'                           ELI14870
 1780   3839 4142 4344 4546
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                                1488  *--------------------------------                                    ELI14880
                                1489  *  ETPE MESSAGES                                                    ELI14890
                                1490  *                                                                   ELI14900
1788  5445 5354 2020 2A2A       1491  TSTMSG   DC    C'TEST  **',X'0D00'                                   ELI14910
1790  0D00
      0000 178E                 1492  MTESTNO  EQU   TSTMSG+6                                            ELI14920
1792  4552 524F 5220 2A2A       1493  ERRMSG   DC    C'ERROR ****',X'0D00'                                ELI14930
179A  2A2A
179C  0D00
      0000 1798                 1494  ETESTNO  EQU   ERRMSG+6            STORED BY ETPE                  ELI14940
      0000 179A                 1495  ERRNO    EQU   ERRMSG+8            STORE ERRNO AS CHAR CONSTANT    ELI14950
179E  544F 5441 4C20 2020       1496  TOTMSG   DC    C'TOTAL   TOTERR',X'0D00'                            ELI14960
17A6  544F 5445 5252
17AC  0D00
17AE  4E4F 2045 5252 4F52       1497  NOERMSG  DC    C'NO ERROR',X'0D00'                                  ELI14970
17B6  0D00
17B8  4445 5620 2A2A 2A20       1498  DEVMSG   DC    C'DEV *** STA **',X'0D00'                            ELI14980
17C0  5354 4120 2A2A
17C6  0D00
      0000 17BC                 1499  ASCIDEV  EQU   DEVMSG+4                                            ELI14990
      0000 17C0                 1500  STAMSG   EQU   DEVMSG+8                                            ELI15000
      0000 17C4                 1501  ASCISTA  EQU   DEVMSG+12                                           ELI15010
17C9  4445 5620 2A2A 2A20       1502  DEVMSG2  DC    C'DEV ***',X'0D00'                                   ELI15020
17D0  0D00
      0000 17CC                 1503  ASCIDEV2 EQU   DEVMSG2+4                                           ELI15030
17D2  5053 5720 2A2A 2A2A       1504  PSWMSG   DC    C'PSW ****  LOC ****',X'0D00'                       ELI15040
17DA  2020 4C4F 4320 2A2A
17E2  2A2A
17E4  0D00
      0000 17D6                 1505  ASCIPSW  EQU   PSWMSG+4                                            ELI15050
      0000 17DC                 1506  LOCMSG   EQU   PSWMSG+10                                           ELI15060
      0000 17E0                 1507  ASCILOC  EQU   PSWMSG+14                                           ELI15070
17E6  494E 5445 5252 5550       1508  INTLVLM  DC    C'INTERRUPTED IN LEVEL *',X'0D00'                    ELI15080
17EE  5445 4420 494E 204C
17F6  4556 454C 202A
17FC  0D00
      0000 17FB                 1509  ERRLVL   EQU   INTLVLM+21                                          ELI15090
17FE  454E 4420 4F46 2054       1510  EOTMSG   DC    C'END OF TEST',X'0D00'                               ELI15100
1806  4553 5420
180A  0D00
180C  3F0D                      1511  QMSG     DC    X'3F0D'                                             ELI15110
180E  2A0D                      1512  AMSG     DC    X'2A0D'                                             ELI15120
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                                1515  *-----------------------------                               ELI15150
                                1516  *  OPTION/COMMAND TABLE                                      ELI15160
                                1517  *                                                            ELI15170
       0000 1810                1518  OPT      EQU    *                                            ELI15180
1810   5445 5354 2020           1519  TEST     DC     C'TEST  ',X'F800',X'0000',X'0000'            ELI15190
1816   F800
1818   0000
181A   0000
181C   4C4F 4F50 2020           1520  LOOP     DC     C'LOOP  ',X'0000',X'0000',X'0000'            ELI15200
1822   0000
1824   0000
1826   0000
1828   434F 4E54 494E           1521  CONTIN   DC     C'CONTIN',X'0000',Z(ZERONE),X'0000'          ELI15210
182E   0000
1830   0CDA
1832   0000
1834   4E4F 4D53 4720           1522  NOMSG    DC     C'NOMSG ',X'0000',Z(ZERONE),X'0000'          ELI15220
183A   0000
183C   0CDA
183E   0000
1840   494E 544C 4556           1523  INTLEV   DC     C'INTLEV',X'0000',Z(LEVEL),X'0000'           ELI15230
1846   0000
1848   0CEA
184A   0000
184C   5449 4D56 414C           1524  TIMVAL   DC     C'TIMVAL',X'00DA',X'0000',X'0000'            ELI15240
1852   00DA
1854   0000
1856   0000
1858   4445 5641 4452           1525  DEVADR   DC     C'DEVADR',X'0020',X'0000',X'0000'            ELI15250
185E   0020
1860   0000
1862   0000
                                1526  *                                                            ELI15260
                                1527  * ************************************************************* ELI15270
                                1528  *                                                            ELI15280
       0000 1864                1529  OPTEND2  EQU    *                                            ELI15290
                                1530  *                                                            ELI15300
1864   4F50 5449 4F4E           1531  OPTION   DC     C'OPTION',X'0000',X'0000',X'0000' ETE1       ELI15310
186A   0000
186C   0000
186E   0000
1870   5255 4E20 2020           1532  RUN      DC     C'RUN   ',X'0000',X'0000',X'0000'            ELI15320
1876   0000
1878   0000
187A   0000
187C   FFFF                     1533           DC     -1                   END OF OPTION TABLE     ELI15330
                                1534  ************************************************************ ELI15340
                                1535  *                                                            ELI15350
187E   F800                     1536  DEFTESTS DC     X'F800',X'0000'      DEFAULT 0,1,2,3,4       ELI15360
1880   0000
1882   0005                     1537  MAXTST   DCX    5                    HIGHEST TEST NUMBER     ELI15370
                                1538  *                                                            ELI15380
       0000 1884                1539  TESTS    EQU    *                                            ELI15390
1884   193A                     1540           DC     TEST0                                        ELI15400
1886   19AA                     1541           DC     TEST1                                        ELI15410
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1888  1A26                1542          DC    TEST2                                                    ELI15420
188A  1AD4                1543          DC    TEST3                                                    ELI15430
188C  1896                1544          DC    TEST4                                                    ELI15440
188E  1C84                1545          DC    TEST5                                                    ELI15450
                          1546  *                                                                      ELI15460
1890  434F 4D4D 4F4E 2045 1547  TITLE     DC    C'COMMON EIGHT-LINE INTERRUPT MODULE TEST 06-134R04'     ELI15470
1898  4947 4854 204C 494E
18A0  4520 494E 5445 5252
18A8  5550 5420 4D4F 4455
18B0  4C45 2054 4553 5420
18B8  3036 2D31 3334 5230
18C0  3420
18C2  0D0A                1548          DCX   D0A                                                      ELI15480
18C4  4745 4E45 5241 5445 1549  MESSAGE   DC    C'GENERATE INTERRUPT',X'D0A'                             ELI15490
18CC  2049 4E54 4552 5255
18D4  5054
18D6  0D0A
18D8  434D 4420 4144 5220 1550  CMDMSG    DC    C'CMD ADR '                                              ELI15500
18E0  2A2A 2A20           1551  ASCADR    DC    C'*** ',X'D0A'                                           ELI15510
18E4  0D0A
18E6  4558 5020           1552  ASCMSG    DC    C'EXP '                                                  ELI15520
18EA  2A2A 2A20           1553  ASCEXP    DC    C'*** ',X'D0A'                                           ELI15530
18EE  0D0A
18F0  5245 5345 5420      1554  RSTMSG    DC    C'RESET '                                                ELI15540
18F6  2A2A 2A20           1555  ASCRST    DC    C'*** ',X'D0A'                                           ELI15550
18FA  0D0A
18FC  4E4F 204D 4F52 4520 1556  QUEMSG    DC    C'NO MORE INTERRUPTS',X'D0A'                             ELI15560
1904  494E 5445 5252 5550
190C  5453
190E  0D0A
                          1557  *  ************************************************************          ELI15570
                          1558  *                                                                      ELI15580
      0000 1910           1559  DEVSADR   EQU   *                   INTERRUPTING DEVICE TABLE          ELI15590
1910  0000                1560  LINE0     DCX   0                                                      ELI15600
1912  0000                1561  LINE1     DCX   0                                                      ELI15610
1914  0000                1562  LINE2     DCX   0                                                      ELI15620
1916  0000                1563  LINE3     DCX   0                                                      ELI15630
1918  0000                1564  LINE4     DCX   0                                                      ELI15640
191A  0000                1565  LINE5     DCX   0                                                      ELI15650
191C  0000                1566  LINE6     DCX   0                                                      ELI15660
191E  0000                1567  LINE7     DCX   0                                                      ELI15670
1920  FFFF                1568            DCX   FFFF                                                   ELI15680
                          1569  *                                                                      ELI15690
1922                      1570  INTLVL    DO    8                   EXPECTED INTERRUPT LEVELS FOR ABOVE ELI15700
1922  00                  1571            DB    0                                                      ELI15710
1923  00                  1571            DB    0
1924  00                  1571            DB    0
1925  00                  1571            DB    0
1926  00                  1571            DB    0
1927  00                  1571            DB    0
1928  00                  1571            DB    0
1929  00                  1571            DB    0
                          1572  *                                                                      ELI15720
      0000 192A           1573  DEVINT    EQU   *                   INTERRUPT HANDLER VECTORS          ELI15730
192A  0000                1574  HDLR0     DCX   0                   FOR LINE 0                         ELI15740
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192C   0000                 HDLR1    DCX   0                                                        ELI15750
192E   0000                 HDLR2    DCX   0                                                        ELI15760
1930   0000                 HDLR3    DCX   0                                                        ELI15770
1932   0000                 HDLR4    DCX   0                                                        ELI15780
1934   0000                 HDLR5    DCX   0                                                        ELI15790
1936   0000                 HDLR6    DCX   0                                                        ELI15800
1938   0000                 HDLR7    DCX   0                  FOR LINE 7                            ELI15810
                            *                                                                       ELI15820
                            *                                                                       ELI15830
                            *  ***************************************************************     ELI15840
                            *                                                                       ELI15850
                            *                                                                       ELI15860
                            * PURPOSE OF TEST:                                                      ELI15870
                            * TEST 0 VERIFIES THAT A 'CLEAR' COMMAND (X'08') DOES CLEAR ALL         ELI15880
                            * PENDING INTERRUPTS WITHIN THE EIGHT-LINE INTERRUPT MODULE.            ELI15890
                            *                                                                       ELI15900
                            * ASSUMPTIONS:                                                          ELI15910
                            * IT IS ASSUMED THAT THE PROCESSOR, MEMORY, AND TELETYPE TESTS HAVE     ELI15920
                            * BEEN RUN PRIOR TO SELECTING THIS TEST.                                ELI15930
                            *                                                                       ELI15940
                            * DESIGN SPECIFICATIONS:                                                ELI15950
                            * DEVICE INTERRUPTS ARE ENABLED, AND ALL LINES ARE SET. A 'CLEAR'       ELI15960
                            * COMMAND IS ISSUED, AND ALL LINES ARE MASKED. PROCESSOR INTERRUPTS     ELI15970
                            * ARE ENABLED. NO INTERRUPT SHOULD OCCUR. AFTER A FIXED DELAY,          ELI15980
                            * PROCESSOR INTERRUPTS ARE DISABLED, AND THE TEST TERMINATES.           ELI15990
                            *                                                                       ELI16000
                            * THE TEST IS REPEATED EIGHT TIMES, EACH TIME USING THE ADDRESS OF      ELI16010
                            * THE NEXT SEQUENTIAL INTERRUPT LINE AS THE DEVICE ADDRESS TO WHICH     ELI16020
                            * ALL COMMANDS ARE SENT.  IF FALSE SYNC RESULTS FROM AN OUTPUT          ELI16030
                            *  COMMAND FOR ANY ADDRESS, AN ERROR MESSAGE IS PRINTED,                ELI16040
                            * AND THE TEST ABORTED.                                                 ELI16050
                            *                                                                       ELI16060
                            *                                                                       ELI16070
                            * HOW TO RUN THE TEST:                                                  ELI16080
                            * ENTER APPROPRIATE VALUES FOR THE TIMVAL AND DEVADR OPTIONS, SELECT    ELI16090
                            * THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.        ELI16100
                            *                                                                       ELI16110
                            * OPTIONS:                                                              ELI16120
                            * TEST, DEVADR, INTLEV, CONTIN, LOOP, TIMVAL.                           ELI16130
                            *                                                                       ELI16140
                            * ERRORS:                                                               ELI16150
                            * 01 09                                                                 ELI16160
                            *                                                                       ELI16170
                            *                                                                       ELI16180
       0000 193A            TEST0    EQU   *                                                        ELI16190
                            *                                                                       ELI16200
193A   C810 192A                     LHI   R1,DEVINT                                                ELI16210
193E   C800 1990                     LHI   R0,T0INT           UNEXPECTED INTPT HDLR.                ELI16220
1942   0821                          LHR   R2,R1                                                    ELI16230
1944   4002 0000            TST0.0   STH   R0,0(R2)                                                 ELI16240
1948   2622                          AIS   R2,2                                                     ELI16250
194A   C521 0010                     CLHI  R2,16(R1)                                                ELI16260
194E   2085                          BLS   TST0.0                                                   ELI16270
                            *                                                                       ELI16280
1950   4820 1910                     LH    R2,DEVSADR         LINE 0 ADDRESS                        ELI16290
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1954  4020 2010          1630  TST0.1   STH   R2,CMDADR          ADDRESS TO WHICH COMMAND SENT          ELI16300
1958  DE20 2015          1631           OC    R2,ENST            (ENAB INTPTS, SET MODE)                ELI16310
195C  4240 1EFA          1632           BTC   4,TT09X            FALSE SYNC.                            ELI16320
1960  DA20 2014          1633           WD    R2,ALLI            SET ALL LINES,                         ELI16330
1964  DE20 2016          1634           OC    R2,CLRI            THEN SEND 'CLEAR' COMMAND              ELI16340
1968  DE20 2013          1635           OC    R2,ENMK            (ENAB INTPTS, LOAD MASK MODE)          ELI16350
196C  DA20 2014          1636           WD    R2,ALLI            MASK ALL LINES                         ELI16360
1970  2400               1637           LIS   R0,0                                                      ELI16370
1972  4000 200A          1638           STH   R0,INTCNT          INIT COUNT                             ELI16380
                         1639  *                                                                        ELI16390
1976  41F0 1F58          1640  TST0.2   BAL   LINK,DELAY         NO INTERRUPT SHOULD OCCUR.             ELI16400
                         1641  *                                                                        ELI16410
197A  4810 1910          1642           LH    R1,DEVSADR                                               ELI16420
197E  4820 2010          1643           LH    R2,CMDADR                                                ELI16430
1982  2621               1644           AIS   R2,1               DEVICE ADDRESS                         ELI16440
1984  C521 0008          1645           CLHI  R2,8(R1)                                                 ELI16450
1988  4280 1954          1646           BL    TST0.1             REPEAT FOR ALL LINE ADDRESSES.         ELI16460
                         1647  *                                                                        ELI16470
198C  4300 0E5E          1648  T0END    B     TSTEND             RETURN TO EXECUTIVE.                   ELI16480
                         1649  *                                                                        ELI16490
1990  41F0 1D94          1650  T0INT    BAL   R15,TT01                                                 ELI16500
1994  4800 200A          1651           LH    R0,INTCNT                                                ELI16510
1998  2601               1652           AIS   R0,1                                                     ELI16520
199A  4000 200A          1653           STH   R0,INTCNT                                                ELI16530
199E  C500 0008          1654           CLHI  R0,8               ALLOW UP TO 8                          ELI16540
19A2  4280 1976          1655           BL    TST0.2                                                   ELI16550
19A6  4300 198C          1656           B     T0END                                                    ELI16560
                         1657  *                                                                        ELI16570
                         1658  *                                                                        ELI16580
                         1659  *  ************************************************************          ELI16590
                         1660  *                                                                        ELI16600
                         1661  * PURPOSE OF TEST:                                                       ELI16610
                         1662  * TEST 1 VERIFIES THAT ALL DEVICE INTERRUPTS ARE DISABLED WHEN A         ELI16620
                         1663  * 'DISABLE' COMMAND IS ISSUED; THE ABILITY OF THE MASK TO PREVENT        ELI16630
                         1664  * INTERRUPTS IS ALSO TESTED.                                            ELI16640
                         1665  *                                                                        ELI16650
                         1666  * ASSUMPTIONS:                                                          ELI16660
                         1667  * IT IS ASSUMED THAT THE PROCESSOR, MEMORY, AND TELETYPE TESTS HAVE      ELI16670
                         1668  * BEEN RUN PRIOR TO SELECTING THIS TEST.                                 ELI16680
                         1669  *                                                                        ELI16690
                         1670  * DESIGN SPECIFICATIONS:                                                ELI16700
                         1671  * DEVICE INTERRUPTS ARE ENABLED AND ALL LINES ARE SET, A 'DISABLE'       ELI16710
                         1672  * COMMAND IS ISSUED, AND ALL LINES ARE MASKED. PROCESSOR INTERRUPTS      ELI16720
                         1673  * ARE ENABLED. NO INTERRUPT SHOULD OCCUR.                               ELI16730
                         1674  *                                                                        ELI16740
                         1675  * AFTER A FIXED DELAY, PROCESSOR INTERRUPTS ARE DISABLED, DEVICE        ELI16750
                         1676  * INTERRUPTS ARE ENABLED, AND ALL LINES ARE UNMASKED (ALL LINES ARE      ELI16760
                         1677  * SET). PROCESSOR INTERRUPTS ARE ENABLED. NO INTERRUPT SHOULD OCCUR.     ELI16770
                         1678  * AFTER A FIXED DELAY, PROCESSOR INTERRUPTS ARE DISABLED, AND THE       ELI16780
                         1679  * TEST TERMINATES.                                                      ELI16790
                         1680  *                                                                        ELI16800
                         1681  * THE TEST IS REPEATED EIGHT TIMES, EACH TIME USING THE ADDRESS OF      ELI16810
                         1682  * THE NEXT SEQUENTIAL INTERRUPT LINE AS THE DEVICE ADDRESS TO WHICH      ELI16820
                         1683  * ALL COMMANDS ARE SENT.                                                ELI16830
                         1684  *                                                                        ELI16840
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                                1685  * HOW TO RUN THE TEST:                                                    ELI16850
                                1686  * ENTER APPROPRIATE VALUES FOR THE TIMVAL AND DEVADR OPTIONS, SELECT      ELI16860
                                1687  * THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.         ELI16870
                                1688  *                                                                        ELI16880
                                1689  * OPTIONS:                                                               ELI16890
                                1690  * TEST, DEVADR, INTLEV, CONTIN, LOOP, TIMVAL.                            ELI16900
                                1691  *                                                                        ELI16910
                                1692  * ERRORS:                                                                ELI16920
                                1693  * 02                                                                     ELI16930
                                1694  *                                                                        ELI16940
          0000 19AA             1695  TEST1    EQU   *                                                         ELI16950
                                1696  *                                                                        ELI16960
19AA      C810 192A             1697           LHI   R1,DEVINT                                                 ELI16970
19AE      C800 1A0C             1698           LHI   R0,T1INT          UNEXPECTED INTPT HDLR                   ELI16980
19B2      0821                  1699           LHR   R2,R1                                                     ELI16990
19B4      4002 0000             1700  TST1.0   STH   R0,0(R2)                                                  ELI17000
19B8      2622                  1701           AIS   R2,2                                                      ELI17010
19BA      C521 0010             1702           CLHI  R2,16(R1)                                                 ELI17020
19BE      2085                  1703           BLS   TST1.0                                                    ELI17030
                                1704  *                                                                        ELI17040
19C0      4820 1910             1705           LH    R2,DEVSADR        LINE 0 ADDRESS                        ELI17050
19C4      4020 2010             1706  TST1.1   STH   R2,CMDADR         ADDRESS TO WHICH COMMAND SENT         ELI17060
19C8      2400                  1707           LIS   R0,0                                                      ELI17070
19CA      4000 200A             1708           STH   R0,INTCNT                                                 ELI17080
                                1709  *                                                                        ELI17090
19CE      DE20 2015             1710           OC    R2,ENST           (ENAB INTPTS, SET MODE)               ELI17100
19D2      DA20 2014             1711           WD    R2,ALLI           SET ALL LINES                         ELI17110
19D6      DE20 2017             1712           OC    R2,DSMK           (DISAB INTPTS, LOAD MASK MODE).       ELI17120
19DA      DA20 2014             1713           WD    R2,ALLI           MASK ALL LINES                        ELI17130
19DE      41F0 1F58             1714           BAL   LINK,DELAY        SHOULD NOT INTERRUPT.                 ELI17140
                                1715  *                                                                        ELI17150
19E2      DE20 2013             1716           OC    R2,ENMK           (ENAB INTPTS, LOAD MASK MODE)         ELI17160
19E6      DA20 200C             1717           WD    R2,ZERO           UNMASK ALL LINES                      ELI17170
19EA      DE20 2015             1718           OC    R2,ENST           (ENAB INTPTS, SET MODE)               ELI17180
19EE      DA20 2014             1719           WD    R2,ALLI           SET ALL LINES                         ELI17190
19F2      41F0 1F58             1720  TST1.2   BAL   LINK,DELAY        NO INTERRUPT SHOULD OCCUR             ELI17200
                                1721  *                                                                        ELI17210
                                1722  *                                                                        ELI17220
19F6      4810 1910             1723           LH    R1,DEVSADR        LINE 0 ADDRESS                        ELI17230
19FA      4820 2010             1724           LH    R2,CMDADR                                               ELI17240
19FE      2621                  1725           AIS   R2,1              DEVICE ADDRESS                        ELI17250
1A00      C521 0008             1726           CLHI  R2,8(R1)                                                ELI17260
1A04      4280 19C4             1727           BL    TST1.1            REPEAT FOR ALL LINE ADDRESSES.        ELI17270
                                1728  *                                                                        ELI17280
1A08      4300 0E5E             1729  T1END    B     TSTEND            RETURN TO EXECUTIVE.                  ELI17290
                                1730  *                                                                        ELI17300
          0000 1A0C             1731  T1INT    EQU   *                 UNEXPECTED INTERRUPTS                 ELI17310
1A0C      41F0 1DBC             1732           BAL   R15,TT02                                                ELI17320
1A10      4800 200A             1733           LH    R0,INTCNT                                               ELI17330
1A14      2601                  1734           AIS   R0,1                                                    ELI17340
1A16      4000 200A             1735           STH   R0,INTCNT                                               ELI17350
1A1A      C500 0008             1736           CLHI  R0,8                                                    ELI17360
1A1E      4280 19F2             1737           BL    TST1.2            ALLOW UP TO 8 SPUR INT                ELI17370
1A22      4300 1A08             1738           B     T1END                                                   ELI17380
                                1739  *                                                                        ELI17390
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                              *                                                                    ELI17400
                              *  ***********************************************************       ELI17410
                              *                                                                    ELI17420
                              * PURPOSE OF TEST:                                                   ELI17430
                              * TEST 2 VERIFIES THAT INTERRUPT LINES WITHIN THE MODULE MAY BE SET  ELI17440
                              * INDIVIDUALLY UNDER PROGRAM CONTROL.                                ELI17450
                              *                                                                    ELI17460
                              * ASSUMPTIONS:                                                       ELI17470
                              * IT IS ASSUMED THAT THE PROCESSOR, MEMORY, AND TELETYPE TESTS HAVE  ELI17480
                              * BEEN RUN PRIOR TO SELECTING THIS TEST.                             ELI17490
                              *                                                                    ELI17500
                              * DESIGN SPECIFICATIONS:                                             ELI17510
                              * DEVICE INTERRUPTS ARE DISABLED, AND ALL LINES ARE MASKED. A 'CLEAR' ELI17520
                              * COMMAND IS THEN ISSUED, AND A SINGLE LINE IS SET. PROCESSOR        ELI17530
                              * INTERRUPTS ARE ENABLED. A SINGLE INTERRUPT, FROM THE SET LINE,     ELI17540
                              * IS EXPECTED. THIS SEQUENCE IS REPEATED UNTIL EACH LINE HAS BEEN    ELI17550
                              * INDIVIDUALLY SET.                                                  ELI17560
                              *                                                                    ELI17570
                              * THE TEST IS REPEATED EIGHT TIMES, EACH TIME USING THE ADDRESS OF   ELI17580
                              * THE NEXT SEQUENTIAL INTERRUPT LINE AS THE DEVICE ADDRESS TO WHICH  ELI17590
                              * ALL COMMANDS ARE SENT.                                             ELI17600
                              *                                                                    ELI17610
                              * HOW TO RUN THE TEST:                                               ELI17620
                              * ENTER APPROPRIATE VALUES FOR THE TIMVAL AND DEVADR OPTIONS, SELECT ELI17630
                              * THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.     ELI17640
                              *                                                                    ELI17650
                              * OPTIONS:                                                           ELI17660
                              * TEST, DEVADR, INTLEV, CONTIN, LOOP, TIMVAL.                         ELI17670
                              *                                                                    ELI17680
                              * ERRORS:                                                            ELI17690
                              * 01,04,06,08                                                        ELI17700
                              *                                                                    ELI17710
       0000 1A26              TEST2    EQU   *                                                     ELI17720
1A26   4820 1910                       LH    R2,DEVSADR        LINE 0 ADDRESS                      ELI17730
                              *                                                                    ELI17740
1A2A   4020 2010              TST2.0   STH   R2,CMDADR         ADDRESS TO WHICH COMMAND SENT       ELI17750
1A2E   C880 0100                       LHI   R8,X'100'         INITIAL LINE SELECTED = 0           ELI17760
1A32   4080 1FB8                       STH   R8,PATSAV                                             ELI17770
                              *                                                                    ELI17780
1A36   4820 2010              TST2.05  LH    R2,CMDADR                                             ELI17790
1A3A   DE20 2017                       OC    R2,DSMK           (DISAB INTPTS, LOAD MASK MODE)      ELI17800
1A3E   DA20 2014                       WD    R2,ALLI           MASK ALL LINES                      ELI17810
1A42   DE20 2016                       OC    R2,CLRI           THEN SEND 'CLEAR' COMMAND           ELI17820
                              *                                                                    ELI17830
1A46   C810 192A              TST2.1   LHI   R1,DEVINT                                             ELI17840
1A4A   C800 1D90                       LHI   R0,TT01X          UNEXPECTED INTPT HDLR               ELI17850
1A4E   0821                            LHR   R2,R1                                                 ELI17860
1A50   4002 0000              TST2.2   STH   R0,0(R2)                                              ELI17870
1A54   2622                            AIS   R2,2                                                  ELI17880
1A56   C521 0010                       CLHI  R2,16(R1)                                             ELI17890
1A5A   2085                            BLS   TST2.2                                                ELI17900
                              *                                                                    ELI17910
1A5C   C8E0 1A8A                       LHI   R14,TST2.4        EXIT ADDRESS                        ELI17920
1A60   C890 1AA0                       LHI   R9,T2INT          VECTOR ADDRESS                      ELI17930
1A64   41F0 1F72                       BAL   R15,WALKIT        'WALKS' SELECTED LINE ACROSS MODULF ELI17940
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                     *                               AND ADJUSTS DEVINT TABLE          ELI17950
                     *                                                                 ELI17960
1A68   2400                        LIS   R0,0                                          ELI17970
1A6A   4000 200A                   STH   R0,INTCNT                                     ELI17980
1A6E   4820 2010                   LH    R2,CMDADR                                     ELI17990
1A72   DE20 2016                   OC    R2,CLRI         CLEAR ALL INTPTS              ELI18000
1A76   DE20 2015                   OC    R2,ENST         (ENAB INTPTS, SET MODE)       ELI18010
1A7A   DA20 1FB9                   WD    R2,PATSAV+1     SET SELECTED LINE             ELI18020
1A7E   41F0 1F58                   BAL   LINK,DELAY      SHOULD INTERRUPT - ONCE ONLY. ELI18030
                     *                                                                 ELI18040
1A82   41F0 1E0C                   BAL   R15,TT04        INTERRUPT TIMEOUT -      ***  ELI18050
1A86   4300 1A36                   B     TST2.05                                       ELI18060
                     *                                                                 ELI18070
1A8A   4810 1910     TST2.4        LH    R1,DEVSADR      LINE 0 ADDRESS                ELI18080
1A8E   4820 2010                   LH    R2,CMDADR                                     ELI18090
1A92   2621                        AIS   R2,1            DEVICE ADDRESS                ELI18100
1A94   C521 0008                   CLHI  R2,8(R1)                                      ELI18110
1A98   4280 1A2A                   BL    TST2.0          REPEAT FOR ALL LINE ADDRESSES. ELI18120
1A9C   4300 1AD0                   B     T2END                                         ELI18130
                     *                                                                 ELI18140
1AA0   4860 1F86     T2INT         LH    R6,WALKSV       CURRENT LINE POINTER          ELI18150
1AA4   C870 1ED2                   LHI   R7,TT08X        DOUBLE INTERRUPT VECTOR       ELI18160
1AA8   4076 0000                   STH   R7,0(R6)                                      ELI18170
                     *                                                                 ELI18180
1AAC   CB60 192A                   SHI   R6,DEVINT                                     ELI18190
1AB0   9061                        SRLS  R6,1                                          ELI18200
1AB2   4A60 185E                   AH    R6,DEVADR+6     LINE 0 ADDRESS                ELI18210
1AB6   4560 1720                   CLH   R6,INTDEV                                     ELI18220
1ABA   2337                        BES   T2INT.1                                       ELI18230
1ABC   4870 1720                   LH    R7,INTDEV                                     ELI18240
1AC0   4070 2006                   STH   R7,EXPDEV                                     ELI18250
1AC4   41F0 1E7C                   BAL   R15,TT06                                      ELI18260
1AC8   41F0 1F58     T2INT.1       BAL   LINK,DELAY      WAIT FOR MORE INTPTS.         ELI18270
1ACC   4300 1A46                   B     TST2.1          MOVE TO NEXT LINE             ELI18280
                     *                                                                 ELI18290
1AD0   4300 0E5E     T2END         B     TSTEND                                        ELI18300
                     *                                                                 ELI18310
                     *                                                                 ELI18320
                     *                                                                 ELI18330
                     *   ***************************************************************  ELI18340
                     *                                                                 ELI18350
                     * PURPOSE OF TEST:                                                ELI18360
                     * TEST 3 VERIFIES THAT INTERRUPT LINES WITHIN THE MODULE MAY BE   ELI18370
                     * MASKED INDIVIDUALLY UNDER PROGRAM CONTROL.                       ELI18380
                     *                                                                 ELI18390
                     * ASSUMPTIONS:                                                    ELI18400
                     * IT IS ASSUMED THAT THE PROCESSOR, MEMORY, AND TELETYPE TESTS HAVE ELI18410
                     * BEEN RUN PRIOR TO SELECTING THIS TEST.                          ELI18420
                     *                                                                 ELI18430
                     * DESIGN SPECIFICATIONS:                                          ELI18440
                     * DEVICE INTERRUPTS ARE ENABLED, AND ALL LINES ARE SET. A SINGLE  ELI18450
                     * LINE IS MASKED, AND PROCESSOR INTERRUPTS ARE ENABLED. A SINGLE  ELI18460
                     * INTERRUPT, FROM THE MASKED LINE, IS EXPECTED. THIS SEQUENCE IS  ELI18470
                     * REPEATED UNTIL EACH LINE HAS BEEN INDIVIDUALLY MASKED.          ELI18480
                     *                                                                 ELI18490
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                                1850  * THE TEST IS REPEATED EIGHT TIMES, EACH TIME USING THE ADDRESS OF      ELI18500
                                1851  * THE NEXT SEQUENTIAL INTERRUPT LINE AS THE DEVICE ADDRESS TO WHICH   ELI18510
                                1852  * ALL COMMANDS ARE SENT.                                              ELI18520
                                1853  *                                                                     ELI18530
                                1854  * HOW TO RUN THE TEST:                                               ELI18540
                                1855  * ENTER APPROPRIATE VALUES FOR THE TIMVAL AND DEVADR OPTIONS, SELECT  ELI18550
                                1856  * THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.      ELI18560
                                1857  *                                                                     ELI18570
                                1858  * OPTIONS:                                                           ELI18580
                                1859  * TEST, DEVADR, INTLEV, CONTIN, LOOP, TIMVAL.                        ELI18590
                                1860  *                                                                     ELI18600
                                1861  * ERRORS:                                                            ELI18610
                                1862  * 03,04,08                                                           ELI18620
                                1863  *                                                                     ELI18630
      0000 1AD4                 1864  TEST3    EQU   *                                                     ELI18640
1AD4  4820 1910                 1865           LH    R2,DEVSADR        LINE 0 ADDRESS                      ELI18650
                                1866  *                                                                     ELI18660
1AD8  4020 2010                 1867  TST3.0   STH   R2,CMDADR         ADDRESS TO WHICH COMMAND SENT       ELI18670
1ADC  C880 0100                 1868           LHI   R8,X'100'         TO SELECT FIRST LINE = LINE 0       ELI18680
1AE0  4080 1FB8                 1869           STH   R8,PATSAV                                             ELI18690
1AE4  2400                      1870           LIS   R0,0                                                  ELI18700
1AE6  4000 200A                 1871           STH   R0,INTCNT         INIT COUNT.                         ELI18710
                                1872  *                                                                     ELI18720
1AEA  C860 1B7C                 1873  TST3.1   LHI   R6,T3INT.4                                           ELI18730
1AEE  C870 192A                 1874           LHI   R7,DEVINT                                             ELI18740
1AF2  4067 0000                 1875  TST3.2   STH   R6,0(R7)          UNEXPECTED INTPT POINTERS           ELI18750
1AF6  2672                      1876           AIS   R7,2                                                  ELI18760
1AF8  C570 193A                 1877           CLHI  R7,DEVINT+16                                          ELI18770
1AFC  2085                      1878           BLS   TST3.2                                                ELI18780
                                1879  *                                                                     ELI18790
1AFE  C890 1B44                 1880  TST3.3   LHI   R9,T3INT          MASKED LINE INTPT VECTOR            ELI18800
1B02  C8E0 1B2A                 1881           LHI   R14,TST3.5        EXIT ADDRESS                        ELI18810
1B06  41F0 1F72                 1882           BAL   R15,WALKIT        SELECT LINE; SET UP FOR TEST.       ELI18820
                                1883  *                                                                     ELI18830
1B0A  4820 2010                 1884  TST3.4   LH    R2,CMDADR                                             ELI18840
1B0E  DE20 2015                 1885           OC    R2,ENST           (ENAB INTPTS, SET MODE)             ELI18850
1B12  DA20 2014                 1886           WO    R2,ALLI           SET ALL LINES                       ELI18860
1B16  DE20 2013                 1887           OC    R2,ENMK           (ENAB INTPTS, LOAD MASK MODE)       ELI18870
1B1A  DA20 1FB9                 1888           WO    R2,PATSAV+1       MASK SELECTED LINE                  ELI18880
1B1E  41F0 1F58                 1889           BAL   LINK,DELAY                                            ELI18890
1B22  41F0 1E0C                 1890           BAL   R15,TT04          SOFTWARE TIMEOUT                    ELI18900
1B26  4300 1AEA                 1891           B     TST3.1            TRY NEXT PATTERN IF TIMEOUT         ELI18910
                                1892  *                                                                     ELI18920
                                1893  *                                                                     ELI18930
      0000 1B2A                 1894  TST3.5   EQU   *                 COME HERE FROM T3INT WHEN           ELI18940
                                1895  *                               ALL LINES CHECKED, CURRENT PATTERN.  ELI18950
1B2A  41F0 1F58                 1896           BAL   LINK,DELAY        SHOULD NOT INTERRUPT                ELI18960
1B2E  4810 1910                 1897           LH    R1,DEVSADR        LINE 0 ADDRESS                      ELI18970
1B32  4820 2010                 1898           LH    R2,CMDADR                                             ELI18980
1B36  2621                      1899           AIS   R2,1                                                  ELI18990
1B38  C521 0008                 1900           CLHI  R2,8(R1)                                            ELI19000
1B3C  4280 1AD8                 1901           BL    TST3.0            RUN WITH NEXT LINE ADDRESS          ELI19010
                                1902  *                                                                     ELI19020
      0000 1B40                 1903  T3END    EQU   *                                                     ELI19030
1B40  4300 0E5E                 1904           B     TSTEND            RETURN TO EXECUTIVE.                ELI19040
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                                1905  *                                                                    ELI19050
                                1906  *                                                                    ELI19060
                                1907  *                                                                    ELI19070
      0000 1B44                 1908  T3INT    EQU   *              EXPECTED INTERRUPT RECEIVED             ELI19080
1B44  C870 192A                 1909           LHI   R7,DEVINT      VECTOR TABLE                            ELI19090
1B48  4867 0000                 1910  T3INT.1  LH    R6,0(R7)       PICK UP VECTOR                          ELI19100
1B4C  C560 1B44                 1911           CLHI  R6,T3INT       DOES IT POINT HERE ?                    ELI19110
1B50  4330 1B5C                 1912           BE    T3INT.2        YES -                                   ELI19120
1B54  2672                      1913           AIS   R7,2                                                   ELI19130
1B56  C570 193A                 1914           CLHI  R7,DEVINT+16                                           ELI19140
1B5A  2089                      1915           BLS   T3INT.1                                                ELI19150
                                1916  *                                                                    ELI19160
1B5C  C860 1ED2                 1917  T3INT.2  LHI   R6,TT08X       DOUBLE INTERRUPT HANDLER                ELI19170
1B60  4067 0000                 1918           STH   R6,0(R7)                                              ELI19180
1B64  C870 192A                 1919           SHI   R7,DEVINT                                              ELI19190
1B68  9071                      1920           SRLS  R7,1           CORRESPONDING LINE ADDRESS              ELI19200
1B6A  4A70 185E                 1921           AH    R7,DEVADR+6    LINE 0 ADDRESS                          ELI19210
1B6E  4570 1720                 1922           CLH   R7,INTDEV      DID THE CORRECT DEVICE INTERRUPT ?      ELI19220
1B72  2135                      1923           BNES  T3INT.4                                                ELI19230
                                1924  *                            .  WHEN MASKED.                         ELI19240
1B74  41F0 1F58                 1925  T3INT.3  BAL   LINK,DELAY                                            ELI19250
1B78  4300 1AEA                 1926           B     TST3.1                                                 ELI19260
                                1927  *                                                                    ELI19270
1B7C  41F0 1DE4                 1928  T3INT.4  BAL   R15,TT03       WRONG LINE INTERRUPTED                  ELI19280
1B80  4800 200A                 1929           LH    R0,INTCNT                                              ELI19290
1B84  2601                      1930           AIS   R0,1                                                   ELI19300
1B86  4000 200A                 1931           STH   R0,INTCNT                                              ELI19310
1B8A  C500 0008                 1932           CLHI  R0,8           ALLOW UP TO 8 SPUR INT.                 ELI19320
1B8E  4280 1B74                 1933           BL    T3INT.3                                                ELI19330
1B92  4300 1B40                 1934           B     T3END                                                  ELI19340
                                1935  *                                                                    ELI19350
                                1936  *  ************************************************************      ELI19360
                                1937  *                                                                    ELI19370
                                1938  * PURPOSE OF TEST:                                                  ELI19380
                                1939  * TEST 4 VERIFIES THAT INTERRUPT LINES WITHIN THE MODULE MAY BE RESET ELI19390
                                1940  * INDIVIDUALLY UNDER PROGRAM CONTROL.                               ELI19400
                                1941  *                                                                    ELI19410
                                1942  * ASSUMPTIONS:                                                      ELI19420
                                1943  * IT IS ASSUMED THAT THE PROCESSOR, MEMORY, AND TELETYPE TESTS HAVE ELI19430
                                1944  * BEEN RUN PRIOR TO SELECTING THIS TEST.                            ELI19440
                                1945  *                                                                    ELI19450
                                1946  * DESIGN SPECIFICATIONS:                                            ELI19460
                                1947  * DEVICE INTERRUPTS ARE DISABLED, AND ALL LINES ARE MASKED.         ELI19470
                                1948  * DEVICE INTERRUPTS ARE ENABLED, ALL LINES                          ELI19480
                                1949  * ARE SET, AND A SINGLE LINE IS RESET, PROCESSOR INTERRUPTS ARE     ELI19490
                                1950  * ENABLED. SEVEN INTERRUPTS, ONE FROM EACH LINE EXCEPT THE LINE RESET, ELI19500
                                1951  * ARE EXPECTED. THIS SEQUENCE IS REPEATED UNTIL EACH LINE HAS BEEN  ELI19510
                                1952  * INDIVIDUALLY RESET.                                              ELI19520
                                1953  *                                                                    ELI19530
                                1954  * THE TEST IS REPEATED EIGHT TIMES, EACH TIME USING THE ADDRESS OF  ELI19540
                                1955  * THE NEXT SEQUENTIAL INTERRUPT LINE AS THE DEVICE ADDRESS TO WHICH ELI19550
                                1956  * ALL COMMANDS ARE SENT.                                            ELI19560
                                1957  *                                                                    ELI19570
                                1958  * HOW TO RUN THE TEST:                                              ELI19580
                                1959  * ENTER APPROPRIATE VALUES FOR THE TIMVAL AND DEVADR OPTIONS, SELECT ELI19590
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                                1960  * THE TEST, AND ENTER 'RUN'. NO MANUAL INTERVENTION IS REQUIRED.   ELI19600
                                1961  *                                                                  ELI19610
                                1962  * OPTIONS:                                                        ELI19620
                                1963  * TEST, DEVADR, INTLEV, CONTIN, LOOP, TIMVAL.                     ELI19630
                                1964  *                                                                  ELI19640
                                1965  * ERRORS:                                                         ELI19650
                                1966  * 04,05,06,08                                                     ELI19660
                                1967  *                                                                  ELI19670
      0000 1B96                 1968  TEST4     EQU   *                                                  ELI19680
1B96  4620 1910                 1969            LH    R2,DEVSADR        LINE 0 ADDRESS                 ELI19690
                                1970  *                                                                  ELI19700
1B9A  4020 2010                 1971  TST4.0    STH   R2,CMDADR         ADDRESS TO WHICH COMMAND SENT  ELI19710
1B9E  C880 0100                 1972            LHI   R8,X'100'         TO SELECT FIRST LINE = LINE 0  ELI19720
1BA2  4080 1FB8                 1973            STH   R8,PATSAV                                        ELI19730
                                1974  *                                                                  ELI19740
1BA6  C860 1C10                 1975  TST4.1    LHI   R6,T4INT                                         ELI19750
1BAA  C870 192A                 1976            LHI   R7,DEVINT                                        ELI19760
1BAE  4067 0000                 1977  TST4.2    STH   R6,0(R7)          EXPECTED INTERRUPT POINTERS    ELI19770
1BB2  2672                      1978            AIS   R7,2                                             ELI19780
1BB4  C570 193A                 1979            CLHI  R7,DEVINT+16                                     ELI19790
1BB8  2085                      1980            BLS   TST4.2                                           ELI19800
                                1981  *                                                                  ELI19810
1BBA  C890 1C62                 1982  TST4.3    LHI   R9,T4INT.4        UNMASKED LINE INTERRUPT VECTOR ELI19820
1BBE  C8E0 1BF6                 1983            LHI   R14,TST4.6        EXIT ADDRESS                   ELI19830
1BC2  41F0 1F72                 1984            BAL   R15,WALKIT        SELECT LINE: SET UP FOR TEST.  ELI19840
                                1985  *                                                                  ELI19850
1BC6  4820 2010                 1986  TST4.4    LH    R2,CMDADR                                        ELI19860
1BCA  DE20 2017                 1987            OC    R2,DSMK           (DISAB INTPTS, LOAD MASK MODE) ELI19870
1BCE  DA20 2014                 1988            WD    R2,ALLI           MASK ALL INTPTS                ELI19880
1BD2  DE20 2015                 1989            OC    R2,ENST           (ENAB INTPTS, SET MODE)        ELI19890
1BD6  DA20 2014                 1990            WD    R2,ALLI           SET ALL LINES                  ELI19900
1BDA  DE20 2012                 1991            OC    R2,ENRT           (ENAB INTPTS, RESET MODE)      ELI19910
1BDE  D380 1FB9                 1992            LB    R8,PATSAV+1                                      ELI19920
1BE2  9A28                      1993            WDR   R2,R8             RESET TEST BIT                 ELI19930
                                1994  *                                                                  ELI19940
1BE4  2400                      1995            LIS   R0,0                                             ELI19950
1BE6  4000 200A                 1996            STH   R0,INTCNT         RESET COUNTER                  ELI19960
1BEA  41F0 1F58                 1997  TST4.5    BAL   LINK,DELAY        WAIT FOR INTERRUPTS            ELI19970
1BEE  41F0 1E0C                 1998            BAL   R15,TT04          SOFTWARE TIMEOUT               ELI19980
1BF2  4300 1BA6                 1999            B     TST4.1            TRY NEXT PATTERN ON TIMEOUT    ELI19990
                                2000  *                                                                  ELI20000
                                2001  *                                                                  ELI20010
1BF6  41F0 1F58                 2002  TST4.6    BAL   LINK,DELAY        SHOULD NOT INTERRUPT.          ELI20020
1BFA  4810 1910                 2003            LH    R1,DEVSADR        LINE 0 ADDRESS                 ELI20030
1BFE  4820 2010                 2004            LH    R2,CMDADR                                        ELI20040
1C02  2621                      2005            AIS   R2,1                                             ELI20050
1C04  C521 0008                 2006            CLHI  R2,8(R1)                                         ELI20060
1C08  4280 1B9A                 2007            BL    TST4.0            RUN WITH NEXT LINE ADDRESS.    ELI20070
                                2008  *                                                                  ELI20080
      0000 1C0C                 2009  T4END     EQU   *                                                  ELI20090
1C0C  4300 0E5E                 2010            B     TSTEND            RETURN TO EXECUTIVE.           ELI20100
                                2011  *                                                                  ELI20110
                                2012  *                                                                  ELI20120
                                2013  *                                                                  ELI20130
      0000 1C10                 2014  T4INT     EQU   *                 EXPECTED INTERRUPT RECEIVED.   ELI20140
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1C10  C870 192A  2015          LHI   R7,DEVINT          VECTOR TABLE                          ELI20150
1C14  4867 0000  2016  T4INT.1  LH    R6,0(R7)           PICK UP VECTOR                        ELI20160
1C18  C560 1C10  2017          CLHI  R6,T4INT           DOES IT POINT HERE ?                  ELI20170
1C1C  4330 1C28  2018          BE    T4INT.2            YES -                                 ELI20180
1C20  2672       2019          AIS   R7,2                                                     ELI20190
1C22  C570 193A  2020          CLHI  R7,DEVINT+16                                            ELI20200
1C26  2089       2021          BLS   T4INT.1                                                 ELI20210
                 2022  *                                                                     ELI20220
1C28  C860 1ED2  2023  T4INT.2  LHI   R6,TT08X           DOUBLE INTERRUPT HDLR                 ELI20230
1C2C  4067 0000  2024          STH   R6,0(R7)                                                ELI20240
1C30  CB70 192A  2025          SHI   R7,DEVINT                                               ELI20250
1C34  9071       2026          SRLS  R7,1               CORRESPONDING LINE ADDRESS           ELI20260
1C36  4A70 185E  2027          AH    R7,DEVADR+6        LINE 0 ADDRESS                       ELI20270
1C3A  4570 1720  2028          CLH   R7,INTDEV          DID CORRECT DEVICE INTERRUPT ?       ELI20280
1C3E  2335       2029          BES   T4INT.3                                                 ELI20290
1C40  4070 2006  2030          STH   R7,EXPDEV          EXPECTED DVADR ON INTERRUPT          ELI20300
1C44  41F0 1E3E  2031          BAL   R15,TT05           ERROR TT05 - LINE INTERRUPTED        ELI20310
                 2032  *                                 OUT OF SEQUENCE                    ELI20320
1C48  48F0 200A  2033  T4INT.3  LH    R15,INTCNT         HOW MANY TIMES, NOW ?                 ELI20330
1C4C  26F1       2034          AIS   R15,1                                                   ELI20340
1C4E  40F0 200A  2035          STH   R15,INTCNT                                              ELI20350
1C52  C5F0 0007  2036          CLHI  R15,7              ENOUGH ?                             ELI20360
1C56  4280 1BEA  2037          BL    TST4.5             NO.                                  ELI20370
1C5A  41F0 1F58  2038          BAL   LINK,DELAY         EXTRA INTPT QUEUED ?                 ELI20380
1C5E  4300 18A6  2039          B     TST4.1             TRY NEXT PATTERN                     ELI20390
                 2040  *                                                                     ELI20400
1C62  487C 1FB6  2041  T4INT.4  LH    R7,WALKSV                                             ELI20410
1C66  C860 1ED2  2042          LHI   R6,TT08X                                                ELI20420
1C6A  4067 0000  2043          STH   R6,0(R7)                                                ELI20430
1C6E  CB70 192A  2044          SHI   R7,DEVINT                                               ELI20440
1C72  9071       2045          SRLS  R7,1                                                    ELI20450
1C74  4A70 185E  2046          AH    R7,DEVADR+6                                             ELI20460
1C78  4070 2006  2047          STH   R7,EXPDEV                                               ELI20470
1C7C  41F0 1E7C  2048          BAL   R15,TT06           INTERRUPT WHEN RESET                 ELI20480
1C80  4300 1C48  2049          B     T4INT.3            CONTINUE                             ELI20490
                 2050  *                                                                     ELI20500
                 2051  *                                                                     ELI20510
                 2052  *                                                                     ELI20520
                 2053  *  ************************************************************       ELI20530
                 2054  *                                                                     ELI20540
                 2055  *                                                                     ELI20550
                 2056  * PURPOSE OF TEST:                                                    ELI20560
                 2057  * TEST 5 VERIFIES THAT INTERRUPTS MAY BE GENERATED BY MANUALLY        ELI20570
                 2058  * CONNECTING CERTAIN PINS ON CONNECTOR 'A' OF THE 7" 29-237           ELI20580
                 2059  * EIGHT LINE INTERRUPT MODULE (SEE PAGE 6 OF 06-134R03A15)           ELI20590
                 2060  *                                                                     ELI20600
                 2061  * ASSUMPTIONS:                                                       ELI20610
                 2062  * IT IS ASSUMED THAT THE PROCESSOR, MEMORY, AND TELETYPE TESTS HAVE   ELI20620
                 2063  * BEEN RUN PRIOR TO SELECTING THIS TEST.                             ELI20630
                 2064  *                                                                     ELI20640
                 2065  * DESIGN SPECIFICATIONS:                                             ELI20650
                 2066  * A 'CLEAR' COMMAND IS ISSUED, DEVICE INTERRUPTS ARE ENABLED AND ALL ELI20660
                 2067  * LINES ARE MASKED. THE MESSAGE 'GENERATE INTERRUPT' IS PRINTED ON THE ELI20670
                 2068  * CONSOLE. PROCESSOR INTERRUPTS ARE ENABLED, AND THE PROGRAM WAITS   ELI20680
                 2069  * SEVERAL SECONDS FOR AN INTERRUPT.AFTER AN INTERRUPT HAS OCCURRED    ELI20690
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                                2070  * THE PROGRAM PRINTS OUT THE DEVICE ADDRESS AND STATUS. IT THEN          ELI20700
                                2071  * WAITS FOR ANY QUEUED INTERRUPTS. IF NO INTERRUPTS OCCUR THE           ELI20710
                                2072  * PROGRAM PRINTS OUT 'NO MORE INTERRUPTS'.THIS PROCESS IS REPEATED      ELI20720
                                2073  * EIGHT TIMES, THE TEST TERMINATES.                                     ELI20730
                                2074  *                                                                       ELI20740
                                2075  * HOW TO RUN THE TEST:                                                  ELI20750
                                2076  * ENTER APPROPRIATE VALUES FOR THE TIMVAL AND DEVADR OPTIONS, SELECT    ELI20760
                                2077  * THE TEST, AND ENTER 'RUN', THE PROGRAM DELAYS APPROX. 20 SECONDS      ELI20770
                                2078  * WAITING FOR AN INTERRUPT. CONNECT PIN 200-A ON THE INTERRUPT          ELI20780
                                2079  * MODULE BOARD TO PINS 100-A, 102-A,...., 114A TO MANUALLY GENERATE     ELI20790
                                2080  * INTERRUPTS ON LINES 0-7, RESPECTIVELY.                                ELI20800
                                2081  * OPTIONS:                                                             ELI20810
                                2082  * TEST, DEVADR, INTLEV, CONTIN, LOOP, TIMVAL.                          ELI20820
                                2083  *                                                                       ELI20830
                                2084  * ERRORS:                                                              ELI20840
                                2085  * 03,07                                                                ELI20850
                                2086  *                                                                       ELI20860
                                2087  *                                                                       ELI20870
     0000 1C84                  2088  TEST5    EQU   *              MANUAL INTERRUPT TEST                    ELI20980
                                2089  *                                                                       ELI20890
1C84 2400                       2090  TST5.0   LIS   R0,0                                                    ELI20900
1C86 4000 200A                  2091           STH   R0,INTCNT      INTIALIZE COUNT                          ELI20910
                                2092  *                                                                       ELI20920
1C8A C810 192A                  2093  TST5.1   LHI   R1,DEVINT                                               ELI20930
1C8E C800 1D60                  2094           LHI   R0,T5INT       INTERRUPT VECTOR                         ELI20940
1C92 0821                       2095           LHR   R2,R1                                                    ELI20950
1C94 4002 0000                  2096  TST5.11  STH   R0,0(R2)       EXPECTED INTERRUPT HOLDER                ELI20960
1C98 2622                       2097           AIS   R2,2                                                     ELI20970
1C9A C521 0010                  2098           CLHI  R2,16(R1)                                                ELI20980
1C9E 2085                       2099           BLS   TST5.11                                                  ELI20990
                                2100  *                                                                       ELI21000
1CA0 4820 1910                  2101           LH    R2,DEVSADR     LINE '0' ADDRESS                         ELI21010
1CA4 4020 2010                  2102           STH   R2,CMDADR                                                ELI21020
                                2103  *                                                                       ELI21030
1CA8 2501                       2104  TST5.2   LCS   R0,1                                                    ELI21040
1CAA DE20 2016                  2105           OC    R2,CLRI        CLEAR ALL LINES                          ELI21050
1CAE DE20 2012                  2106           OC    R2,ENRT                                                  ELI21060
1CB2 9A20                       2107           WDR   R2,R0          RESET ALL LINES                          ELI21070
1CB4 DE20 2013                  2108           OC    R2,ENMK        (ENAB INTPTS, LOAD MASK CODE)            ELI21080
1CB8 2400                       2109           LIS   R0,0                                                     ELI21090
1CBA 9A20                       2110           WDR   R2,R0          UNMASK ALL LINES                         ELI21100
1CBC DE20 2013                  2111           OC    R2,ENMK                                                  ELI21110
1CC0 DA20 2014                  2112           WD    R2,ALLI        MASK ALL LINES                           ELI21120
                                2113  *                                                                       ELI21130
1CC4 C850 18C4                  2114           LHI   R5,MESSAGE                                               ELI21140
1CC8 41F0 11F0                  2115           BAL   R15,PRINT      'GENERATE INTERRUPT'                     ELI21150
1CCC 2571                       2116           LCS   R7,1                                                     ELI21160
1CCE 4070 2018                  2117           STH   R7,MSK         INTIALIZE MASK VALUE                   E ELI21170
                                2118  *                                                                       ELI21180
1CD2 C800 0600                  2119           LHI   R0,X'0600'                                               ELI21190
1CD6 41F0 1110                  2120           BAL   LINK,TIMER     WAIT FOR SOME MILLISECONDS....           ELI21200
1CDA 41F0 1F58                  2121           BAL   LINK,DELAY     CHECK FOR INTERRUPT                      ELI21210
1CDE 41F0 1358                  2122           BAL   LINK,TSTBRK                                              ELI21220
1CE2 41F0 1EBA                  2123           BAL   R15,TT07       TIMEOUT- NO INTERRUPT.                   ELI21230
1CE6 4300 1D42                  2124           B     TST5.4                                                   ELI21240
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                        2125  *                                                                    ELI21250
                        2126  *                                                                    ELI21260
1CEA  4880 1720         2127  TST5.3   LH    R8,INTDEV       CHECK FOR QUEUED INTERRUPTS       E  ELI21270
1CEE  4880 1910         2128           SH    R8,DEVSADR      LINE NUMBER IN REG.8                 ELI21280
1CF2  C870 0100         2129           LHI   R7,X'100'                                            ELI21290
1CF6  CC78 0000         2130           SRHL  R7,0(R8)        SHIFT                                ELI21300
1CFA  4070 1FB8         2131           STH   R7,PATSAV       STORE PATTERN IN PATSAV              ELI21310
1CFE  C890 1D58         2132           LHI   R9,T5ERR        UNEXPECTED INTERRUPT VECTOR          ELI21320
1D02  C8E0 1C8A         2133           LHI   R14,TST5.1      DUMMY EXIT                           ELI21330
1D06  41F0 1F72         2134           BAL   LINK,WALKIT     STORE ERROR VECTOR IN DEVICE         ELI21340
1D0A  4810 1FB8         2135           LH    R1,PATSAV       INTRPT HOLDER FOR LINE WHICH         ELI21350
1D0E  4710 2018         2136           XH    R1,MSK          JUST INTERRUPTED.                 F  ELI21360
1D12  4010 2018         2137           STH   R1,MSK          E                                    ELI21370
1D16  4820 1910         2138           LH    R2,DEVSADR                                           ELI21380
1D1A  0E20 2012         2139           OC    R2,ENRT         RESET  THE LINE WHICH INTRP'ED    EL ELI21390
1D1E  DA20 1FB9         2140           WD    R2,PATSAV+1                                          ELI21400
1D22  0E20 2013         2141           OC    R2,ENMK                                              ELI21410
1D26  DA20 2019         2142           WD    R2,MSK+1        MASK OUT LINES WHICH HAVE INTRP'D    ELI21420
1D2A  41F0 1F58         2143           BAL   LINK,DELAY      CHECK FOR MORE INTERRUPTS            ELI21430
1D2E  41F0 1358         2144           BAL   LINK,TSTBRK                                          ELI21440
1D32  4800 183A         2145           LH    R0,NOMSG+6      COMMENTS ALLOWED?                    ELI21450
1D36  4230 1D42         2146           BNZ   TST5.4                                               ELI21460
1D3A  C850 18FC         2147           LHI   R5,QUEMSG                                            ELI21470
1D3E  41F0 11F0         2148           BAL   LINK,PRINT      PRINT 'NO MORE INTERRUPTS'           ELI21480
                        2149  *                                                                    ELI21490
1D42  4800 200A         2150  TST5.4   LH    R0,INTCNT       TIMEOUT OR INTPT-INCREMENT COUNT     ELI21500
1D46  2601              2151           AIS   R0,1                                                 ELI21510
1D48  4000 200A         2152           STH   R0,INTCNT                                            ELI21520
1D4C  C500 0008         2153           CLHI  R0,8                                                 ELI21530
1D50  4230 1C8A         2154           BNE   TST5.1          ALLOW 8 TIMEOUTS,INTPTS              ELI21540
      0000 1D54         2155  T5END    EQU   *                                                    ELI21550
1D54  4300 0E5E         2156           B     TSTEND                                               ELI21560
                        2157  *                                                                    ELI21570
1D58  C8F0 1CEA         2158  T5ERR    LHI   R15,TST5.3      HERE WHEN DEVICE INTERRUPTS          ELI21580
1D5C  4300 1DF4         2159           B     TT03            TWICE OR MORE                        ELI21590
                        2160  *                                                                    ELI21600
      0000 1D60         2161  T5INT    EQU   *               HERE WHEN MODULE INTERRUPTS.         ELI21610
                        2162  *                             ALL DEVICE ADDRESS CHECKING          ELI21620
                        2163  *                             DONE BY SUPERVISOR; TIMEOUT CHECK    ELI21630
                        2164  *                             BY TST5.4.                           ELI21640
      0000 1D60         2165  PRTDS    EQU   *               PRINTS 'DEV DDD STA SS' COMMENT      ELI21650
1D60  D000 2130         2166           STM   R0,ERRSAVE+64                                        ELI21660
1D64  2403              2167           LIS   R0,3                                                 ELI21670
1D66  4810 1720         2168           LH    R1,INTDEV                                            ELI21680
1D6A  C820 17BC         2169           LHI   R2,ASCIDEV                                           ELI21690
1D6E  41F0 1190         2170           BAL   LINK,HEXASC                                          ELI21700
1D72  2402              2171           LIS   R0,2                                                 ELI21710
1D74  D310 1722         2172           LB    R1,INTSTA                                            ELI21720
1D78  C820 17C4         2173           LHI   R2,ASCISTA                                           ELI21730
1D7C  41F0 1190         2174           BAL   LINK,HEXASC                                          ELI21740
1D80  C850 17B8         2175           LHI   R5,DEVMSG                                            ELI21750
1D84  41F0 11F0         2176           BAL   LINK,PRINT      'DEV DDD STA SS'                     ELI21760
1D88  D100 2130         2177           LM    R0,ERRSAVE+64                                        ELI21770
1D8C  4300 1CEA         2178           B     TST5.3          DO ANOTHER TIME.                 E  ELI21780
                        2179  *                                                                    ELI21790
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                        2180  *                                                                    ELI21800
                        2181  *                                                                    ELI21810
1D90    C8F0 0E5E       2182  TT01X    LHI   R15,TSTEND        SPVSR RETURN                       ELI21820
        0000 1D94       2183  TT01     EQU   *                 INTERRUPT AFTER 'CLEAR' COMMAND     ELI21830
1D94    40F0 1F56       2184           STH   R15,LINKSAV                                          ELI21840
1D98    40F0 174E       2185           STH   R15,ISITERR       FORCE ERROR PRINT                  ELI21850
1D9C    C800 3031       2186           LHI   R0,C'01'                                             ELI21860
1DA0    4000 179A       2187           STH   R0,ERRNO                                             ELI21870
1DA4    41E0 102A       2188           BAL   R14,ERR1          'ERROR TT01'                       ELI21880
1DA8    4800 1720       2189           LH    R0,INTDEV                                            ELI21890
1DAC    4000 1720       2190           STH   R0,ERRDEV                                            ELI21900
1DB0    41E0 1034       2191           BAL   R14,ERRD1         'DEV DDD'                          ELI21910
1DB4    4300 1F1A       2192           B     TSTENDX                                              ELI21920
                        2193  *                                                                    ELI21930
1DB8    C8F0 0E5E       2194  TT02X    LHI   R15,TSTEND        SPVSR RETURN                       ELI21940
        0000 1DBC       2195  TT02     EQU   *                 INTERRUPT WHILE DISABLED           ELI21950
1DBC    40F0 1F56       2196           STH   R15,LINKSAV                                          ELI21960
1DC0    40F0 174E       2197           STH   R15,ISITERR                                          ELI21970
1DC4    C800 3032       2198           LHI   R0,C'02'                                             ELI21980
1DC8    4000 179A       2199           STH   R0,ERRNO                                             ELI21990
1DCC    41E0 102A       2200           BAL   R14,ERR1          'ERROR TT02'                       ELI22000
1DD0    4800 1720       2201           LH    R0,INTDEV                                            ELI22010
1DD4    4000 1720       2202           STH   R0,ERRDEV                                            ELI22020
1DD8    41E0 1034       2203           BAL   R14,ERRD1         'DEV DDD'                          ELI22030
1DDC    4300 1F1A       2204           B     TSTENDX                                              ELI22040
                        2205  *                                                                    ELI22050
1DE0    C8F0 0E5E       2206  TT03X    LHI   R15,TSTEND        SPVSR RETURN                       ELI22060
        0000 1DE4       2207  TT03     EQU   *                 INTERRUPT WHILE MASKED             ELI22070
1DE4    40F0 1F56       2208           STH   R15,LINKSAV                                          ELI22080
1DE8    40F0 174E       2209           STH   R15,ISITERR                                          ELI22090
1DEC    C800 3033       2210           LHI   R0,C'03'                                             ELI22100
1DF0    4000 179A       2211           STH   R0,ERRNO                                             ELI22110
1DF4    41E0 102A       2212           BAL   R14,ERR1          'ERROR TT03'                       ELI22120
1DF8    4800 1720       2213           LH    R0,INTDEV                                            ELI22130
1DFC    4000 1720       2214           STH   R0,ERRDEV                                            ELI22140
1E00    41E0 1034       2215           BAL   R14,ERRD1         'DEV DDD'                          ELI22150
1E04    4300 1F1A       2216           B     TSTENDX                                              ELI22160
                        2217  *                                                                    ELI22170
1E08    C8F0 0E5E       2218  TT04X    LHI   R15,TSTEND        SPVSR RETURN                       ELI22180
        0000 1E0C       2219  TT04     EQU   *                 INTERRUPT TIMEOUT                  ELI22190
1E0C    40F0 1F56       2220           STH   R15,LINKSAV                                          ELI22200
1E10    40F0 174E       2221           STH   R15,ISITERR                                          ELI22210
1E14    C800 3034       2222           LHI   R0,C'04'                                             ELI22220
1E18    4000 179A       2223           STH   R0,ERRNO                                             ELI22230
1E1C    41E0 102A       2224           BAL   R14,ERR1          'ERROR TT04'                       ELI22240
1E20    4800 1FB6       2225           LH    R0,WALKSV         POINTER SAVE                       ELI22250
1E24    C800 192A       2226           SHI   R0,DEVINT         DEVINT TABLE START                 ELI22260
1E28    9001            2227           SRLS  R0,1              (R0) = DEVICE ADDRESS              ELI22270
1E2A    4A00 185E       2228           AH    R0,DEVADR+6       LINE 0 ADDRESS                     ELI22280
1E2E    4000 1720       2229           STH   R0,ERRDEV                                            ELI22290
1E32    41E0 1034       2230           BAL   R14,ERRD1         'DEV DDD'                          ELI22300
1E36    4300 1F1A       2231           B     TSTENDX                                              ELI22310
                        2232  *                                                                    ELI22320
1E3A    C8F0 0E5E       2233  TT05X    LHI   R15,TSTEND        SPVSR RETURN                       ELI22330
        0000 1E3E       2234  TT05     EQU   *                 WRONG INTERRUPT LINE (PRIORITY)    ELI22340
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1E3E  40F0 1F56          2235           STH   R15,LINKSAV                              ELI22350
1E42  40F0 174E          2236           STH   R15,ISITERR                              ELI22360
1E46  C800 3035          2237           LHI   R0,C'05'                                 ELI22370
1E4A  4000 179A          2238           STH   R0,ERRNO                                 ELI22380
1E4E  41E0 102A          2239           BAL   R14,ERR1          'ERROR TT05'           ELI22390
1E52  4800 1720          2240           LH    R0,INTDEV                                ELI22400
1E56  4000 1720          2241           STH   R0,ERRDEV                                ELI22410
1E5A  41E0 1034          2242           BAL   R14,ERRD1         'DEV DDD'              ELI22420
1E5E  4810 2006          2243           LH    R1,EXPDEV                                ELI22430
1E62  2403               2244           LIS   R0,3                                     ELI22440
1E64  C820 18EA          2245           LHI   R2,ASCEXP                                ELI22450
1E68  41F0 1190          2246           BAL   R15,HEXASC                               ELI22460
1E6C  C850 18E6          2247           LHI   R5,ASCMSG                                ELI22470
1E70  41F0 11F0          2248           BAL   R15,PRINT         'EXP DDD'              ELI22480
1E74  4300 1F1A          2249           B     TSTENDX                                  ELI22490
                         2250  *                                                       ELI22500
1E78  C8F0 0E5E          2251  TT06X    LHI   R15,TSTEND        SPVSR RETURN           ELI22510
      0000 1E7C          2252  TT06     EQU   *                 INTERRUPT AFTER LINE RESET ELI22520
1E7C  40F0 1F56          2253           STH   R15,LINKSAV                              ELI22530
1E80  40F0 174E          2254           STH   R15,ISITERR                              ELI22540
1E84  C800 3036          2255           LHI   R0,C'06'                                 ELI22550
1E88  4000 179A          2256           STH   R0,ERRNO                                 ELI22560
1E8C  41E0 102A          2257           BAL   R14,ERR1          'ERROR TT06'           ELI22570
1E90  4800 1720          2258           LH    R0,INTDEV                                ELI22580
1E94  4000 1720          2259           STH   R0,ERRDEV                                ELI22590
1E98  41E0 1034          2260           BAL   R14,ERRD1         'DEV DDD'              ELI22600
1E9C  4810 2006          2261           LH    R1,EXPDEV                                ELI22610
1EA0  2403               2262           LIS   R0,3                                     ELI22620
1EA2  C820 18F6          2263           LHI   R2,ASCRST                                ELI22630
1EA6  41F0 1190          2264           BAL   R15,HEXASC                               ELI22640
1EAA  C850 18F0          2265           LHI   R5,RSTMSG                                ELI22650
1EAE  41F0 11F0          2266           BAL   R15,PRINT         'RESET DDD'            ELI22660
1EB2  4300 1F1A          2267           B     TSTENDX                                  ELI22670
                         2268  *                                                       ELI22680
1EB6  C8F0 0E5E          2269  TT07X    LHI   R15,TSTEND        SPVSR RETURN           ELI22690
      0000 1EBA          2270  TT07     EQU   *                 NO INTERRUPT FROM EXTERNAL LINE ELI22700
1EBA  40F0 1F56          2271           STH   R15,LINKSAV                              ELI22710
1EBE  40F0 174E          2272           STH   R15,ISITERR       FORCE ERROR PRINT      ELI22720
1EC2  C800 3037          2273           LHI   R0,C'07'                                 ELI22730
1EC6  4000 179A          2274           STH   R0,ERRNO                                 ELI22740
1ECA  41E0 102A          2275           BAL   R14,ERR1          'ERROR TT07'           ELI22750
1ECE  4300 1F1A          2276           B     TSTENDX                                  ELI22760
                         2277  *                                                       ELI22770
                         2278  *                                                       ELI22780
1ED2  C8F0 0E5E          2279  TT08X    LHI   R15,TSTEND        SPVSR RETURN           ELI22790
      0000 1ED6          2280  TT08     EQU   *                 MULTIPLE INTERRUPTS    ELI22800
1ED6  40F0 1F56          2281           STH   R15,LINKSAV                              ELI22810
1EDA  40F0 174E          2282           STH   R15,ISITERR                              ELI22820
1EDE  C800 3038          2283           LHI   R0,C'08'                                 ELI22830
1EE2  4000 179A          2284           STH   R0,ERRNO                                 ELI22840
1EE6  41E0 102A          2285           BAL   R14,ERR1          'ERROR TT08'           ELI22850
1EEA  4800 1720          2286           LH    R0,INTDEV         INTERRUPTING DEVICE    ELI22860
1EEE  4000 1720          2287           STH   R0,ERRDEV                                ELI22870
1EF2  41E0 1034          2288           BAL   R14,ERRD1         'DEV DDD'              ELI22880
1EF6  4300 1F1A          2289           B     TSTENDX                                  ELI22890
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                           2290  *                                                                     ELI22900
1EFA   C8F0 0E5E           2291  TT09X    LHI    R15,TSTEND                                            ELI22910
1EFE   40F0 1F56           2292  TT09     STH    R15,LINKSAV                                           ELI22920
1F02   40F0 174E           2293           STH    R15,ISITERR                                           ELI22930
1F06   C800 3039           2294           LHI    R0,C'09'                                              ELI22940
1F0A   4000 179A           2295           STH    R0,ERRNO                                              ELI22950
                           2296  *                                                                     ELI22960
1F0E   41E0 102A           2297           BAL    R14,ERR1                                              ELI22970
1F12   4020 1720           2298           STH    R2,ERRDEV                                             ELI22980
1F16   41E0 1034           2299           BAL    R14,ERRD1                                             ELI22990
       0000 1F1A           2300  TSTENDX  EQU    *                   COMMAND ADDRESS PRINT & RETURN    ELI23000
1F1A   4800 175A           2301           LH     R0,TOTERR                                             ELI23010
1F1E   2601                2302           AIS    R0,1                                                  ELI23020
1F20   4000 175A           2303           STH    R0,TOTERR                                             ELI23030
                           2304  *                                                                     ELI23040
1F24   4810 2010           2305           LH     R1,CMDADR                                             ELI23050
1F28   2403                2306           LIS    R0,3                                                  ELI23060
1F2A   4000 174E           2307           STH    R0,ISITERR          FORCE ERROR PRINT                 ELI23070
1F2E   4000 1750           2308           STH    R0,NOERR            SUPRESS THAT PRINT.               ELI23080
1F32   C820 18E0           2309           LHI    R2,ASCADR                                             ELI23090
1F36   41F0 1190           2310           BAL    R15,HEXASC                                            ELI23100
1F3A   C850 18D8           2311           LHI    R5,CMDMSG                                             ELI23110
1F3E   41F0 11F0           2312           BAL    R15,PRINT           'CMD ADR DDD'                     ELI23120
1F42   41F0 1274           2313           BAL    R15,CRLF                                              ELI23130
1F46   2400                2314           LIS    R0,0                                                  ELI23140
1F48   4000 174E           2315           STH    R0,ISITERR          CLEAR ERROR FLAG                  ELI23150
1F4C   41F0 1358           2316           BAL    LINK,TSTBRK                                           ELI23160
1F50   48F0 1F56           2317           LH     R15,LINKSAV                                           ELI23170
1F54   030F                2318           BR     R15                                                   ELI23180
                           2319  *                                                                     ELI23190
1F56   0000                2320  LINKSAV  DCX    0                   RETURN ADDRESS                    ELI23200


                           2322  * SUBROUTINE DELAY  - SOFTWARE INTERRUPT TIMEOUT.                      ELI23220
                           2323  * CALLING SEQUENCE:                                                   ELI23230
                           2324  *        BAL    LINK,DELAY                                            ELI23240
                           2325  *                                                                     ELI23250
1F58   4850 1852           2326  DELAY    LH     R5,TIMVAL+6         SPECIFIED VALUE                   ELI23260
1F5C   4330 1F6A           2327           BZ     DLY.2               ZERO = NO DELAY                   ELI23270
1F60   4870 0A26           2328           LH     R7,PSW3             COMMON PSW3 USED IN I/O TEST      ELI23280
1F64   9567                2329           EPSR   R6,R7                                                 ELI23290
       0000 1F66           2330  DLY.0    EQU    *                                                     ELI23300
1F66   2751                2331           SIS    R5,1                                                  ELI23310
1F68   2031                2332           BNZS   DLY.0                                                 ELI23320
1F6A   4870 0A24           2333  DLY.2    LH     R7,PSW2             ELI                               ELI23330
1F6E   9567                2334           EPSR   R6,R7               DISABLE EXTR. INTPTS              ELI23340
1F70   030F                2335           BR     LINK                                                  ELI23350
                           2336  *                                                                     ELI23360
                           2337  * SUBROUTINE WALKIT - 'WALKS' SELECTED LINE ACROSS MODULE.            ELI23370
                           2338  * CALLING SEQUENCE:                                                   ELI23380
                           2339  *        STH    R8,PATSAV           INITIAL BIT PATTERN               ELI23390
                           2340  *        LHI    R9,VECTOR          FOR SELECTED LINE                  ELI23400
                           2341  *        LHI    R14,EXIT ADDRESS   (TAKEN IF ALL BITS 0 OR 1 TOGETHER) FLI23410
                           2342  *        BAL    R15,WALKIT                                            ELI23420
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                        2343  *                                                                    ELI23430
1F72  C860 193A         2344  WALKIT  LHI   R6,DEVINT+16       NTPT HDLR TABLE                    ELI23440
1F76  4880 1FB8         2345          LH    R8,PATSAV                                            ELI23450
1F7A  CE80 0001         2346          SRHA  R8,1                                                 ELI23460
1F7E  4080 1FBA         2347          STH   R8,PATSAV           UPDATED PATTERN                    ELI23470
1F82  0878              2348          LHR   R7,R8               COPY CURRENT PATTERN               ELI23480
1F84  2762              2349  WALK.1  SIS   R6,2                                                   ELI23490
1F86  CE70 0001         2350          SRHA  R7,1                                                 ELI23500
1F8A  2186              2351          BCS   WALK.2                                               ELI23510
1F8C  033E              2352          BZR   R14                 ZERO RESULT - EXIT               ELI23520
1F8E  C570 FFFF         2353          CLHI  R7,-1               ALL BITS SET ?                   ELI23530
1F92  033E              2354          BER   R14                 YES. EXIT.                       ELI23540
1F94  2208              2355          BS    WALK.1                                               ELI23550
1F96  4096 0000         2356  WALK.2  STH   R9,0(R6)           CURRENT VECTOR                   ELI23560
1F9A  4060 1FB6         2357          STH   R6,WALKSV           POINTER TO VECTOR                ELI23570
1F9E  2401              2358          LIS   R0,1                                                 ELI23580
1FA0  DE00 200E         2359          OC    R0,DISINC                                            ELI23590
1FA4  DA00 1FB9         2360          WD    R0,PATSAV+1                                          ELI23600
1FA8  DA00 200C         2361          WD    R0,ZERO                                              ELI23610
1FAC  D800 200C         2362          WH    R0,ZERO                                              ELI23620
1FB0  DE00 200F         2363          OC    R0,DISNORM                                           ELI23630
1FB4  030F              2364          BR    R15                 RETURN                           ELI23640
                        2365  *                                                                    ELI23650
1FB6  0000              2366  WALKSV  DCX   0                   POINTER TO CURRENT VECTOR        ELI23660
1FB8  0000              2367  PATSAV  DCX   0                   UPDATED PATTERN                  ELI23670
                        2368  *                                                                    ELI23680
                        2369  *  ********************************************************************ELI23690
                        2370  *                                                                    ELI23700
      0000 1FBA         2371  INIT    EQU   *                   TO SET UP BASIC TABLES, ETC.     ELI23710
                        2372  *                                                                    ELI23720
1FBA  C810 1910         2373          LHI   R1,DEVSADR          SET UP DEVSADR TABLE ***         ELI23730
1FBE  4800 185E         2374          LH    R0,DEVADR+6         LINE 0 ADDRESS                   ELI23740
1FC2  C400 0FFF         2375          NHI   R0,X'0FFF'                                           ELI23750
1FC6  0820              2376          LHR   R2,R0               SAVE COPY                        ELI23760
1FC8  4001 0000         2377  INIT.1  STH   R0,0(R1)            EIGHT CONSECUTIVE DVADR'S        ELI23770
1FCC  2601              2378          AIS   R0,1                                                 ELI23780
1FCE  2612              2379          AIS   R1,2                                                 ELI23790
1FD0  C502 0008         2380          CLHI  R0,8(R2)                                             ELI23800
1FD4  2086              2381          BLS   INIT.1                                               ELI23810
                        2382  *                                                                    ELI23820
1FD6  C810 1922         2383          LHI   R1,INTLVL           SET UP INTLVL TABLE ***          ELI23830
1FDA  0821              2384          LHR   R2,R1                                                ELI23840
1FDC  4800 1846         2385          LH    R0,INTLEV+6         LINE 0 ADDRESS, INTLEV           ELI23850
1FE0  C400 000F         2386          NHI   R0,15               EXTRACT INTLVL INFO              ELI23860
1FE4  0202 0000         2387  INIT.2  STB   R0,0(R2)                                             ELI23870
1FE8  2621              2388          AIS   R2,1                                                 ELI23880
1FEA  C521 0008         2389          CLHI  R2,8(R1)                                             ELI23890
1FEE  2085              2390          BLS   INIT.2                                               ELI23900
                        2391  *                                                                    ELI23910
1FF0  C810 192A         2392          LHI   R1,DEVINT           SET UP DEVINT TABLE ***          ELI23920
1FF4  2400              2393          LIS   R0,0                NO INTERRUPTS EXPECTED           ELI23930
1FF6  0821              2394          LHR   R2,R1                                                ELI23940
1FF8  4002 0000         2395  INIT.3  STH   R0,0(R2)                                             ELI23950
1FFC  2622              2396          AIS   R2,2                                                 ELI23960
1FFE  C521 0010         2397          CLHI  R2,16(R1)                                            ELI23970
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2002  2085                2398           BLS   INIT,3                                          ELI23980
2004  030F                2399           BR    LINK                 RETURN                     ELI23990
                          2400  *                                                               ELI24000
                          2401  *  ************************************************************ ELI24010
                          2402  * DEVICE COMMAND AND DATA BYTES                                 ELI24020
                          2403  *                                                               ELI24030
2006  0000                2404  EXPDEV  DCX   0                    LINE EXPECTED TO INTERRUPT  ELI24040
2008  0000                2405  RST     DCX   0                    LINE LAST RESET             ELI24050
200A  0000                2406  INTCNT  DCX   0                                                ELI24060
200C  0000                2407  ZERO    DCX   0                                                ELI24070
200E  4080                2408  DISINC  DCX   4080                                             ELI24080
      0000 200F           2409  DISNORM EQU   *-1                                              ELI24090
2010  0000                2410  CMDADR  DCX   0                    COMMAND ADDRESS LAST USED   ELI24100
2012  6040                2411  ENRT    DC    X'6040'              ENABLE,RESET                ELI24110
      0000 2013           2412  ENMK    EQU   ENRT+1               ENB,MASK                    ELI24120
2014  FF50                2413  ALLI    DC    X'FF50'                                          ELI24130
      0000 2015           2414  ENST    EQU   ALLI+1                                           ELI24140
2016  0880                2415  CLRI    DC    X'880'               CLEAR                       ELI24150
      0000 2017           2416  DSMK    EQU   CLRI+1               DIS,MASK                    ELI24160
2018  0000                2417  MSK     DCX   0                    E                           ELI24170
                          2418  *  ************************************************************ ELI24180
                          2419  *                                                               ELI24190
      0000 201A           2420  LNZB    EQU   *                                                ELI24200
                          2421  *                                                               ELI24210
                          2422  *--------------------------------                             ELI24220
                          2423  *  ALL TEST PROGRAM STORAGE AREA                               ELI24230
                          2424  *                                                               ELI24240
                          2425  *                                                               ELI24250
                          2426  *  START OF CHKSUM FILE                                        ELI24260
                          2427  *                                                               ELI24270
                          2428  *                                                               ELI24280
                          2429  *                                                               ELI24290
201A                      2430  OPTBUF  DS    6                    OPTION INPUT BUFFER         ELI24300
2020                      2431  IOSAVE  DS    2                                                ELI24310
2022                      2432  TEMP    DS    2                    TEMPORARY STORAGE LOC       ELI24320
2028                      2433          ALIGN 8                                                ELI24330
2028  0000 0000           2434  PSWSAVE DCY   0,0                  PPF PSW SAVE AREA           ELI24340
202C  0000 0000
2030                      2435  RSAVE   DS    128                  REGISTER SAVE AREA          ELI24350
20B0                      2436  INTSAV  DS    64                   REGISTERS ON EXT/IMM INTERRUPT ELI24360
20F0                      2437  ERRSAVE DS    64                   REG STORAGE FOR ERROR ROUTINES ELI24370
2130                      2438          DS    256                  REG SETS 4-F, 8/32 WITH 8 SETS ELI24380
2230                      2439          DS    64                   DOUBLE PRECISION FP REG SAVE AREA ELI24390
                          2440  *                                                               ELI24400
2270                      2441          ALIGN 8                                                ELI24410
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CHKSUM

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                        2444  *                                                                    ELI24440
                        2445  *       CHKSUM                                                       ELI24450
                        2446  *       (THE FOLLOWING CODE IS NOT PART OF THE TEST.)                ELI24460
                        2447  *                                                                    ELI24470
                        2448  *                                                                    ELI24480
2270  2400              2449  $CHKSUM LIS   R0,0          PUNCH M17 TAPE WITH CHECKSUM             ELI24490
2272  9510              2450        EPSR  R1,R0           SELECT REG. SET 0                        ELI24500
                        2451  *                                                                    ELI24510
2274  C810 0A00         2452        LDAI  R1,ORIGIN1      START                                    ELI24520
2278  2421              2453        LIS   R2,1            INCREMENT                                ELI24530
227A  C830 201A         2454        LDAI  R3,LNZB         FINAL                                    ELI24540
227E  2440              2455        LIS   R4,0            CHECKSUM BYTE                            ELI24550
2280  D351 0000         2456  $GEN  LB    R5,0(R1)                                                 ELI24560
2284  0745              2457        XAR   R4,R5                                                    ELI24570
2286  C110 2280         2458        BXLE  R1,$GEN                                                  ELI24580
228A  D240 0099         2459        STB   R4,MN+3         CHECKSUM BYTE TO BOOT LOADER             ELI24590
                        2460  *                                                                    ELI24600
228E  C810 0080         2461  $TAPE LHI   R1,X'0080'                                             ELI24610
2292  9E21              2462        OCR   R2,R1           DISPLAY : NORMAL MODE                    ELI24620
2294  9444              2463        EXBR  R4,R4                                                    ELI24630
2296  9824              2464        WHR   R2,R4           CHECKSUM BYTE TO D1                      ELI24640
2298  9411              2465        EXBR  R1,R1                                                    ELI24650
229A  9501              2466        EPSR  R0,R1           HALT PROCESSOR.                          ELI24660

229C  D360 007A         2468  $PUNCH LB   R6,X'7A'        GET BOUTDV (PUNCH) ADDRESS.              ELI24680
22A0  DE60 007B         2469        OC    R6,X'7B'        START TAPE PUNCH                         ELI24690
22A4  9D60              2470        SSR   R6,R0                                                    ELI24700
22A6  2081              2471        BTBS  8,1                                                      ELI24710
22A8  41F0 22EA         2472        BAL   R15,$TAPL       PUNCH LEADER                             ELI24720
22AC  9411              2473        EXBR  R1,R1           (R1) = X'0080'                           ELI24730
22AE  C830 00CF         2474        LHI   R3,X'CF'                                                 ELI24740
22B2  DA61 0000         2475  $PNCH1 WD   R6,0(R1)        PUNCH BOOT LOADER                        ELI24750
22B6  9D60              2476        SSR   R6,R0                                                    ELI24760
22B8  2081              2477        BTBS  8,1                                                      ELI24770
22BA  C110 22B2         2478        BXLE  R1,$PNCH1                                                ELI24780
22BE  41F0 22F0         2479        BAL   R15,$TAPL1      PUNCH ONE-FOLD GAP.                      ELI24790
                        2480  *                                                                    ELI24800
22C2  D340 0099         2481        LB    R4,MN+3         GET CHECKSUM BYTE                        ELI24810
22C6  C810 0A00         2482        LDAI  R1,ORIGIN1      (NORMALLY X'A00')                        ELI24820
22CA  C830 201A         2483        LDAI  R3,LNZB                                                  ELI24830
22CE  D351 0000         2484  $PNCH2 LB   R5,0(R1)        PUNCH PROGRAM                            ELI24840
22D2  0745              2485        XAR   R4,R5                                                    ELI24850
22D4  9A65              2486        WDR   R6,R5                                                    ELI24860
22D6  9401              2487        EXBR  R0,R1                                                    ELI24870
22D8  9820              2488        WHR   R2,R0           DATA ADDRESS TO DISPLAY.                 ELI24880
22DA  9D60              2489        SSR   R6,R0                                                    ELI24890
22DC  2081              2490        BTBS  8,1                                                      ELI24900
22DE  C110 22CE         2491        BXLE  R1,$PNCH2                                                ELI24910
22E2  41F0 22EA         2492        BAL   R15,$TAPL       PUNCH TRAILER.                           ELI24920
22E6  4300 228E         2493        B     $TAPE           DISPLAY CHECKSUM, HALT PROCESSOR.        ELI24930
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CHKSUM

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22EA   C800 0100          2495  $TAPL    LHI   R0,256      TO PUNCH BLANK LEADER          ELI24950
22EE   2303               2496           BS    $TAPLP                                     ELI24960
22F0   C800 0080          2497  $TAPL1   LHI   R0,128      TO PUNCH 1-FOLD GAP            ELI24970
22F4   2701               2498  $TAPLP   SIS   R0,1                                       ELI24980
22F6   032F               2499           BNPR  R15           RETURN                         ELI24990
22F8   2430               2500           LIS   R3,0                                       ELI25000
22FA   9A63               2501           WDR   R6,R3         PUNCH BLANK FRAME              ELI25010
22FC   9D68               2502           SSR   R6,R8                                      ELI25020
22FE   2081               2503           BTBS  8,1                                        ELI25030
2300   22D6               2504           BS    $TAPLP        CONTINUE.                      ELI25040
                          2505  *                                                          ELI25050
2302                      2506           END                                              ELI25060
```

CHKSUM

ASSEMBLED BY CAL V3-066R05-00 (32-BIT)

START OPTIONS: T=16,CROSS,ERLST,

NO CAL ERRORS
NO CAL WARNINGS
2 PASSES

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$CHKSUM   0000 2270   2449*
$DEC1     0000 11C2    879*   893
$DEC2     0000 11C8    881*   886    888
$DEC3     0000 11DA    882    889*
$GEN      0000 2280   2456*  2458
$NULL     0000 1762   1479*
$PNCH1    0000 22B2   2475*  2478
$PNCH2    0000 22CE   2484*  2491
$PUNCH    0000 229C   2468*
$TAPE     0000 228E   2461*  2493
$TAPL     0000 22EA   2472   2492   2495*
$TAPL1    0000 22F0   2479   2497*
$TAPLP    0000 22F4   2496   2498*  2504
$TIMER1   0000 1114    804*   809   1304
$TIMXT    0000 1128    811*  1306
$TSTDU0   0000 13D2   1074   1076*
$TSTDU1   0000 13F0   1086*
$TSTDU2   0000 13F2   1083   1085   1087*
ABORT     0000 0E96    568*
ABORT2    0000 0ED8    577    589*
ABSTOP    0000 2302
ADC       0000 0002    117    160    175    428    878    892   1155   1227   1240   1252   1264   1272   1293
                      1338   1352   1358   1377   1392   1403
ADR       0000 0CE2    400*
AF        0000 167C   1151   1356*
ALLI      0000 2014   1633   1636   1711   1713   1719   1781   1886   1988   1990   2112   2413*  2414
AMSG      0000 180E    234   1512*
ASCADR    0000 18E0   1551*  2309
ASCEXP    0000 18EA   1553*  2245
ASCIOEV   0000 17BC    734   1499*  2169
ASCIOEV2  0000 17CC    714   1503*
ASCILOC   0000 17E0    748    761   1507*
ASCIPSW   0000 17D6    758   1505*
ASCISTA   0000 17C4    724    738   1501*  2173
ASCMSG    0000 18E6   1552*  2247
ASCRST    0000 18F6   1555*  2263
BOOT      0000 0088     84     87*
BRK.SAV   0000 1768   1035   1063   1067   1482*
BRKVECT   0000 174C   1061   1065   1468*
BTESTNO   0000 175C    506    524    541    562    595   1476*
C300ADR   0000 0A18    134*
CAR2ND    0000 1740   1456*
CARRD     0000 1734   1448*
CARRQ2S   0000 1748   1463*
CLIF2ND   0000 173C   1454*
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CHKSUM

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			2275	2285	2297									
ERRALL	0000	0FDE	675*	1318	1328									
ERRCOM	0000	0FF6	646	655	660	665	671	676	684*					
ERRCOM1	0000	1014	688	694*										
ERRCOM2	0000	0F78	648*	658	663	668	674	680						
ERRD	0000	0F8A	654*											
ERRD1	0000	1034	657	712*	2191	2203	2215	2230	2242	2260	2288	2299		
ERRDEV	0000	1720	713	733	1429*	2190	2202	2214	2229	2241	2259	2287	2298	
ERRDS	0000	0FB2	664*											
ERRDS1	0000	1064	667	678	732*									
ERRL	0000	0FC6	669*											
ERRL1	0000	108A	673	746*										
ERRLVL	0000	17FB	1327	1509*										
ERRMSG	0000	1792	705	1493*	1494	1495								
ERRNO	0000	179A	500	1317	1325	1348	1357	1376	1389	1495*	2187	2199	2211	2223	2238
			2256	2274	2284	2295								
ERRPL1	0000	10A2	679	756*	1370									
ERRS	0000	0F9E	659*											
ERRS1	0000	104C	662	722*										
ERRSAVE	0000	20F0	645	652	654	659	664	669	675	2166	2177	2437*		
ERRSTA	0000	1722	723	737	1431*									
ETESTNO	0000	1798	499	532	1494*									
EXPDEV	0000	2006	1825	2030	2047	2243	2261	2404*						
FIRST	0000	1710	315	322	326	1418*								
FOUND1	0000	0DAC	472	482*										
FOUND2	0000	0DB0	478	483*										
FP	0000	166A	1162	1341*										
GETCHR	0000	1310	244	368	770	779	1004*							
HALT9	0000	0EFC	594	600*	607	699								
HDLR0	0000	192A	1574*											
HDLR1	0000	192C	1575*											
HDLR2	0000	192E	1576*											
HDLR3	0000	1930	1577*											
HDLR4	0000	1932	1578*											
HDLR5	0000	1934	1579*											
HDLR6	0000	1936	1580*											
HDLR7	0000	1938	1581*											
HEXASC	0000	1190	530	715	725	735	739	749	759	762	857*	2170	2174	2246	2264
			2310											
HEXASC1	0000	119A	861*	868										
HEXTAB	0000	1778	332	772	824	864	889	1326	1487*					
II	0000	16B0	1147	1375*										
II32	0000	16C6	1379	1383*										
IMPTOP	0000	0000R												
INCR	0000	1725	629	1434*										
INIT	0000	1FBA	487	2371*										
INIT.1	0000	1FC8	2377*	2381										
INIT.2	0000	1FE4	2387*	2390										
INIT.3	0000	1FF8	2395*	2398										
INITRET	0000	0DC4	492*											
INTCNT	0000	200A	1638	1651	1653	1708	1733	1735	1798	1871	1929	1931	1996	2033	2035
			2091	2150	2152	2406*								
INTDEV	0000	1720	1225	1262	1279	1428*	1429	1822	1824	1922	2028	2127	2168	2189	2201

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                                2213   2240   2258   2286
INTLEV      0000 1940           1523*  2385
INTLVL      0000 1922           1300   1570*  2383
INTLVLM     0000 17E6           1330   1508*  1509
INTPSW      0000 1714           1261   1280   1420*
INTSAV      0000 20B0           1243   1253   1278   1310   2436*
INTSTA      0000 1722           1226   1263   1430*  1431   2172
IO          0000 0A10            130*   179    180    188    189    195    201    361    484    994   1040   107A   1093
                                1126   1195
IO.OK1      0000 0A7A            183    185*
IO.OK2      0000 0A80            186    188*
IO.OK3      0000 0A9E            193    198*
IO.OK4      0000 0AD6            213    216*
IOSAVE      0000 2020            299    485    934    957    992   1076   1096   1124   2431*
ISITERR     0000 174E            493    612    649    689    924   1025   1029   1331   1369  1469*  2185   2197   2209
                                2221   2236   2254   2272   2282   2293   2307   2315
KBINT       0000 174A           1235   1467*
KBINT0      0000 1506           1180   1193*  1256
KBINT00     0000 1544           1213*  1217
KBINT0A     0000 1548           1207   1214*
KBINT0B     0000 1532           1197   1206*
KBINT0C     0000 1522           1201*  1204
KBINT1      0000 1552           1194   1218*
KBINT2      0000 157E           1229   1233*
KBINT3      0000 1568           1213   1219   1225*
KBRD        0000 1426           1112*
KBRD1       0000 1438           1115   1117*
KBREAD      0000 140A           1004   1101*
KBXIT       0000 1424           1106   1108*
KEEP1       0000 0D94            471*   474
KEEP10      0000 0F0A            574    608*   921
KEEP101     0000 0F30            619*   621
KEEP2       0000 0DA2            477*   480
KEEP3       0000 0DEA            505*   598
KEEP4       0000 0DF4            511*   564    597
KEEP41      0000 0DF8            512*   523
KEEP42      0000 0E0E            516    520*
KEEP43      0000 0E14            519    522*
KEEP5       0000 0E18            518    521    524*
KEEP6       0000 0E4C            539*   557
KEEP7       0000 0E7C            555    558*
KEEP71      0000 0E8A            559    562*
KEEP9       0000 0ED4            572    586*
KEEP91      0000 0EE2            592*   698
KEEP92      0000 0F04            582    606*
LADC        0000 0001            542    877
LCORE       0000 145A            219    501   1133*
LCORE32     0000 14CE           1157   1173*
LCORE32A    0000 14F6           1184*  1189
LDWT        0000 00C8            110*   113
LEADER      0000 00A2             94*    98
LEVEL       0000 0CEA            404*   152
LINE0       0000 1910           1560*
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OPTCMD1    0000 0BD8    307*   311
OPTCMD10   0000 0C60    351*   355
OPTCMD11   0000 0C92    368*   372
OPTCMD12   0000 0CA0    365    366    373*
OPTCMD2    0000 0BFA    317*   345
OPTCMD3    0000 0C00    319*   338
OPTCMD4    0000 0C06    321*
OPTCMD5    0000 0C18    323    326*
OPTCMD6    0000 0C28    328    331*
OPTCMD7    0000 0C34    320    334*
OPTCMD71   0000 0C46    339*
OPTCMD8    0000 0C54    304    347*
OPTCMD9    0000 0C5E    350*   377
OPTEND2    0000 1864    376   1529*
OPTEXX     0000 0BC4    293    296    300*
OPTIN      0000 0AF6    229*   249    370    394    442    462    583    625   1062
OPTIN1     0000 0AFA    231*   378   1030   1320   1333   1371
OPTION     0000 1864    287    300   1531*
OPTRTN     0000 0BCA    303*
OPTVAL     0000 10C6    294    386    447    769*
OPTVAL0    0000 10CC    771*   789
OPTVAL1    0000 10CE    772*   775
OPTVAL2    0000 10DA    773    777*
OPTVAL3    0000 10DE    779*   785
OPTVAL4    0000 10F2    783    786*
OPTVAL5    0000 10EE    781    784*
ORIGIN1    0000 0A00     87    116*   2452   2482
ORIGIN2    0000 0A04    118*
ORIGIN3    0000 0A08    119*
ORIGIN4    0000 0A0C    120*
OTC.0      0000 1294    961*   966    975    977
OTC.1      0000 12A0    965*
OTC.2      0000 12AA    964    968*
OTC.3      0000 12BC    971    974*
OTC.4      0000 12DA    983*   988
OTC.5      0000 12F0    990*   996
OUT.SAV    0000 1766    956    999   1481*
OUT0       0000 1306    962    981    984    986    991    998*
OUT1       0000 130A    997    999*
OUTCHR     0000 1282    235    237    298    308    313    325    330    333    352    357    619    825    844
                        852    918    928    937    941    952    956*
OUTCHR2    0000 12CA    959    967    973    979*
P1         0000 1202    901    904*
P2         0000 1228    918*   920
P3         0000 1234    905    922*
PASFLG     0000 1726    210   1048   1104   1114   1206   1436*
PASFLG2    0000 1728    191   1073   1437*
PASLADR    0000 0A12    131*
PATSAV     0000 1F88   1777   1802   1869   1888   1973   1992   2131   2135   2140   2345   2347   2360   2367*
PAUSE      0000 1764    960    965    972    976    979   1480*
PRINT      0000 11F0    225    535    561    580    613    706    717    727    741    751    764    899*  1027
                       1332   2115   2148   2176   2248   2266   2312
PRINT2     0000 1242    923    927*   932
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			2261	2305	2373	2377	2379	2383	2384	2389	2392	2394	2397	2450	2452
			2456	2458	2461	2462	2465	2465	2466	2473	2473	2475	2478	2482	2484
			2487	2491											
R10		0000 000A	70*	1260	1260	1261	1280	1298	1299	1300	1326	1326	1327	1387	1387
			1399	1400											
R11		0000 000B	71*												
R12		0000 000C	72*	238	255	264	275	385	388	398	402	406	421	449	481
			776												
R13		0000 000D	73*												
R14		0000 000E	74*	294	304	340	386	389	391	447	452	456	787	790	796
			1341	1361	1364	1380	1390	1395	1398	1400	1401	1792	1881	1983	2133
			2188	2191	2200	2203	2212	2215	2224	2230	2239	2242	2257	2260	2275
			2285	2288	2297	2299	2352	2354							
R15		0000 000F	76*	217	225	244	391	397	401	405	466	467	468	670	770
			771	772	774	778	779	825	852	956	999	1000	1061	1063	1342
			1362	1365	1381	1391	1396	1402	1650	1732	1794	1805	1826	1882	1890
			1928	1984	1998	2031	2033	2034	2035	2036	2048	2115	2123	2158	2182
			2184	2185	2194	2196	2197	2206	2208	2209	2218	2220	2221	2233	2235
			2236	2246	2248	2251	2253	2254	2264	2266	2269	2271	2272	2279	2281
			2282	2291	2292	2293	2310	2312	2313	2317	2318	2364	2472	2479	2492
			2499												
R2		0000 0002	62*	83	103	109	158	159	161	162	168	170	180	185	187
			189	190	194	195	196	203	204	205	206	214	214	215	231
			232	300	301	306	307	309	310	316	319	341	349	351	353
			358	375	376	415	417	427	511	514	515	522	524	525	526
			527	529	531	532	541	542	543	602	646	650	651	655	660
			665	671	676	684	689	690	691	692	714	724	734	738	748
			758	761	805	817	818	820	822	826	865	866	890	891	904
			1040	1041	1043	1048	1052	1055	1055	1134	1184	1186	1186	1187	1198
			1199	1201	1202	1208	1209	1214	1220	1221	1223	1225	1233	1254	1255
			1262	1276	1277	1279	1285	1347	1348	1356	1357	1359	1367	1375	1376
			1378	1388	1389	1393	1410	1623	1624	1625	1626	1629	1630	1631	1633
			1634	1635	1636	1643	1644	1645	1699	1700	1701	1702	1705	1706	1710
			1711	1712	1713	1716	1717	1718	1719	1724	1725	1726	1773	1775	1779
			1780	1781	1782	1786	1787	1788	1789	1799	1800	1801	1802	1809	1810
			1811	1865	1867	1884	1885	1886	1887	1888	1898	1899	1900	1969	1971
			1986	1987	1988	1989	1990	1991	1993	2004	2005	2006	2095	2096	2097
			2098	2101	2102	2105	2106	2107	2108	2110	2111	2112	2138	2139	2140
			2141	2142	2169	2173	2245	2263	2298	2309	2376	2380	2384	2387	2388
			2389	2394	2395	2396	2397	2453	2462	2464	2488				
R3		0000 0003	63*	88	89	90	181	182	185	201	202	211	211	215	216
			217	272	276	280	282	303	316	341	350	354	416	417	419
			420	423	453	457	617	620	794	797	797	806	835	837	845
			849	858	859	860	862	867	876	877	878	880	892	917	919
			1135	114	1144	1147	1148	1151	1152	1162	1163	1176	1177	1183	1187
			1193	1199	1202	1203	1209	1214	1215	1221	1226	1254	1263	2454	2474
			2483	2500	2501										
R4		0000 0004	64*	92	93	94	96	104	106	208	209	210	212	212	234
			236	245	247	248	250	252	259	261	265	292	297	307	312
			317	318	321	324	329	331	332	332	334	335	336	337	351
			356	369	371	384	387	436	458	618	772	780	782	786	788
			821	822	823	824	824	840	843	851	861	862	863	864	864
			865	879	884	885	887	889	889	890	913	914	915	916	927

CHKSUM

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SINK        0000 1723      1016   1079   1088   1103   1432*
ST          0000 0452       163    168*
STAMSG      0000 17C0       726   1500*
START       0000 0A6A       168    179*
START1      0000 0A32       116    156*   174
START2      0000 0A48       118    164*   176
START3      0000 0A62       119    174*
START4      0000 0A66       120    176*
T0END       0000 198C      1648*  1656
T0INT       0000 1990      1622   1650*
T1END       0000 1A08      1729*  1738
T1INT       0000 1A0C      1698   1731*
T2END       0000 1AD0      1813   1830*
T2INT       0000 1AA0      1793   1815*
T2INT.1     0000 1AC8      1823   1827*
T3END       0000 1B40      1903*  1934
T3INT       0000 1B44      1880   1908*  1911
T3INT.1     0000 1B48      1910*  1915
T3INT.2     0000 1B5C      1912   1917*
T3INT.3     0000 1B74      1925*  1933
T3INT.4     0000 1B7C      1873   1923   1928*
T4END       0000 1C0C      2009*
T4INT       0000 1C10      1975   2014*  2017
T4INT.1     0000 1C14      2016*  2021
T4INT.2     0000 1C28      2018   2023*
T4INT.3     0000 1C48      2029   2033*  2049
T4INT.4     0000 1C62      1982   2041*
T5END       0000 1054      2155*
T5ERR       0000 1058      2132   2158*
T5INT       0000 1060      2094   2161*
TEMP        0000 2022       318    321    331    334    336   2432*
TEST        0000 1810       303    380    439    441    460    461    470    476    517    520   1519*
TEST0       0000 193A      1540   1619*
TEST1       0000 19AA      1541   1695*
TEST2       0000 1A26      1542   1772*
TEST3       0000 1AD4      1543   1864*
TEST4       0000 1B96      1544   1968*
TEST5       0000 1C84      1545   2088*
TESTOP      0000 0D2E       381    436*
TESTS       0000 1884       543   1539*
TIME        0000 0A1E       144*   806
TIMER       0000 1110       803*  2120
TIMVAL      0000 184C      1524*  2326
TITLE       0000 1890       224   1547*
TOTAL       0000 1758       494    589    591    592    615   1474*
TOTERR      0000 175A       495    623    694    696   1475*  2301   2303
TOTMSG      0000 179E       611   1496*
TST0.0      0000 1944      1624*  1627
TST0.1      0000 1954      1650*  1646
TST0.2      0000 1976      1640*  1655
TST1.0      0000 19B4      1700*  1705
TST1.1      0000 19C4      1706*  1727
TST1.2      0000 19F2      1720*  1737
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CHKSUM

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TST2.0     0000 1A2A      1775*  1812
TST2.05    0000 1A36      1779*  1806
TST2.1     0000 1A46      1784*  1828
TST2.2     0000 1A50      1787*  1790
TST2.4     0000 1A8A      1792   1808*
TST3.0     0000 1AD8      1867*  1901
TST3.1     0000 1AEA      1873*  1891   1926
TST3.2     0000 1AF2      1875*  1878
TST3.3     0000 1AFE      1880*
TST3.4     0000 1B0A      1884*
TST3.5     0000 1B2A      1881   1894*
TST4.0     0000 1B9A      1971*  2007
TST4.1     0000 1BA6      1975*  1999   2039
TST4.2     0000 1BAE      1977*  1980
TST4.3     0000 1BBA      1982*
TST4.4     0000 1BC6      1986*
TST4.5     0000 1BEA      1997*  2037
TST4.6     0000 1BF6      1983   2002*
TST5.0     0000 1C84      2090*
TST5.1     0000 1C8A      2093*  2133   2154
TST5.11    0000 1C94      2096*  2099
TST5.2     0000 1CA8      2104*
TST5.3     0000 1CEA      2127*  2158   2178
TST5.4     0000 1D42      2124   2146   2150*
TSTBRK     0000 1358       374    533    556    575    942   1034*  2122   2144   2316
TSTBRK1    0000 13A2      1049   1058*  1060
TSTBRK2    0000 13AA      1047   1057   1061*
TSTBRK3    0000 13B6      1039   1051   1056   1064*
TSTBRK4    0000 1388      1042   1048*
TSTBRK5    0000 1378      1043*  1046
TSTDU      0000 13C6       571    606    687    900    961    980    990   1072*
TSTEND     0000 0E5E       549*  1648   1729   1830   1904   2010   2156   2182   2194   2206   2218   2233   2251
                          2269   2279   2291
TSTENDX    0000 1F1A      2192   2204   2216   2231   2249   2267   2276   2289   2300*
TSTMSG     0000 1788       534   1491*  1492
TSTOP1     0000 0D46       437    444*
TSTOP2     0000 0D4E       447*   459
TSTOP3     0000 0D64       451    455*
TSTOP4     0000 0D6E       454    458*
TT01       0000 1D94      1650   2183*
TT01X      0000 1D90      1785   2182*
TT02       0000 1D8C      1732   2195*
TT02X      0000 1D88      2194*
TT03       0000 1DE4      1928   2159   2207*
TT03X      0000 1DE0      2206*
TT04       0000 1E0C      1805   1890   1998   2219*
TT04X      0000 1E08      2218*
TT05       0000 1E3E      2031   2234*
TT05X      0000 1E3A      2233*
TT06       0000 1E7C      1826   2048   2252*
TT06X      0000 1E78      2251*
TT07       0000 1EBA      2123   2270*
TT07X      0000 1EB6      2269*
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TT08	0000	1ED6	2280*									
TT08X	0000	1ED2	1816	1917	2023	2042	2279*					
TT09	0000	1EFE	2292*									
TT09X	0000	1EFA	1632	2291*								
TTYGET	0000	141E	1106*									
UNARY	0000	1102	452	456	794*							
UNARY1	0000	1104	795*	799								
WALK.1	0000	1F84	2349*	2355								
WALK.2	0000	1F96	2351	2356*								
WALKIT	0000	1F72	1794	1882	1984	2134	2344*					
WALKSV	0000	1F86	1815	2041	2225	2357	2366*					
WASOU	0000	1754	221	467	496	588	609	902	904	914	998	1472*
WASOU1	0000	1756	222	468	573	916	1473*					
XI1	0000	15E6	1283*	1288								
XI16	0000	159C	1166	1253*								
XI16A	0000	15E4	1274	1282*								
XI2	0000	15F6	1286	1289*								
XI3	0000	1618	1295	1303*								
XI32	0000	15AA	1143	1183	1260*							
XI32A	0000	15C6	1266	1270*								
XI4	0000	162E	1305	1307	1310*							
XI5	0000	1632	1309	1311*								
XIERR	0000	1636	1284	1290	1316*							
XIEXIT	0000	1634	1291	1312*								
ZERO	0000	200C	1717	2361	2362	2407*						
ZERO1	0000	1464	1137*	1138								
ZERO2	0000	1474	1141*	1142								
ZERO3	0000	1484	1145*	1146								
ZERONE	0000	0CDA	396*	1521	1522							