PDT-11/LSI-11

TRAPS TEST
CVKADC0

AH-8200C-MC

FICHE 1 OF 1

DEC 1978
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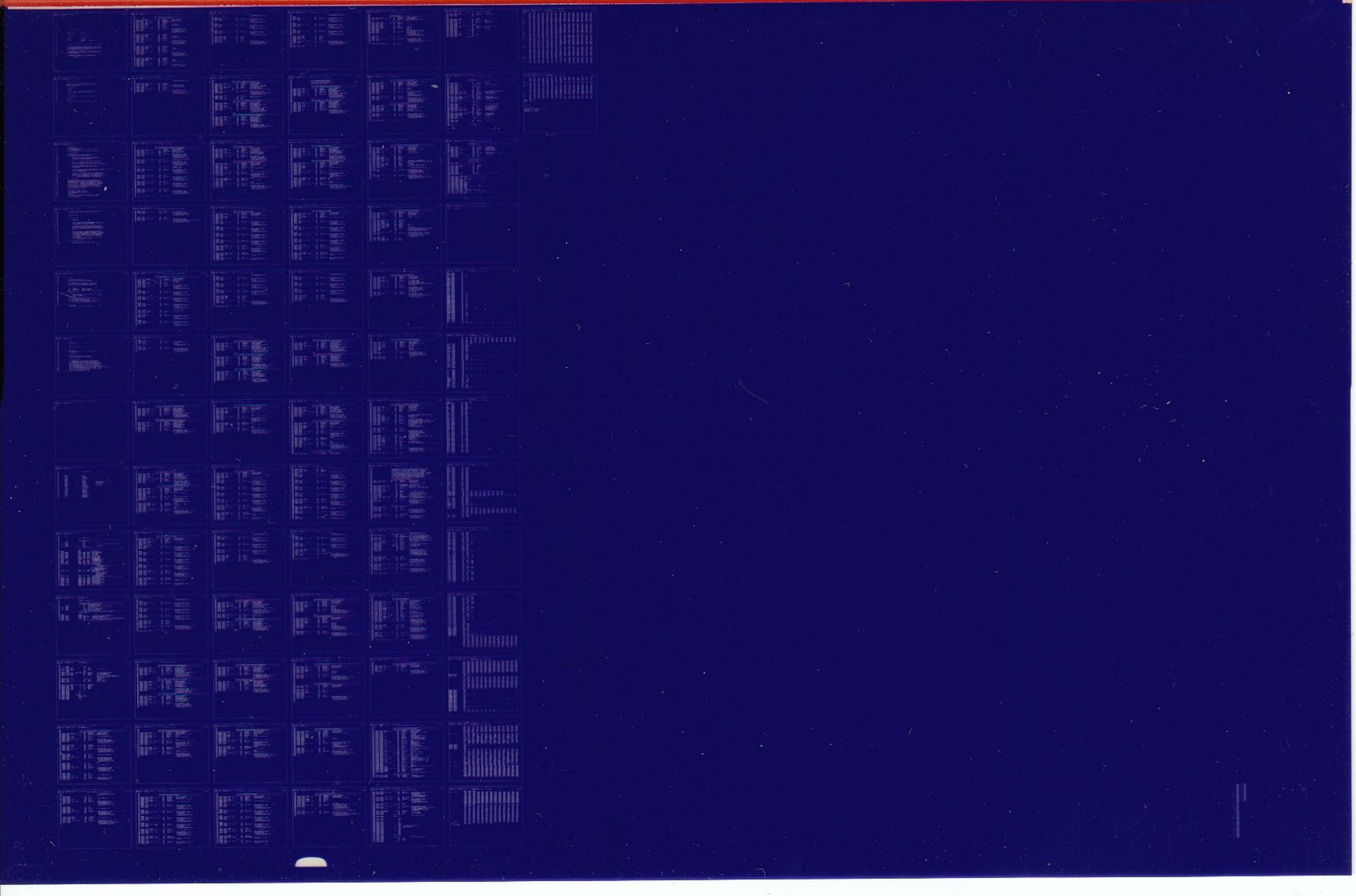
MADE IN USA



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     1          .REM    !
     2
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    12
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    15                        IDENTIFICATION
    16
    17
    18                  PRODUCT CODE:           AC-8198C-MC
    19
    20                  PRODUCT NAME:           CVKADC0 LSI-11 TRAPS TEST
    21
    22                  DATE CREATED:           AUG,  1978
    23
    24                  MAINTAINER:             DIAGNOSTIC GROUP
    25
    26                  AUTHOR:                 AL LOSCHAK
    27                  REVISED BY:             M. MCNALLY      JUNE 1976
    28                                          J. RICH         JULY 1978
    29
    30
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    32
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47
48          1.      ABSTRACT
49
50                  THIS IS A TEST OF ALL OPERATIONS AND INSTRUCTIONS THAT CAUSE
51                  TRAPS, ODDITIES OF REGISTER 6, INTERRUPTS, THE RESET
52                  AND WAIT INSTRUCTIONS.
53
54          2.      REQUIREMENTS
55
56          2.1     EQUIPMENT
57
58                  PDT-11 OR LSI-11 STANDARD COMPUTER WITH AN SLU UNIT
59                  AND 4K OF MEMORY.  THE CLOCK MUST BE DISABLED.
60
61          2.2     STORAGE
62
63                  2.2.1 PROGRAM STORAGE - THE ROUTINE USES 4K MEMORY
64
65          3.      LOADING PROCEDURE
66
67          3.1     METHOD
68
69                  PROCEDURE FOR NORMAL ABSOLUTE TAPES SHOULD BE FOLLOWED.
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                4.      SETUP PROCEDURE

                        THE PROGRAM STARTS AT 200.
                        IF IT IS DESIRED TO RESET THE PASS COUNT BACK TO ZERO
                        START AT LOCATION 210.
                        THE CLOCK MUST BE DISABLED FOR THIS PROGRAM TO RUN CORRECTLY.

                4.1     SWITCH REGISTER BITS

                        THE OPERATOR HAS THE FOLLOWING OPTIONS BY SETTING
                        THE SOFTWARE SWITCH REGISTER (LOCATION 422)

                        BIT 6=1 (100 OCTAL) TO SUPPRESS TESTING EIS AND FIS OPCODES
                                (70000-75037) FOR RESERVED INSTRUCTION TRAPPING
                                IN THE LAST TEST OF THIS DIAGNOSTIC.

                        BIT 5-1 (40 OCTAL) IF WE WANT TO SUPRESS 'END OF PASS' TYPEOUT

                        BIT 4=1 (20 OCTAL) TO SUPPRESS TESTING OPCODES 75400-76777 FOR
                                RESERVED INSTRUCTIONS TRAPS IN THE LAST TEST OF THIS DIAGNOSTIC.

                        BIT 3-1 (10 OCTAL) TO SUPPRESS TESTING OPCODES 170000-177777 FOR
                                RESERVED INSTRUCTIONS TRAPS IN THE LAST TEST OF
                                THIS DIAGNOSTIC.

                        BIT 2=1 (4 OCTAL) TO SUPPRESS TESTING OPCODES 76030-76057 (DIS RESERVED OPCODE SPACE)
                                NOR EIS OPCODES FOR RESERVED INSTRUCTION TRAPS IN THE LAST
                                TEST OF THIS DIAGNOSTIC

                        BIT 1-1 (2 OCTAL) IF THERE IS NO I/O DEVICE IN THE ADDRESS SPACE
                                160000-167777.  IF THIS BIT IS SET, THIS ADDRESS AREA WILL BE
                                CHECKED BY TEST 70, EXPECTING IT TO ALL TRAP, OR ALL NOT.
                                NOTE: THIS BIT WOULD NORMALLY BE SET WHEN RUNNING ON TIM, SINCE
                                      IT CANNOT HAVE PERIPHERALS IN THIS ADDRESS AREA.

        4.2     APT -- CPU OPTIONS

                WHEN RUNNING UNDER APT, THE DON'T SIZE BIT SHOULD BE SET
                ($ENVM=200, OR 240 TO INHIBIT ALL TYPEOUTS) AND THE CPU OPTIONS
                WORD ($CPUOP) SHOULD BE SETUP TO FLAG THE PRESENCE OR ABSENCE
                OF EIS/FIS OR DIS.  TO INDICATE EIS/FIS PRESENT, SET CPU OPTIONS
                BITS 6,7 (OCTAL 300).  TO INDICATE DIS PRESENT, SET CPU OPTIONS
                BIT 5 (OCTAL 40).  THESE BITS INHIBIT TRAP TESTING OF THEIR
                RESPECTIVE OPCODES.  THE SAME THING CAN BE ACCOMPLISHED USING
                THE SWITCH REGISTER AS DESCRIBED IN SECTION 4.1; HOWEVER, THE
                DON'T SIZE BIT SHOULD STILL BE SET.

        4.3     PROGRAM AND/OR OPERATOR ACTION

                LOAD PROGRAM INTO MEMORY. (BOTTOM 4K)
                SET THE DESIRED SWITCH REGISTER BITS,IF ANY.
                LOAD ADDRESS 200.
                START.
                THE PROGRAM WILL SIZE FOR EIS/FIS AND FOR DIS.  TO INHIBIT
                SIZING, SET THE DON'T SIZE BIT (BIT 7 OF $ENVM (ODD BYTE),
                I.E. $ENV,$ENVM 100000)
```

```
                THE PROGRAM WILL PRINT END OF PASS AFTER THE 1ST ITERATION AND
                THEN PRINT IT EVERY 15 TIMES; APROXIMATELY 2 MINUTES.


        5.      OPERATION PROCEDURE


        5.2     SUBROUTINE ABSTRACTS

                5.2.1   TRAPCATCHER
                        -----------

                        THIS IS A SERIES OF INSTRUCTIONS DESIGNED TO DETECT AND
                        ISOLATE UNEXPECTED TRAPS AND INTERRUPTS, THAT OCCUR IN THE
                        TRAP AND INTERRUPT VECTOR AREA OF MEMORY.

                        THE PRINCIPLE OF THIS ROUTINE IS: THE VECTOR ENTRANCE
                        ADDRESS POINTS TO THE NEXT SEQUENTIAL WORD WHICH WILL CON-
                        TAIN A HALT (000000) (THIS LOCATION IS ALSO THE STATUS
                        WORD FOR THAT VECTOR ENTRANCE. BUT THIS WILL HAVE NO EFFECT
                        ON IT.

                        IF A HALT OCCURS IN THE TRAP OR INTERRUPT VECTOR AREA,
                        REGISTER SIX SHOULD BE EXAMINED TO DETERMINE ITS CONTENTS,
                        THEN USE REGISTER SIX CONTENTS AS AN ADDRESS TO DETERMINE
                        THE LOCATION THE PROGRAM WAS AT, WHEN THE INTERRUPT OR
                        TRAP OCCURRED. (MEMORY AS SPECIFIED BY R6 CONTAINS THE
                        PC OF THE INSTRUCTION FOLLOWING THE INSTRUCTION WHERE THE
                        TRAP OCCURRED.
                        ALSO THE CONTENTS OF '$TESTN' CONTAIN THE TEST NUMBER
                        THAT IT WAS DOING BEFORE IT TRAPPED.

        5.3     PROGRAM AND/OR OPERATOR ACTION

                5.3.1   LOADING AND STARTING AT 200 STARTS THE TEST. IF
                        AN ERROR IS DETECTED, THERE WILL BE A HALT.
```

```
                6.      ERRORS

                6.1     ALL ERRORS WILL CAUSE A HALT.
                        THE PC+2 OF THE HALT INSTRUCTION IS PRINTED
                        ON THE CONSOLE DEVICE BY THE LSI-11'S U-ODT.

                6.1.1   THE PROGRAM CHECKS TO SEE THAT THE P.C. DOESN'T JUMP
                        WITHIN THE TESTS, BY A SEQUENCE COUNT CALLED '$TSTN'
                        THIS TEST IS A SEQUENTIAL INCREMENT AND COMPARE COUNT.

                        EX:     CODE

                        INC     @#$TESTN        ;UPDATE TEST NUMBER
                        CMP     #N,@#$TESTN     ;SEQUENCE ERROR?
                        BNE     SOME LOCATION   ;BRANCH TO ERROR HALT ON SEQ ERROR
                        IMPORTANT
                ****************************

                        IF AN ERROR IS DETECTED ;IT COULD BE BECAUSE OF TWO REASONS.
                        A)      WRONG TEST NUMBER
                        B)      ERROR IN THE PRESENT TEST.

                        ////////////////////////////////////////////////////////
                        THE TEST SEQUENCE LOCATION 'TESTN' SHOULD BE CHECKED FIRST
                        TO SEE IF IT MATCHES THE PRESENT TEST.
                        IF IT DOESN'T MATCH ; THEN THE CONTENTS OF THIS LOCATION
                        TELL YOU WHICH TEST IT WAS DOING BEFORE IT HALTED.
                        ////////////////////////////////////////////////////////


                6.2     ERROR RECOVERY
                        ON TRAP ERRORS - RESTART AT STARTING ADDRESS
```

```
196
197
198             7.      RESTRICTIONS
199             7.1     STARTING RESTRICTION
200
201                     NONE
202
203             7.2     OPERATIONAL RESTRICTION
204
205                     NONE
206
207             8.      MISCELLANEOUS
208                     THERE IS A TEST THAT WILL CHECK THAT ODD ADDRESSING
209                     WILL IGNORE BIT "0"
210
211             8.1     EXECUTION TIME
212
213                     FOR ONE PASS APROXIMATELY 8 SECONDS;THEN IT TYPES
214                     "END OF PASS" APROXIMATELY EVERY 2 MINUTES.
215
216             9.      PROGRAM DESCRIPTION
217
218                     THIS PROGRAM CHECKS THAT ON ALL TRAP OPERATIONS REGISTER
219                     6 IS DECREMENTED THE CORRECT AMOUNT, THAT THE CORRECT
220                     PC IS SAVED ON THE STACK, THAT THE OLD CONDITION CODES AND
221                     PRIORITY ARE PLACED ON THE STACK AND THAT THE NEW STATUS AND
222                     CONDITION CODES ARE CORRECT.  BOTH THE "TRAP" AND "EMT"
223                     TRAP INSTRUCTIONS ARE TESTED TO SEE THAT ALL COMBINATIONS WILL
224                     TRAP.  CHECKED ALSO ARE THE RTT AND THE RTI INSTRUCTIONS AND THAT ALL
225                     RESTRICTED INSTRUCTIONS WILL TRAP.  VERIFICATION OF THE "BPT" INSTRUCTION (00003)
226                     WHICH IS USED FOR SOFTWARE DEBUG ROUTINES: ODT,DDT, IS DONE.
227                     ALSO, THE TRACE BIT IS CHECKED TO SEE IF IT CAUSES A TRAP.
228                     SPECIAL CHECKS ARE MADE TO SEE IF BUS
229                     ERROR TRAPS OCCUR ON NON-EXISTENT MEMORY.
230
```

```
   231
   232
   233                                .LIST   BIN,LOC
```

```
                                        .NLIST  MD,CND,MC
                                        .LIST   ME

000007                                  PC=%7
000006                                  SP=%6
000000                                  HLT=HALT
104400                                  TRAP=104400
104000                                  EMT=104000
000003                                  TRT=3
000004                                  ITRAP5=4
000004                                  RTRAP5=4                ;RESERVED INST AND ILLEGAL ADDRESSES
000014                                  RTRAP4=14               ;FOR TRACE TRAP
000030                                  RTRAP3=30               ;FOR EMULATOR TRAP
000020                                  RTRAP2=20               ;FOR IOT TRAP
000034                                  RTRAP1=34               ;FOR TRAP INST
177564                                  TTCSR=177564
177560                                  TRCSR=177560
177564                                  TPS=177564
177566                                  TPB=177566
000240                                  BELL=240
000240                                  NOP=240
000007                                  TRAPA=000007
000010                                  RTRAP=10
004700                                  ILLA=004700
000100                                  ILLB=100
000404                                  $TSTNM=$TESTN
000402                                  $ERROR=$FATAL
                                        .ENABL  ABS
```

```
                                        .=400
                                .SBTTL  ACT11 HOOKS

                                ;*****************************************************************************************
                                ;HOOKS REQUIRED BY ACT11
000400                                  $SVPC-.                 ;SAVE PC
000046                                  .-46
000046  013376                          $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
000052                                  .-52
000052  000000                          .WORD   0               ;;2)SET LOC.52 TO ZERO
000400                                  .-$SVPC                 ;; RESTORE PC
                                .SBTTL  APT MAILBOX-ETABLE

                                ;*****************************************************************************************
                                .EVEN
000400                          $MAIL:                          ;;APT MAILBOX
000400  000000                  $MSGTY: .WORD   AMSGTY   ;;MESSAGE TYPE CODE
000402  000000                  $FATAL: .WORD   AFATAL   ;;FATAL ERROR NUMBER
000404  000000                  $TESTN: .WORD   ATESTN   ;;TEST NUMBER
000406  000000                  $PASS:  .WORD   APASS    ;;PASS COUNT
000410  000000                  $DEVCT: .WORD   ADEVCT   ;;DEVICE COUNT
000412  000000                  $UNIT:  .WORD   AUNIT    ;;I/O UNIT NUMBER
000414  000000                  $MSGAD: .WORD   AMSGAD   ;;MESSAGE ADDRESS
000416  000000                  $MSGLG: .WORD   AMSGLG   ;;MESSAGE LENGTH
000420                          $ETABLE:                        ;;APT ENVIRONMENT TABLE
000420     000                  $ENV:   .BYTE   AENV     ;;ENVIRONMENT BYTE
000421     000                  $ENVM:  .BYTE   AENVM    ;;ENVIRONMENT MODE BITS
000422  000000                  $SWREG: .WORD   ASWREG   ;;APT SWITCH REGISTER
000424  000000                  $USWR:  .WORD   AUSWR    ;;USER SWITCHES
000426  000000                  $CPUOP: .WORD   ACPUOP   ;;CPU TYPE,OPTIONS
                                ;*                      BITS 15-11=CPU TYPE
                                ;*                              11/04=01,11/05=02,11/20=03,11/40-04,11/45-05
                                ;*                              11/70=06,PDQ=07,Q=10
                                ;*                      BIT 10=REAL TIME CLOCK
                                ;*                      BIT  9=FLOATING POINT PROCESSOR
                                ;*                      BIT  8=MEMORY MANAGEMENT
000430     000                  $MAMS1: .BYTE   AMAMS1   ;;HIGH ADDRESS,M.S. BYTE
000431     000                  $MTYP1: .BYTE   AMTYP1   ;;MEM. TYPE,BLK#1
                                ;*                      MEM.TYPE BYTE   --  (HIGH BYTE)
                                ;*                              900 NSEC CORE=001
                                ;*                              300 NSEC BIPOLAR=002
                                ;*                              500 NSEC MOS=003
000432  000000                  $MADR1: .WORD   AMADR1   ;;HIGH ADDRESS,BLK#1
                                ;*                        MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF ''TYPE'' ABOVE
000434     000                  $MAMS2: .BYTE   AMAMS2   ;;HIGH ADDRESS,M.S. BYTE
000435     000                  $MTYP2: .BYTE   AMTYP2   ;;MEM.TYPE,BLK#2
000436  000000                  $MADR2: .WORD   AMADR2   ;;MEM.LAST ADDRESS,BLK#2
000440     000                  $MAMS3: .BYTE   AMAMS3   ;;HIGH ADDRESS,M.S.BYTE
000441     000                  $MTYP3: .BYTE   AMTYP3   ;;MEM.TYPE,BLK#3
000442  000000                  $MADR3: .WORD   AMADR3   ;;MEM.LAST ADDRESS,BLK#3
000444     000                  $MAMS4: .BYTE   AMAMS4   ;;HIGH ADDRESS,M.S.BYTE
000445     000                  $MTYP4: .BYTE   AMTYP4   ;;MEM.TYPE,BLK#4
000446  000000                  $MADR4: .WORD   AMADR4   ;;MEM.LAST ADDRESS,BLK#4
000450                          $ETEND:
```

```
                                .MEXIT
                                .SBTTL  APT PARAMETER BLOCK

                                ;*****************************************************************************
                                ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                                ;*****************************************************************************
            000450                      .$X=.    ;;SAVE CURRENT LOCATION
            000024                      .=24     ;;SET POWER FAIL TO POINT TO START OF PROGRAM
000024      000200                      200      ;;FOR APT START UP
            000044                      .-44     ;;POINT TO APT INDIRECT ADDRESS PNTR.
000044      000450                      $APTHDR  ;;POINT TO APT HEADER BLOCK
            000450                      .-.$X    ;;RESET LOCATION COUNTER
                                ;*****************************************************************************
                                ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
                                ;INTERFACE SPEC.

000450                          $APTHD:
000450  000000                  $HIBTS: .WORD   0        ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
000452  000400                  $MBADR: .WORD   $MAIL    ;;ADDRESS OF APT MAILBOX (BITS 0-15)
000454  000010                  $TSTM:  .WORD   10       ;;RUN TIM OF LONGEST TEST
000456  000015                  $PASTM: .WORD   15       ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
000460  000000                  $UNITM: .WORD   0        ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
000462  000024                          .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
```

```
                000200                          .=200
000200  000167  000276                          JMP     START
                000210                          .=210
000210  005037  000406                          CLR     @#$PASS         ;CLEAR THE PASS COUNT
000214  000167  000262                          JMP     START
                000500                          .=500
000500  000000                  BUFF:   00000
000502  012767  013714  177314 START:  MOV     #PWRDWN,24      ;SET UP THE POWER DOWN VECTOR
000510  012767  000340  177310          MOV     #340,26         ;SET UP POWER DOWN PRIORITY
000516  012706  000500                  MOV     #BUFF,SP        ;SET STACK POINTER
000522  105737  177565                  TSTB    @#TPS+1         ;TEST ODD BYTE OF CONSOLE IN CASE ON A
                                                                ;PDT-11.  THIS WILL RESWAP COMM AND CONSOLE
                                                                ;ADDRESSES BACK TO NORMAL IN CASE ON APT.
000526  004567  013120                  JSR     R5,TYPE         ;TYPE THE TITLE
000532  014024                    TITLE                         ;"CVKADX"
000534  105767  177661                  TSTB    $ENVM           ;DON'T SIZE BIT SET?
000540  100402                          BMI     BEGIN           ;BRANCH IF YES
000542  004767  012662                  JSR     PC,SIZE         ;SIZE IF ALLOWED

000546  012737  177777  013426 BEGIN:  MOV     #-1,@#PASSPT
000554  012702  000400         RESTRT: MOV     #$MSGTY,%2
000560  005067  177614                  CLR     $MSGTY
000564  005067  177614                  CLR     $TSTNM
000570  005067  177606                  CLR     $ERROR
000574  000167  000026                  JMP     TST1
000600  000000                  K1:     0
000602  000000                  K2:     0
000604  000000                  K3:     0
000606  000000                  K4:     0
000610  000000                  K5:     0
000612  000000                  K6:     0
000614  052525                  K7:     052525
000616  052400                  K10:    052400
000620  000000                  K11:    0
000622  000000                  K12:    0
000624  000000                  HERE:   0
```

```
                        ;*****************************************************************************
                        ;TEST 1 AUTO INCREMENT/DECREMENT OF R6 FOR WORD AND BYTES
                        ;*****************************************************************************
000626 005237 000404    TST1:   INC     @#$TESTN        ;UPDATE TEST NUMBER
000632 022737 000001 000404     CMP     #1,@#$TESTN     ;SEQUENCE ERROR?
000640 001124                   BNE     TST2-12 ;BR TO ERROR HALT ON SEQ ERROR
000642 005006           R6TST:  CLR     %6
000644 112667 177754            MOVB    (6)+,HERE       ;SIX SHOULD INCREMENT BY TWO
000650 020627 000002            CMP     %6,#2
000654 001405                   BEQ     1$
000656 012737 000001 000402     MOV     #1,@#$FATAL     ;MOVE TO MAILBOX #  *******  1  *******
000664 005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
000666 000000                   HALT                    ;R6 DID NOT AUTO INCREMENT BY TWO
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 764

000670 012706 001000    1$:     MOV     #1000,%6
000674 114667 177724            MOVB    -(6),HERE       ;SHOULD DECREMENT BY TWO
000700 020627 000776            CMP     %6,#776
000704 001405                   BEQ     2$
000706 012737 000002 000402     MOV     #2,@#$FATAL     ;MOVE TO MAILBOX #  *******  2  *******
000714 005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
000716 000000                   HALT                    ;R6 DID NOT AUTO DECREMENT BY 2
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 750

000720 005006           2$:     CLR     %6
000722 112626                   MOVB    (6)+,(6)+       ;DOUBLES AUTO INCREMENT OF R6
000724 020627 000004            CMP     %6,#4
000730 001405                   BEQ     3$
000732 012737 000003 000402     MOV     #3,@#$FATAL     ;MOVE TO MAILBOX #  *******  3  *******
000740 005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
000742 000000                   HALT                    ;WRONG AUTO INCREMENT OF R6
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 736

000744 005006           3$:     CLR     %6
000746 005004                   CLR     %4
000750 122624                   CMPB    (6)+,(4)+       ;TEST INCREMENT OF R6
000752 020627 000002            CMP     %6,#2
000756 001405                   BEQ     4$
000760 012737 000004 000402     MOV     #4,@#$FATAL     ;MOVE TO MAILBOX #  *******  4  *******
000766 005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
000770 000000                   HALT                    ;WRONG INCREMENT OF R6
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 723

000772 005006           4$:     CLR     %6
000774 005004                   CLR     %4
000776 122426                   CMPB    (4)+,(6)+       ;TEST INCREMENT OF R6
001000 020627 000002            CMP     %6,#2
001004 001405                   BEQ     5$
001006 012737 000005 000402     MOV     #5,@#$FATAL     ;MOVE TO MAILBOX #  *******  5  *******
001014 005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001016 000000                   HALT                    ;WRONG INCREMENT OF R6
```

```
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 710

001020  005006                  5$:    CLR     %6
001022  005004                         CLR     %4
001024  122624                         CMPB    (6)+,(4)+       ;TEST INCREMENT OF R4
001026  020427  000001                 CMP     %4,#1
001032  001405                         BEQ     6$
001034  012737  000006  000402         MOV     #6,@#$FATAL     ;MOVE TO MAILBOX #  *******  6  *******
001042  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001044  000000                         HALT                    ;WRONG INCREMENT OF R4
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 675

001046  005006                  6$:    CLR     %6
001050  005004                         CLR     %4
001052  122426                         CMPB    (4)+,(6)+       ;TEST INCREMENT OF R4
001054  020427  000001                 CMP     %4,#1
001060  001405                         BEQ     7$
001062  012737  000007  000402         MOV     #7,@#$FATAL     ;MOVE TO MAILBOX #  *******  7  *******
001070  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001072  000000                         HALT                    ;WRONG INCREMENT OF R4
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 662

001074  012706  001000          7$:    MOV     #1000,%6
001100  124667  177520                 CMPB    -(6),HERE       ;TEST DECREMENT OF R6
001104  022706  000776                 CMP     #776,%6
001110  001405                         BEQ     TST2
001112  012737  000010  000402         MOV     #10,@#$FATAL    ;MOVE TO MAILBOX #  *******  10  *******
001120  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001122  000000                         HALT                    ;WRONG DECREMENT OF R6,OR WRONG $TESTN
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 646
```

```
                                        ;*****************************************************************************
                                        ;TEST 2 TRANSFER OF BYTE USING R6
                                        ;*****************************************************************************
001124  005237  000404          TST2:   INC     @#$TESTN        ;UPDATE TEST NUMBER
001130  022737  000002  000404          CMP     #2,@#$TESTN     ;SEQUENCE ERROR?
001136  001137                        BNE     TST3-12 ;BR TO ERROR HALT ON SEQ ERROR
001140  012767  123456  177442        MOV     #123456,K5
001146  012767  050505  177424        MOV     #050505,K1
001154  012705  000600                MOV     #K1,%5          ;%5-(050505)K1
001160  012706  000610                MOV     #K5,%6          ;%6=(123456)K5
001164  112625                        MOVB    (6)+,(5)+       ;LOW .BYTE OF R6 TO R5
001166  022767  050456  177404        CMP     #050456,K1
001174  001405                        BEQ     1$
001176  012737  000011  000402        MOV     #11,@#$FATAL    ;MOVE TO MAILBOX #  *******  11  *******
001204  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001206  000000                        HALT                    ;FALSE TRANSFER OF .BYTE
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 753
001210  012767  123456  177372  1$:   MOV     #123456,K5
001216  012767  050505  177354        MOV     #050505,K1
001224  012705  000600                MOV     #K1,%5          ;%5(C50505)K1
001230  012706  000612                MOV     #K6,%6          ;%6(123456)K5
001234  114625                        MOVB    -(6),(5)+       ;LOW .BYTE OF R6 TO R5 (DECREMENT)
001236  026727  177336  050456        CMP     K1,#050456
001244  001405                        BEQ     2$
001246  012737  000012  000402        MOV     #12,@#$FATAL    ;MOVE TO MAILBOX #  *******  12  *******
001254  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001256  000000                        HALT                    ;FALSE R6 .BYTE TRANSFER
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 727
001260  012767  123456  177312  2$:   MOV     #123456,K1
001266  012767  050505  177314        MOV     #050505,K5
001274  012705  000600                MOV     #K1,%5          ;(123456)
001300  012706  000610                MOV     #K5,%6          ;(050505)
001304  112526                        MOVB    (5)+,(6)+       ;LOW OF R5 TO LOW OF R6
001306  022767  050456  177274        CMP     #050456,K5
001314  001405                        BEQ     3$
001316  012737  000013  000402        MOV     #13,@#$FATAL    ;MOVE TO MAILBOX #  *******  13  *******
001324  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001326  000000                        HALT                    ;FALSE R6 .BYTE TRANSFER
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 703
001330  012767  123456  177242  3$:   MOV     #123456,K1
001336  012767  050505  177244        MOV     #050505,K5
001344  012705  000601                MOV     #K1+1,%5        ;123456
001350  012706  000610                MOV     #K5,%6          ;050505
001354  112526                        MOVB    (5)+,(6)+       ;HIGH OF R5 TO LOW OF R6
001356  026727  177226  050647        CMP     K5,#050647
001364  001405                        BEQ     4$
001366  012737  000014  000402        MOV     #14,@#$FATAL    ;MOVE TO MAILBOX #  *******  14  *******
001374  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001376  000000                        HALT                    ;FALSE R6 .BYTE TRANSFER
```

```
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 657

001400  012767  123456  177172  4$:     MOV     #123456,K1
001406  012767  050505  177174           MOV     #050505,K5
001414  012705  000601                   MOV     #K1+1,%5        ;R5-123456-ODD ADDRESS
001420  012706  000610                   MOV     #K5,%6          ;R6-050505--.EVEN ADDRESS
001424  112625                           MOVB    (6)+,(5)+       ;LOW OF R6 TO HIGH OF R5
001426  022767  042456  177144           CMP     #042456,K1
001434  001405                           BEQ     TST3
001436  012737  000015  000402           MOV     #15,@#$FATAL    ;MOVE TO MAILBOX #  *******  15  *******
001444  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001446  000000                           HALT                    ;FAILED LOW OF 6 TO HIGH OF 5,OR WRONG $TESTN
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 633
```

```
                                ;*****************************************************************************
                                ;TEST 3 BYTE OPERATION WITH SEQUENTIAL ODD/EVEN ADDRESS
                                ;*****************************************************************************
001450  005237  000404          TST3:   INC     @#$TESTN        ;UPDATE TEST NUMBER
001454  022737  000003  000404          CMP     #3,@#$TESTN     ;SEQUENCE ERROR?
001462  001103                        BNE     TST4-12 ;BR TO ERROR HALT ON SEQ ERROR
001464  126767  177124  177123        CMPB    K7,K7+1         ;SAME .WORD LOW TO HIGH
001472  001405                        BEQ     1$
001474  012737  000016  000402        MOV     #16,@#$FATAL    ;MOVE TO MAILBOX #  *******  16  *******
001502  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001504  000000                        HALT                    ;SHOULD COMPARE LOW TO HIGH
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 766
001506  126767  177103  177100  1$:   CMPB    K7+1,K7         ;COMPARE ODD TO .EVEN SAME .WORD
001514  001405                        BEQ     2$
001516  012737  000017  000402        MOV     #17,@#$FATAL    ;MOVE TO MAILBOX #  *******  17  *******
001524  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001526  000000                        HALT                    ;ODD TO .EVEN .BYTE FAILURE
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 755
001530  126767  177063  177056  2$:   CMPB    K10+1,K7        ;SEQUENTIAL .BYTES
                                                                ;DIFFERENT .WORDS
001536  001462                        BEQ     TST4
001540  012737  000020  000402        MOV     #20,@#$FATAL    ;MOVE TO MAILBOX #  *******  20  *******
001546  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001550  000000                        HALT                    ;ODD TO .EVEN FAILED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 744
001552  126767  177040  177032        CMPB    K10,K6
001560  001405                        BEQ     3$
001562  012737  000021  000402        MOV     #21,@#$FATAL    ;MOVE TO MAILBOX #  *******  21  *******
001570  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001572  000000                        HALT                    ;.EVEN TO EVEN FAILED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 733
001574  126767  177015  177015  3$:   CMPB    K7+1,K10+1
001602  001405                        BEQ     4$
001604  012737  000022  000402        MOV     #22,@#$FATAL    ;MOVE TO MAILBOX #  *******  22  *******
001612  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001614  000000                        HALT                    ;ODD TO ODD FAILED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 723
001616  126767  176774  176773  4$:   CMPB    K10,K10+1
001624  001005                        BNE     5$
001626  012737  000023  000402        MOV     #23,@#$FATAL    ;MOVE TO MAILBOX #  *******  23  *******
001634  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001636  000000                        HALT                    ;LOW TO HIGH IN SAME .WORD FAILED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 711
001640  126767  176753  176751  5$:   CMPB    K10+1,K10+1
```

```
  599  001646  001405                          BEQ     6$
  600  001650  012737  000024  000402          MOV     #24,@#$FATAL    ;MOVE TO MAILBOX #  *******  24  *******
  601  001656  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  602  001660  000000                          HALT                    ;HIGH TO LOW IN SAME .WORD FAILED
  603                                                                  ; TO SCOPE REPLACE HALT W/ 240
  604                                                                  ; AND REPLACE NEXT INST W/ 700
  605
  606  001662  126767  176730  176725  6$:     CMPB    K10,K7+1
  607  001670  001005                          BNE     TST4
  608  001672  012737  000025  000402          MOV     #25,@#$FATAL    ;MOVE TO MAILBOX #  *******  25  *******
  609  001700  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  610  001702  000000                          HALT                    ;.EVEN TO ODD FAILED,OR WRONG $TESTN,OR WRONG $TESTN
  611                                                                  ; TO SCOPE REPLACE HALT W/ 240
  612                                                                  ; AND REPLACE NEXT INST W/ 667
```

```
                                        ;*****************************************************************************
                                        ;TEST 4 THE CC BITS
                                        ;*****************************************************************************
001704  005237  000404        TST4:   INC     @#$TESTN        ;UPDATE TEST NUMBER
001710  022737  000004  000404        CMP     #4,@#$TESTN     ;SEQUENCE ERROR?
001716  001070                      BNE     TST5-12 ;BR TO ERROR HALT ON SEQ ERROR
001720  000277                      SCC                     ;SET STATUS
001722  005067  011360              CLR     STATUS          ;CLEAR STATUS
001726  106467  011354              MTPS    STATUS
001732  103005                      BCC     1$
001734  012737  000026  000402      MOV     #26,@#$FATAL    ;MOVE TO MAILBOX #  *******  26  *******
001742  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001744  000000                      HALT                    ;C NOT CLEAR
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 764
001746                          1$:
001746  102005                      BVC     2$
001750  012737  000027  000402      MOV     #27,@#$FATAL    ;MOVE TO MAILBOX #  *******  27  *******
001756  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001760  000000                      HALT                    ;V NOT CLEAR
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 756
001762                          2$:
001762  001005                      BNE     3$
001764  012737  000030  000402      MOV     #30,@#$FATAL    ;MOVE TO MAILBOX #  *******  30  *******
001772  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001774  000000                      HALT                    ;Z NOT CLEAR
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 750
001776                          3$:
001776  100005                      BPL     4$
002000  012737  000031  000402      MOV     #31,@#$FATAL    ;MOVE TO MAILBOX #  *******  31  *******
002006  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002010  000000                      HALT                    ;N NOT CLEAR
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 742

002012  000257              4$:     CCC                     ;CLEAR CONDITION CODES
002014  106767  011266              MFPS    STATUS
002020  052767  000017  011260      BIS     #17,STATUS      ;SET STATUS TO ONES
002026  106467  011254              MTPS    STATUS

002032  103405                      BCS     5$
002034  012737  000032  000402      MOV     #32,@#$FATAL    ;MOVE TO MAILBOX #  *******  32  *******
002042  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002044  000000                      HALT                    ;C NOT SET
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 724
002046                          5$:
002046  102405                      BVS     6$
002050  012737  000033  000402      MOV     #33,@#$FATAL    ;MOVE TO MAILBOX #  *******  33  *******
002056  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002060  000000                      HALT                    ;V NOT SET
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 716
```

```
   669  002062                                  6$:
   670  002062  001405                                  BEQ     7$
   671  002064  012737  000034  000402                  MOV     #34,@#$FATAL    ;MOVE TO MAILBOX #  *******  34  *******
   672  002072  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   673  002074  000000                                  HALT                    ;Z NOT SET
   674                                                                          ; TO SCOPE REPLACE HALT W/ 240
   675                                                                          ; AND REPLACE NEXT INST W/ 710
   676  002076                                  7$:
   677  002076  100405                                  BMI     TST5
   678  002100  012737  000035  000402                  MOV     #35,@#$FATAL    ;MOVE TO MAILBOX #  *******  35  *******
   679  002106  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   680  002110  000000                                  HALT                    ;N NOT SET,OR WRONG $TESTN
   681                                                                          ; TO SCOPE REPLACE HALT W/ 240
   682                                                                          ; AND REPLACE NEXT INST W/ 702
```

```
                                        ;*****************************************************************************
                                        ;TEST 5 THAT A TRAP OCCURES ON A RESERVED INSTRUCTION
                                        ;*****************************************************************************
002112  005237  000404        TST5:   INC     @#$TESTN        ;UPDATE TEST NUMBER
002116  022737  000005  00040-         CMP     #5,@#$TESTN     ;SEQUENCE ERROR?
002124  001006                        BNE     TST6-12 ;BR TO ERROR HALT ON SEQ ERROR
002126  012706  000500                MOV     #BUFF,SP        ;STACK POINTER SETUP
002132  012767  002154  175650        MOV     #RETA,RTRAP     ;RETURN LOCATION
002140  000007                        TRAPA                   ;RESERVED INSTRUCTION, SHOULD TRAP
002142  012737  000036  000402        MOV     #36,@#$FATAL    ;MOVE TO MAILBOX #  *******  36  *******
002150  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002152  000000                        HALT                    ;DID NOT TRAP OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 764
002154                          RETA:
                                        ;*****************************************************************************
                                        ;TEST 6 DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                        ;*****************************************************************************
002154  005237  000404        TST6:   INC     @#$TESTN        ;UPDATE TEST NUMBER
002160  022737  000006  000404        CMP     #6,@#$TESTN     ;SEQUENCE ERROR?
002166  001011                        BNE     TST7-12 ;BR TO ERROR HALT ON SEQ ERROR
002170  012706  000500                MOV     #BUFF,SP        ;STACK POINTER SETUP
002174  012767  002204  175606        MOV     #RETB,RTRAP     ;RETURN POINTER
002202  000007                        TRAPA                   ;RESERVED INSTRUCTION
002204  020627  000474        RETB:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
002210  001405                        BEQ     TST7
002212  012737  000037  000402        MOV     #37,@#$FATAL    ;MOVE TO MAILBOX #  *******  37  *******
002220  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002222  000000                        HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 761
```

```
                                        ;*****************************************************************************
                                        ;TEST 7 THAT PROPER P.C. IS SAVED
                                        ;*****************************************************************************
002224  005237  000404          TST7:   IN      @#$TESTN        ;UPDATE TEST NUMBER
002230  022737  000007  000404          CMP     #7,@#$TESTN     ;SEQUENCE ERROR?
002236  001012                        BNE     TST10-12        ;BR TO ERROR HALT ON SEQ ERROR
002240  012706  000500                MOV     #BUFF,SP        ;STACK POINTER SETUP
002244  012767  002254  175536        MOV     #RETC,RTRAP     ;RETURN FROM TRAP POINTER
002252  000007                  INSTC:  TRAPA                   ;TRAP ON THIS INSTRUCTION
002254  022767  002254  176212  RETC:   CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
002262  001405                        BEQ     TST10
002264  012737  000040  000402        MOV     #40,@#$FATAL    ;MOVE TO MAILBOX #  *******  40  *******
002272  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002274  000000                        HALT                    ;INCORRECT P.C.,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 760
                                        ;*****************************************************************************
                                        ;TEST 10 THAT 'OLD' STATUS AND PRIORITY ARE PLACED ON STACK
                                        ;*****************************************************************************
002276  005237  000404          TST10:  INC     @#$TESTN        ;UPDATE TEST NUMBER
002302  022737  000010  000404          CMP     #10,@#$TESTN    ;SEQUENCE ERROR?
002310  001044                        BNE     TST11-12        ;BR TO ERROR HALT ON SEQ ERROR
002312  012706  000500                MOV     #BUFF,SP        ;SET UP
002316  012767  002340  175464        MOV     #RETD,RTRAP     ;SET UP
002324  005067  010756                CLR     STATUS          ;CLEAR STATUS AND PRIORITY
002330  106467  010752                MTPS    STATUS
002334  000257                        CCC
002336  000007                        TRAPA                   ;TRAP
002340  026727  176132  000000  RETD:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
002346  001405                        BEQ     1$
002350  012737  000041  000402        MOV     #41,@#$FATAL    ;MOVE TO MAILBOX #  *******  41  *******
002356  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002360  000000                        HALT                    ;INCORRECT STATUS
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 753
002362  012706  000500          1$:     MOV     #BUFF,SP        ;SET UP
002366  012767  002412  175414        MOV     #RETE,RTRAP     ;SET UP
002374  012767  000357  010704        MOV     #357,STATUS     ;SET PRIORITY
002402  106467  010700                MTPS    STATUS
002406  000277                        SCC                     ;SET STATUS
002410  000007                        TRAPA                   ;TRAP
002412  026727  176060  000357  RETE:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
002420  001405                        BEQ     TST11
002422  012737  000042  000402        MOV     #42,@#$FATAL    ;MOVE TO MAILBOX #  *******  42  *******
002430  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002432  000000                        HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 726
```

```
                                ;*****************************************************************************
                                ;TEST 11 THAT 'NEW' STATUS IS CORRECT
                                ;*****************************************************************************
002434  005237  000404        TST11:  INC     @#$TESTN        ;UPDATE TEST NUMBER
002440  022737  000011  000404         CMP     #11,@#$TESTN    ;SEQUENCE ERROR?
002446  001125                        BNE     RSTP1           ;BR TO ERROR HALT ON SEQ ERROR
002450  012706  000500                MOV     #BUFF,SP
002454  012767  002470  175326        MOV     #RETF,RTRAP
002462  005067  175324                CLR     RTRAP+2         ;CLEAR FUTURE PRIORITY AND CC
002466  000007                        TRAPA
002470                          RETF:
002470  100005                        BPL     1$
002472  012737  000043  000402        MOV     #43,@#$FATAL    ;MOVE TO MAILBOX #  *******  43  *******
002500  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002502  000000                        HALT                    ;C NOT CLEARED
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 761
002504                          1$:
002504  001005                        BNE     2$
002506  012737  000044  000402        MOV     #44,@#$FATAL    ;MOVE TO MAILBOX #  *******  44  *******
002514  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002516  000000                        HALT                    ;Z NOT CLEARED
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 753
002520                          2$:
002520  102005                        BVC     3$
002522  012737  000045  000402        MOV     #45,@#$FATAL    ;MOVE TO MAILBOX #  *******  45  *******
002530  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002532  000000                        HALT                    ;V NOT CLEARED
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 745
002534                          3$:
002534  103005                        BCC     4$
002536  012737  000046  000402        MOV     #46,@#$FATAL    ;MOVE TO MAILBOX #  *******  46  *******
002544  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002546  000000                        HALT                    ;C NOT CLEARED
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 737
002550  106767  010532        4$:     MFPS    STATUS
002554  032767  000340  010524        BIT     #340,STATUS             ;TEST PRIORITY
002562  001405                        BEQ     5$
002564  012737  000047  000402        MOV     #47,@#$FATAL    ;MOVE   ? MAILBOX #  *******  47  *******
002572  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002574  000000                        HALT                    ;PRIORITY NOT ZERO
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 724
002576  012706  000500        5$:     MOV     #BUFF,SP
002602  012767  002620  175200        MOV     #RETG,RTRAP
002610  012767  000357  175174        MOV     #357,RTRAP+2    ;SET NEW ''CC'' AND PRIORITY
002616  000007                        TRAPA                   ;TRAP HERE
002620                          RETG:
002620  100405                        BMI     1$
002622  012737  000050  000402        MOV     #50,@#$FATAL    ;MOVE TO MAILBOX #  *******  50  *******
002630  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002632  000000                        HALT                    ;N NOT SET
```

```
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 705
002634                                          1$:
002634  001405                                         BEQ     2$
002636  012737  000051  000402                         MOV     #51,@#$FATAL    ;MOVE TO MAILBOX #  *******  51  *******
002644  005212                                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002646  000000                                         HALT                    ;Z NOT SET
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 677
002650                                          2$:
002650  102405                                         BVS     3$
002652  012737  000052  000402                         MOV     #52,@#$FATAL    ;MOVE TO MAILBOX #  *******  52  *******
002660  005212                                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002662  000000                                         HALT                    ;V NOT SET
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 671
002664                                          3$:
002664  103405                                         BCS     4$
002666  012737  000053  000402                         MOV     #53,@#$FATAL    ;MOVE TO MAILBOX #  *******  53  *******
002674  005212                                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002676  000000                                         HALT                    ;C NOT SET
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 663
002700  106767  010402                  4$:     MFPS    STATUS
002704  016706  010376                          MOV     STATUS,SP
002710  042706  000017                          BIC     #17,SP
002714  022706  000340                          CMP     #340,SP
002720  001405                                  BEQ     RST1
002722                                  RSTP1:
002722  012737  000054  000402                 MOV     #54,@#$FATAL    ;MOVE TO MAILBOX #  *******  54  *******
002730  005212                                 INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002732  000000                                 HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 645
002734  012767  000012  175046  RST1:   MOV     #12,10
002742  005067  175044                  CLR     12
```

```
                                        ;*****************************************************************************
                                        ;TEST 12 THAT A TRAP OCCURES FOR A 'TRAP'' INSTRUCTION
                                        ;*****************************************************************************
002746  005237  000404        TST12:  INC     @#$TESTN        ;UPDATE TEST NUMBER
002752  022737  000012  000404        CMP     #12,@#$TESTN    ;SEQUENCE ERROR?
002760  001006                      BNE     TST13-12        ;BR TO ERROR HALT ON SEQ ERROR
002762  012706  000500              MOV     #BUFF,SP        ;STACK POINTER SETUP
002766  012767  003010  175040      MOV     #RETA1,RTRAP1   ;RETURN LOCATION
002774  104400                      TRAP                    ;RESERVED INSTRUCTION, SHOULD TRAP
002776  012737  000055  000402      MOV     #55,@#$FATAL    ;MOVE TO MAILBOX #  *******  55  *******
003004  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003006  000000                      HALT                    ;DID NOT TRAP,OR WRONG $TESN
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 764
003010                          RETA1:
                                        ;*****************************************************************************
                                        ;TEST 13 DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                        ;*****************************************************************************
003010  005237  000404        TST13:  INC     @#$TESTN        ;UPDATE TEST NUMBER
003014  022737  000013  000404        CMP     #13,@#$TESTN    ;SEQUENCE ERROR?
003022  001011                      BNE     TST14-12        ;BR TO ERROR HALT ON SEQ ERROR
003024  012706  000500              MOV     #BUFF,SP        ;STACK POINTER SETUP
003030  012767  003040  174776      MOV     #RETB1,RTRAP1   ;RETURN POINTER
003036  104400                      TRAP                    ;RESERVED INSTRUCTION
003040  020627  000474        RETB1:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
003044  001405                      BEQ     TST14
003046  012737  000056  000402      MOV     #56,@#$FATAL    ;MOVE TO MAILBOX #  *******  56  *******
003054  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003056  000000                      HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 761
                                        ;*****************************************************************************
                                        ;TEST 14 THAT PROPER P.C. IS SAVED
                                        ;*****************************************************************************
003060  005237  000404        TST14:  INC     @#$TESTN        ;UPDATE TEST NUMBER
003064  022737  000014  000404        CMP     #14,@#$TESTN    ;SEQUENCE ERROR?
003072  001012                      BNE     TST15-12        ;BR TO ERROR HALT ON SEQ ERROR
003074  012706  000500              MOV     #BUFF,SP        ;STACK POINTER SETUP
003100  012767  003110  174726      MOV     #RETC1,RTRAP1   ;RETURN FROM TRAP POINTER
003106  104400                      TRAP                    ;TRAP ON THIS INSTRUCTION
003110  022767  003110  175356  RETC1:  CMP     #.,BUFF-4       ;CHECK INCREMENTED P.C.
003116  001405                      BEQ     TST15
003120  012737  000057  000402      MOV     #57,@#$FATAL    ;MOVE TO MAILBOX #  *******  57  *******
003126  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003130  000000                      HALT                    ;INCORRECT P.C.,OR WRONG $TESTN
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 760
```

```
                                ;*****************************************************************************
                                ;TEST 15 THAT 'OLD' STATUS AND PRIORITY ARE PLACED ON STACK
                                ;*****************************************************************************
003132  005237  000404          TST15:  INC     @#$TESTN        ;UPDATE TEST NUMBER
003136  022737  000015  000404          CMP     #15,@#$TESTN    ;SEQUENCE ERROR?
003144  001043                        BNE     TST16-12        ;BR TO ERROR HALT ON SEQ ERROR
003146  012706  000500                MOV     #BUFF,SP        ;SET UP
003152  012767  003174  174654        MOV     #RETD1,RTRAP1   ;SET UP
003160  005067  010122                CLR     STATUS          ;CLEAR STATUS AND PRIORITY
003164  106467  010116                MTPS    STATUS
003170  000257                        CCC
003172  104400                        TRAP                    ;TRAP
003174  026727  175276  000000  RETD1: CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
003202  001405                        BEQ     1$
003204  012737  000060  000402        MOV     #60,@#$FATAL    ;MOVE TO MAILBOX #  *******  60  *******
003212  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003214  000000                        HALT                    ;INCORRECT STATUS
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 753
003216  012706  000500          1$:     MOV     #BUFF,SP        ;SET UP
003222  012767  003244  174604        MOV     #RETE1,RTRAP1   ;SET UP
003230  012767  000357  010050        MOV     #357,STATUS             ;SET PRIORITY
003236  106467  010044                MTPS    STATUS
003242  104400                        TRAP                    ;SET CC
003244  026727  175226  000357  RETE1: CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
003252  001405                        BEQ     TST16
003254  012737  000061  000402        MOV     #61,@#$FATAL    ;MOVE TO MAILBOX #  *******  61  *******
003262  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003264  000000                        HALT                    ;INCORRECT STATUS ON STACK
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 727
```

```
                                        ;*****************************************************************************
                                        ;TEST 16 THAT 'NEW'' STATUS IS CORRECT
                                        ;*****************************************************************************
003266  005237  000404          TST16:  INC     @#$TESTN        ;UPDATE TEST NUMBER
003272  022737  000016  000404          CMP     #16,@#$TESTN    ;SEQUENCE ERROR?
003300  001125                        BNE     TST17-12        ;BR TO ERROR HALT ON SEQ ERROR
003302  012706  000500                MOV     #BUFF,SP
003306  012767  003322  174520        MOV     #RETF1,RTRAP1
003314  005067  174516                CLR     RTRAP1+2        ;CLEAR FUTURE PRIORITY AND CC
003320  104400                        TRAP
003322                          RETF1:
003322  100005                        BPL     1$
003324  012737  000062  000402        MOV     #62,@#$FATAL    ;MOVE TO MAILBOX #  *******  62  *******
003332  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003334  000000                        HALT                    ;C NOT CLEARED
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 761
003336                          1$:
003336  001005                        BNE     2$
003340  012737  000063  000402        MOV     #63,@#$FATAL    ;MOVE TO MAILBOX #  *******  63  *******
003346  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003350  000000                        HALT                    ;Z NOT CLEARED
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 753
003352                          2$:
003352  102005                        BVC     3$
003354  012737  000064  000402        MOV     #64,@#$FATAL    ;MOVE TO MAILBOX #  *******  64  *******
003362  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003364  000000                        HALT                    ;V NOT CLEARED
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 745
003366                          3$:
003366  103005                        BCC     4$
003370  012737  000065  000402        MOV     #65,@#$FATAL    ;MOVE TO MAILBOX #  *******  65  *******
003376  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003400  000000                        HALT                    ;C NOT CLEARED
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 737
003402  106767  007700          4$:     MFPS    STATUS
003406  032767  000340  007672        BIT     #340,STATUS             ;TEST PRIORITY
003414  001405                        BEQ     5$
003416  012737  000066  000402        MOV     #66,@#$FATAL    ;MOVE TO MAILBOX #  *******  66  *******
003424  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003426  000000                        HALT                    ;PRIORITY NOT ZERO
                                                              ; TO SCOPE REPLACE HALT W/ 240
                                                              ; AND REPLACE NEXT INST W/ 724
003430  012706  000500          5$:     MOV     #BUFF,SP
003434  012767  003452  174372        MOV     #RETG1,RTRAP1
003442  012767  000357  174366        MOV     #357,RTRAP1+2   ;SET NEW ''CC'' AND PRIORITY
003450  104400                        TRAP                    ;TRAP HERE
003452                          RETG1:
003452  100405                        BMI     1$
003454  012737  000067  000402        MOV     #67,@#$FATAL    ;MOVE TO MAILBOX #  *******  67  *******
003462  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003464  000000                        HALT                    ;N NOT SET
```

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 992                                                    ; TO SCOPE REPLACE HALT W/ 240
 993                                                    ; AND REPLACE NEXT INST W/ 705
 994  003466                              1$:
 995  003466  001405                     BEQ     2$
 996  003470  012737  000070  000402     MOV     #70,@#$FATAL    ;MOVE TO MAILBOX #  *******  70  *******
 997  003476  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 998  003500  000000                     HALT                    ;Z NOT SET
 999                                                    ; TO SCOPE REPLACE HALT W/ 240
1000                                                    ; AND REPLACE NEXT INST W/ 677
1001  003502                              2$:
1002  003502  102405                     BVS     3$
1003  003504  012737  000071  000402     MOV     #71,@#$FATAL    ;MOVE TO MAILBOX #  *******  71  *******
1004  003512  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1005  003514  000000                     HALT                    ;V NOT SET
1006                                                    ; TO SCOPE REPLACE HALT W/ 240
1007                                                    ; AND REPLACE NEXT INST W/ 671
1008  003516                              3$:
1009  003516  103405                     BCS     4$
1010  003520  012737  000072  000402     MOV     #72,@#$FATAL    ;MOVE TO MAILBOX #  *******  72  *******
1011  003526  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1012  003530  000000                     HALT                    ;C NOT SET
1013                                                    ; TO SCOPE REPLACE HALT W/ 240
1014                                                    ; AND REPLACE NEXT INST W/ 663
1015  003532  106767  007550             4$:     MFPS    STATUS
1016  003536  016706  007544             MOV     STATUS,SP
1017  003542  042706  000017             BIC     #17,SP
1018  003546  022706  000340             CMP     #340,SP
1019  003552  001405                     BEQ     TST17
1020  003554  012737  000073  000402     MOV     #73,@#$FATAL    ;MOVE TO MAILBOX #  *******  73  *******
1021  003562  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1022  003564  000000                     HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
1023                                                    ; TO SCOPE REPLACE HALT W/ 240
1024                                                    ; AND REPLACE NEXT INST W/ 645
```

```
1025
1026                                    ;*****************************************************************************
1027                                    ;TEST 17 THAT ALL COMBINATION OF 'TRAP' WILL TRAP
1028                                    ;*****************************************************************************
1029  003566  005237  000404           TST17:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1030  003572  022737  000017  000404           CMP     #17,@#$TESTN    ;SEQUENCE ERROR?
1031  003600  001011                   BNE     RB1AA           ;BR TO ERROR HALT ON SEQ ERROR
1032  003602  012767  104400  000012   MOV     #TRAP,RB1       ;INITIALIZE BASE TRAP INSTRUCTION
1033  003610  012767  003636  174216   MOV     #RA1,34         ;RETURN FROM TRAP TO RA1
1034  003616  012706  000500           RC1:    MOV     #BUFF,SP        ;SET UP STACK POINTER
1035  003622  104400                   RB1:    TRAP                    ;TRAP INST WILL BE MODIFIED TO TRAP+377
1036  003624                           RB1AA:
1037  003624  012737  000074  000402           MOV     #74,@#$FATAL    ;MOVE TO MAILBOX    *******  74  *******
1038  003632  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1039  003634  000000                   HALT                    ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TESTN
1040                                                            ; TO SCOPE REPLACE HALT W/ 240
1041                                                            ; AND REPLACE NEXT INST W/ 761
1042  003636  005267  177760           RA1:    INC     RB1
1043  003642  022767  104777  177752           CMP     #104777,RB1     ;TRAP+377 TO UPPER LIMIT
1044  003650  103362                   BHIS    RC1             ;HAVE WE TESTED ALL
1045  003652  012767  000036  174154           MOV     #36,34
1046  003660  005067  174152           CLR     36
1047                                    ;*****************************************************************************
1048                                    ;TEST 20  THAT A TRAP OCCURES ON AN ''IOT'' INSTRUCTION
1049                                    ;*****************************************************************************
1050  003664  005237  000404           TST20:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1051  003670  022737  000020  000404           CMP     #20,@#$TESTN    ;SEQUENCE ERROR?
1052  003676  001006                   BNE     TST21-12        ;BR TO ERROR HALT ON SEQ ERROR
1053  003700  012706  000500           MOV     #BUFF,SP        ;STACK POINTER SETUP
1054  003704  012767  003726  174106   MOV     #RETA2,RTRAP2   ;RETURN LOCATION
1055  003712  000004                   IOT                     ;RESERVE INSTRUCTION, SHOULD TRAP
1056  003714  012737  000075  000402           MOV     #75,@#$FATAL    ;MOVE TO MAILBOX #  *******  75  *******
1057  003722  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1058  003724  000000                   HALT                    ;IOT DID NOT TRAP,OR WRONG $TESTN
1059                                                            ; TO SCOPE REPLACE HALT W/ 240
1060                                                            ; AND REPLACE NEXT INST W/ 764
1061  003726                           RETA2:
1062                                    ;*****************************************************************************
1063                                    ;TEST 21  DECREMENT OF STACK POINTER ON A TRAP OPERATION
1064                                    ;*****************************************************************************
1065  003726  005237  000404           TST21:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1066  003732  022737  000021  000404           CMP     #21,@#$TESTN    ;SEQUENCE ERROR?
1067  003740  001011                   BNE     TST22-12        ;BR TO ERROR HALT ON SEQ ERROR
1068  003742  012706  000500           MOV     #BUFF,SP        ;STACK POINTER SETUP
1069  003746  012767  003756  174044   MOV     #RETB2,RTRAP2   ;RETURN POINTER
1070  003754  000004                   IOT                     ;RESERVED INSTRUCTION
1071  003756  020627  000474           RETB2:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
1072  003762  001405                   BEQ     TST22
1073  003764  012737  000076  000402           MOV     #76,@#$FATAL    ;MOVE TO MAILBOX #  *******  76  *******
1074  003772  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1075  003774  000000                   HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
1076                                                            ; TO SCOPE REPLACE HALT W/ 240
1077                                                            ; AND REPLACE NEXT INST W/ 761
```

```
1078
1079                                    ;*****************************************************************************
1080                                    ;TEST 22  THAT PROPER P.C. IS SAVED
1081                                    ;*****************************************************************************
1082  003776  005237  000404           TST22:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1083  004002  022737  000022  000404           CMP     #22,@#$TESTN    ;SEQUENCE ERROR?
1084  004010  001012                          BNE     TST23-12        ;BR TO ERROR HALT ON SEQ ERROR
1085  004012  012706  000500                  MOV     #BUFF,SP        ;STACK POINTER SETUP
1086  004016  012767  004026  173774          MOV     #RETC2,RTRAP2   ;RETURN FROM TRAP POINTER
1087  004024  000004                          IOT                     ;TRAP ON THIS INSTRUCTION
1088  004026  022767  004026  174440  RETC2:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
1089  004034  001405                          BEQ     TST23
1090  004036  012737  000077  000402          MOV     #77,@#$FATAL    ;MOVE TO MAILBOX #  *******  77  *******
1091  004044  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1092  004046  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TESTN
1093                                                                  ; TO SCOPE REPLACE HALT W/ 240
1094                                                                  ; AND REPLACE NEXT INST W/ 760
1095                                    ;*****************************************************************************
1096                                    ;TEST 23  THAT 'OLD' STATUS AND PRIORITY ARE PLACED ON STACK
1097                                    ;*****************************************************************************
1098  004050  005237  000404           TST23:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1099  004054  022737  000023  000404           CMP     #23,@#$TESTN    ;SEQUENCE ERROR?
1100  004062  001044                          BNE     TST24-12        ;BR TO ERROR HALT ON SEQ ERROR
1101  004064  012706  000500                  MOV     #BUFF,SP        ;SET UP
1102  004070  012767  004112  173722          MOV     #RETD2,RTRAP2   ;SET UP
1103  004076  005067  007204                  CLR     STATUS          ;CLEAR STATUS AND PRIORITY
1104  004102  106467  007200                  MTPS    STATUS
1105  004106  000257                          CCC
1106  004110  000004                          IOT                     ;TRAP
1107  004112  026727  174360  000000  RETD2:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
1108  004120  001405                          BEQ     1$
1109  004122  012737  000100  000402          MOV     #100,@#$FATAL   ;MOVE TO MAILBOX #  *******  100  *******
1110  004130  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1111  004132  000000                          HALT                    ;INCORRECT STATUS
1112                                                                  ; TO SCOPE REPLACE HALT W/ 240
1113                                                                  ; AND REPLACE NEXT INST W/ 753
1114  004134  012706  000500           1$:     MOV     #BUFF,SP        ;SET UP
1115  004140  012767  004164  173652          MOV     #RETE2,RTRAP2   ;SET UP
1116  004146  012767  000357  007132          MOV     #357,STATUS             ;SET PRIORITY
1117  004154  106467  007126                  MTPS    STATUS
1118  004160  000277                          SCC                     ;SET CC
1119  004162  000004                          IOT                     ;TRAP
1120  004164  026727  174306  000357  RETE2:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
1121  004172  001405                          BEQ     TST24
1122  004174  012737  000101  000402          MOV     #101,@#$FATAL   ;MOVE TO MAILBOX #  *******  101  *******
1123  004202  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1124  004204  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
1125                                                                  ; TO SCOPE REPLACE HALT W/ 240
1126                                                                  ; AND REPLACE NEXT INST W/ 726
```

```
1127
1128                                    ;*****************************************************************************
1129                                    ;TEST 24  THAT 'NEW'' STATUS IS CORRECT
1130                                    ;*****************************************************************************
1131  004206  005237  000404   TST24:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1132  004212  022737  000024  000404   CMP     #24,@#$TESTN    ;SEQUENCE ERROR?
1133  004220  001125                   BNE     STP             ;BR TO ERROR HALT ON SEQ ERROR
1134  004222  012706  000500           MOV     #BUFF,SP
1135  004226  012767  004242  173564   MOV     #RETF2,RTRAP2
1136  004234  005067  173562           CLR     RTRAP2+2        ;CLEAR FUTURE PRIORITY AND CC
1137  004240  000004                   IOT
1138  004242                   RETF2:
1139  004242  100005                   BPL     1$
1140  004244  012737  000102  000402   MOV     #102,@#$FATAL   ;MOVE TO MAILBOX #  *******  102  *******
1141  004252  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1142  004254  000000                   HALT                    ;C NOT CLEARED
1143                                                           ; TO SCOPE REPLACE HALT W/ 240
1144                                                           ; AND REPLACE NEXT INST W/ 761
1145  004256                   1$:
1146  004256  001005                   BNE     2$
1147  004260  012737  000103  000402   MOV     #103,@#$FATAL   ;MOVE TO MAILBOX #  *******  103  *******
1148  004266  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1149  004270  000000                   HALT                    ;Z NOT CLEARED
1150                                                           ; TO SCOPE REPLACE HALT W/ 240
1151                                                           ; AND REPLACE NEXT INST W/ 753
1152  004272                   2$:
1153  004272  102005                   BVC     3$
1154  004274  012737  000104  000402   MOV     #104,@#$FATAL   ;MOVE TO MAILBOX #  *******  104  *******
1155  004302  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1156  004304  000000                   HALT                    ;V NOT CLEARED
1157                                                           ; TO SCOPE REPLACE HALT W/ 240
1158                                                           ; AND REPLACE NEXT INST W/ 745
1159  004306                   3$:     /
1160  004306  103005                   BCC     4$
1161  004310  012737  000105  000402   MOV     #105,@#$FATAL   ;MOVE TO MAILBOX #  *******  105  *******
1162  004316  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1163  004320  000000                   HALT                    ;C NOT CLEARED
1164                                    .                      ; TO SCOPE REPLACE HALT W/ 240
1165                                                           ; AND REPLACE NEXT INST W/ 737
1166  004322  106767  006760   4$:     MFPS    STATUS
1167  004326  032767  000340  006752   BIT     #340,STATUS             ;TEST PRIORITY
1168  004334  001405                   BEQ     5$
1169  004336  012737  000106  000402   MOV     #106,@#$FATAL   ;MOVE TO MAILBOX #  *******  106  *******
1170  004344  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1171  004346  000000                   HALT                    ;PRIORITY NOT ZERO
1172                                                           ; TO SCOPE REPLACE HALT W/ 240
1173                                                           ; AND REPLACE NEXT INST W/ 724
1174  004350  012706  000500   5$:     MOV     #BUFF,SP
1175  004354  012767  004372  173436   MOV     #RETG2,RTRAP2
1176  004362  012767  000357  173432   MOV     #357,RTRAP2+2   ;SET NEW ''CC'' AND PRIORITY
1177  004370  000004                   IOT                     ;TRAP HERE
1178  004372                   RETG2:
1179  004372  100405                   BMI     1$
1180  004374  012737  000107  000402   MOV     #107,@#$FATAL   ;MOVE TO MAILBOX #  *******  107  *******
1181  004402  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1182  004404  000000                   HALT                    ;N NOT SET
```

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1183                                                    ; TO SCOPE REPLACE HALT W/ 240
1184                                                    ; AND REPLACE NEXT INST W/ 705
1185  004406                            1$:
1186  004406  001405                         BEQ     2$
1187  004410  012737  000110  000402         MOV     #110,@#$FATAL   ;MOVE TO MAILBOX #  *******  110  *******
1188  004416  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1189  004420  000000                         HALT                    ;Z NOT SET
1190                                                    ; TO SCOPE REPLACE HALT W/ 240
1191                                                    ; AND REPLACE NEXT INST W/ 677
1192  004422                            2$:
1193  004422  102405                         BVS     3$
1194  004424  012737  000111  000402         MOV     #111,@#$FATAL   ;MOVE TO MAILBOX #  *******  111  *******
1195  004432  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1196  004434  000000                         HALT                    ;V NOT SET
1197                                                    ; TO SCOPE REPLACE HALT W/ 240
1198                                                    ; AND REPLACE NEXT INST W/ 671
1199  004436                            3$:
1200  004436  103405                         BCS     4$
1201  004440  012737  000112  000402         MOV     #112,@#$FATAL   ;MOVE TO MAILBOX #  *******  112  *******
1202  004446  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1203  004450  000000                         HALT                    ;C NOT SET
1204                                                    ; TO SCOPE REPLACE HALT W/ 240
1205                                                    ; AND REPLACE NEXT INST W/ 663
1206  004452  106767  006630           4$:   MFPS    STATUS
1207  004456  016706  006624                 MOV     STATUS,SP
1208  004462  042706  000017                 BIC     #17,SP
1209  004466  022706  000340                 CMP     #340,SP
1210  004472  001405                         BEQ     STPA
1211  004474                            STP:
1212  004474  012737  000113  000402         MOV     #113,@#$FATAL   ;MOVE TO MAILBOX #  *******  113  *******
1213  004502  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1214  004504  000000                         HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
1215                                                    ; TO SCOPE REPLACE HALT W/ 240
1216                                                    ; AND REPLACE NEXT INST W/ 645
1217  004506  012767  000022  173304  STPA:  MOV     #22,20
1218  004514  005067  173302                 CLR     22
```

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1219
1220                                    ;*************************************************************************
1221                                    ;TEST 25 THAT TRAP OCCURS ON AN EMT RESTRICTED INSTRUCTION
1222                                    ;************************************************************************
1223  004520  005237  000404           TST25:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1224  004524  022737  000025  000404           CMP     #25,@#$TESTN    ;SEQUENCE ERROR?
1225  004532  001006                   BNE     TST26-12        ;BR TO ERROR HALT ON SEQ ERROR
1226  004534  012706  000500           MOV     #BUFF,SP        ;STACK POINTER SETUP
1227  004540  012767  004562  173262   MOV     #RETA3,RTRAP3   ;RETURN LOCATION
1228  004546  104000                   EMT                     ;RESERVE INSTRUCTIOM, SHOULD TRAP
1229  004550  012737  000114  000402   MOV     #114,@#$FATAL   ;MOVE TO MAILBOX #  *******  114  *******
1230  004556  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1231  004560  000000                   HALT                    ;EMT DID NOT TRAP,OR WRONG $TESTN
1232                                                            ; TO SCOPE REPLACE HALT W/ 240
1233                                                            ; AND REPLACE NEXT INST W/ 764
1234  004562                           RETA3:
1235                                    ;*************************************************************************
1236                                    ;TEST 26  DECREMENT OF STACK POINTER ON A TRAP OPERATION
1237                                    ;*************************************************************************
1238  004562  005237  000404           TST26:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1239  004566  022737  000026  000404           CMP     #26,@#$TESTN    ;SEQUENCE ERROR?
1240  004574  001011                   BNE     TST27-12        ;BR TO ERROR HALT ON SEQ ERROR
1241  004576  012706  000500           MOV     #BUFF,SP        ;STACK POINTER SETUP
1242  004602  012767  004612  173220   MOV     #RETB3,RTRAP3   ;RETURN POINTER
1243  004610  104000                   EMT                     ;RESERVED INSTRUCTION
1244  004612  020627  000474           RETB3:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
1245  004616  001405                   BEQ     TST27
1246  004620  012737  000115  000402   MOV     #115,@#$FATAL   ;MOVE TO MAILBOX #  *******  115  *******
1247  004626  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1248  004630  000000                   HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
1249                                                            ; TO SCOPE REPLACE HAL     240
1250                                                            ; AND REPLACE NEXT INST W/ 761
1251                                    ;*************************************************************************
1252                                    ;TEST 27  THAT PROPER P.C. IS SAVED
1253                                    ;*************************************************************************
1254  004632  005237  000404           TST27:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1255  004636  022737  000027  000404           CMP     #27,@#$TESTN    ;SEQUENCE ERROR?
1256  004644  001012                   BNE     TST30-12        ;BR TO ERROR HALT ON SEQ ERROR
1257  004646  012706  000500           MOV     #BUFF,SP        ;STACK POINTER SETUP
1258  004652  012767  004662  173150   MOV     #RETC3,RTRAP3   ;RTURN FROM TRAP POINTER
1259  004660  104000                   EMT                     ;TRAP ON THIS INSTRICTION
1260  004662  022767  004662  173604   RETC3:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
1261  004670  001405                   BEQ     TST30
1262  004672  012737  000116  000402   MOV     #116,@#$FATAL   ;MOVE TO MAILBOX #  *******  116  *******
1263  004700  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1264  004702  000000                   HALT                    ;INCORRECT P.C.,OR WRONG $TESTN
1265                                                            ; TO SCOPE REPLACE HALT W/ 240
1266                                                            ; AND REPLACE NEXT INST W/ 760
```

```
1267
1268                                    ;*****************************************************************************
1269                                    ;TEST 30  THAT 'OLD'' STATUS AND PRIORITY ARE PLACED ON STACK
1270                                    ;*****************************************************************************
1271  004704  005237  000404           TST30:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1272  004710  022737  000030  000404           CMP     #30,@#$TESTN    ;SEQUENCE ERROR?
1273  004716  001044                   BNE     TST31-12        ;BR TO ERROR HALT ON SEQ ERROR
1274  004720  012706  000500           MOV     #BUFF,SP        ;SET UP
1275  004724  012767  004746  173076   MOV     #RETD3,RTRAP3   ;SET UP
1276  004732  005067  006350           CLR     STATUS          ;CLEAR STATUS AND PRIORITY
1277  004736  106467  006344           MTPS    STATUS
1278  004742  000257                   CCC
1279  004744  104000                   EMT                     ;TRAP
1280  004746  026727  173524  000000   RETD3:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
1281  004754  001405                   BEQ     1$
1282  004756  012737  000117  000402           MOV     #117,@#$FATAL   ;MOVE TO MAILBOX #  *******  117  *******
1283  004764  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1284  004766  000000                   HALT                    ;INCORRECT STATUS
1285                                                            ; TO SCOPE REPLACE HALT W/ 240
1286                                                            ; AND REPLACE NEXT INST W/ 753
1287  004770  012706  000500           1$:     MOV     #BUFF,SP        ;SET UP
1288  004774  012767  005020  173026           MOV     #RETE3,RTRAP3   ;SET UP
1289  005002  012767  000357  006276           MOV     #357,STATUS             ;SET PRIORITY
1290  005010  106467  006272                   MTPS    STATUS
1291  005014  000277                   SCC                     ;SET CC
1292  005016  104000                   EMT                     ;TRAP
1293  005020  026727  173452  000357   RETE3:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
1294  005026  001405                   BEQ     TST31
1295  005030  012737  000120  000402           MOV     #120,@#$FATAL   ;MOVE TO MAILBOX #  *******  120  *******
1296  005036  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1297  005040  000000                   HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
1298                                                            ; TO SCOPE REPLACE HALT W/ 240
1299                                                            ; AND REPLACE NEXT INST W/ 726
```

```
1300
1301                                    ;*****************************************************************************
1302                                    ;TEST 31  THAT 'NEW' STATUS IS CORRECT
1303                                    ;*****************************************************************************
1304  005042  005237  000404     TST31: INC     @#$TESTN        ;UPDATE TEST NUMBER
1305  005046  022737  000031  000404    CMP     #31,@#$TESTN    ;SEQUENCE ERROR?
1306  005054  001125                    BNE     TST32-12        ;BR TO ERROR HALT ON SEQ ERROR
1307  005056  012706  000500            MOV     #BUFF,SP
1308  005062  012767  005076  172740    MOV     #RETF3,RTRAP3
1309  005070  005067  172736            CLR     RTRAP3+2        ;CLEAR FUTURE PRIORITY AND CC
1310  005074  104000                    EMT
1311  005076                     RETF3:                         ;TEST FOR "C" CLEARED
1312  005076  100005                    BPL     1$
1313  005100  012737  000121  000402    MOV     #121,@#$FATAL   ;MOVE TO MAILBOX #  *******  121  *******
1314  005106  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1315  005110  000000                    HALT                    ;C NOT CLEARED
1316                                                            ; TO SCOPE REPLACE HALT W/ 240
1317                                                            ; AND REPLACE NEXT INST W/ 761
1318  005112                     1$:
1319  005112  001005                    BNE     2$
1320  005114  012737  000122  000402    MOV     #122,@#$FATAL   ;MOVE TO MAILBOX #  *******  122  *******
1321  005122  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1322  005124  000000                    HALT                    ;Z NOT CLEARED
1323                                                            ; TO SCOPE REPLACE HALT W/ 240
1324                                                            ; AND REPLACE NEXT INST W/ 753
1325  005126                     2$:
1326  005126  102005                    BVC     3$
1327  005130  012737  000123  000402    MOV     #123,@#$FATAL   ;MOVE TO MAILBOX #  *******  123  *******
1328  005136  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1329  005140  000000                    HALT                    ;V NOT CLEARED
1330                                                            ; TO SCOPE REPLACE HALT W/ 240
1331                                                            ; AND REPLACE NEXT INST W/ 745
1332  005142                     3$:
1333  005142  103005                    BCC     4$
1334  005144  012737  000124  000402    MOV     #124,@#$FATAL   ;MOVE TO MAILBOX #  *******  124  *******
1335  005152  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1336  005154  000000                    HALT                    ;C NOT CLEARED
1337                                                            ; TO SCOPE REPLACE HALT W/ 240
1338                                                            ; AND REPLACE NEXT INST W/ 737
1339  005156  106767  006124     4$:    MFPS    STATUS
1340  005162  032767  000340  006116    BIT     #340,STATUS             ;TEST PRIORITY
1341  005170  001405                    BEQ     5$
1342  005172  012737  000125  000402    MOV     #125,@#$FATAL   ;MOVE TO MAILBOX #  *******  125  *******
1343  005200  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1344  005202  000000                    HALT                    ;PRIORITY NOT ZERO
1345                                                            ; TO SCOPE REPLACE HALT W/ 240
1346                                                            ; AND REPLACE NEXT INST W/ 724
1347  005204  012706  000500     5$:    MOV     #BUFF,SP
1348  005210  012767  005226  172612    MOV     #RETG3,RTRAP3
1349  005216  012767  000357  172606    MOV     #357,RTRAP3+2   ;SET NEW "CC" AND PRIORITY
1350  005224  104000                    EMT                     ;TRAP HERE
1351  005226                     RETG3:
1352  005226  100405                    BMI     1$
1353  005230  012737  000126  000402    MOV     #126,@#$FATAL   ;MOVE TO MAILBOX #  *******  126  *******
1354  005236  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1355  005240  000000                    HALT                    ;N NOT SET
```

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1356                                                    ; TO SCOPE REPLACE HALT W/ 240
1357                                                    ; AND REPLACE NEXT INST W/ 705
1358  005242                                1$:
1359  005242  001405                             BEQ     2$
1360  005244  012737  000127  000402            MOV     #127,@#$FATAL   ;MOVE TO MAILBOX #  *******  127  *******
1361  005252  005212                             INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1362  005254  000000                      -      HALT                    ;Z NOT SET
1363                                                    ; TO SCOPE REPLACE HALT W/ 240
1364                                                    ; AND REPLACE NEXT INST W/ 677
1365  005256                                2$:
1366  005256  102405                             BVS     3$
1367  005260  012737  000130  000402            MOV     #130,@#$FATAL   ;MOVE TO MAILBOX #  *******  130  *******
1368  005266  005212                             INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1369  005270  000000                             HALT                    ;V NOT SET
1370                                                    ; TO SCOPE REPLACE HALT W/ 240
1371                                                    ; AND REPLACE NEXT INST W/ 671
1372  005272                                3$:
1373  005272  103405                             BCS     4$
1374  005274  012737  000131  000402            MOV     #131,@#$FATAL   ;MOVE TO MAILBOX #  *******  131  *******
1375  005302  005212                             INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1376  005304  000000                             HALT                    ;C NOT SET
1377                                                    ; TO SCOPE REPLACE HALT W/ 240
1378                                                    ; AND REPLACE NEXT INST W/ 663
1379  005306  106767  005774           4$:       MFPS    STATUS
1380  005312  016706  005770                     MOV     STATUS,SP
1381  005316  042706  000017                     BIC     #17,SP
1382  005322  022706  000340                     CMP     #340,SP
1383  005326  001405                             BEQ     TST32
1384  005330  012737  000132  000402            MOV     #132,@#$FATAL   ;MOVE TO MAILBOX #  *******  132  *******
1385  005336  005212                             INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1386  005340  000000                             HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
1387                                                    ; TO SCOPE REPLACE HALT W/ 240
1388                                                    ; AND REPLACE NEXT INST W/ 645
```

```
1389
1390                                    ;*****************************************************************************
1391                                    ;TEST 32 THAT ALL COMBINATION OF EMT WILL CAUSE A TRAP
1392                                    ;*****************************************************************************
1393  005342  005237  000404     TST32: INC     @#$TESTN          ;UPDATE TEST NUMBER
1394  005346  022737  000032  000404    CMP     #32,@#$TESTN      ;SEQUENCE ERROR?
1395  005354  001011                    BNE     RBBB              ;BR TO ERROR HALT ON SEQ ERROR
1396  005356  012767  104000  000012    MOV     #EMT,RB           ;INITIALIZE BASE EMT INSTRUCTION
1397  005364  012767  005412  172436    MOV     #RA,30            ;RETURN FROM TRAP TO RA
1398  005372  012706  000500     RC:    MOV     #BUFF,SP          ;SET UP STACK POINTER
1399  005376  104000              RB:    EMT                       ;TRAP INST. WILL BE MODIFIED TO EMT+377
1400  005400                      RBBB:
1401  005400  012737  000133  000402    MOV     #133,@#$FATAL     ;MOVE TO MAILBOX #  *******  133  *******
1402  005406  005212                    INC     (R2)              ;SET MSGTYP TO FATAL ERROR
1403  005410  000000                    HALT                      ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TESTN
1404                                                              ; TO SCOPE REPLACE HALT W/ 240
1405                                                              ; AND REPLACE NEXT INST W/ 761
1406  005412  005267  177760     RA:    INC     RB
1407  005416  022767  104377  177752    CMP     #104377,RB        ;EMT+377 TO EMT?
1408  005424  103362                    BHIS    RC                ;HAVE WE TESTED ALL
1409  005426  012767  000032  172374    MOV     #32,30
1410  005434  005067  172372            CLR     32                ;HALT
1411                                    ;*****************************************************************************
1412                                    ;TEST 33 THAT A TRAP OCCURES ON AN 'BPT' INSTRUCTION
1413                                    ;*****************************************************************************
1414  005440  005237  000404     TST33: INC     @#$TESTN          ;UPDATE TEST NUMBER
1415  005444  022737  000033  000404    CMP     #33,@#$TESTN      ;SEQUENCE ERROR?
1416  005452  001006                    BNE     TST34-12          ;BR TO ERROR HALT ON SEQ ERROR
1417  005454  012706  000500            MOV     #BUFF,SP          ;STACK POINTER SETUP
1418  005460  012767  005502   /2326    MOV     #RETA4,RTRAP4     ;RETURN LOCATION
1419  005466  000003                    TRT                       ;RESERVED INSTRUCTION, SHOULD TRAP
1420  005470  012737  000134  000402    MOV     #134,@#$FATAL     ;MOVE TO MAILBOX #  *******  134  *******
1421  005476  005212                    INC     (R2)              ;SET MSGTYP TO FATAL ERROR
1422  005500  000000                    HALT                      ;DID NOT TRAP,OR WRONG $TESTN
1423                                                              ; TO SCOPE REPLACE HALT W/ 240
1424                                                              ; AND REPLACE NEXT INST W/ 764
1425  005502                      RETA4.
```

```
1426
1427                                    ;*****************************************************************************
1428                                    ;TEST 34 DECREMENT OF STACK POINTER ON A TRAP OPERATION
1429                                    ;*****************************************************************************
1430  005502  005237  000404           TST34:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1431  005506  022737  000034  000404           CMP     #34,@#$TESTN    ;SEQUENCE ERROR?
1432  005514  001011                           BNE     TST35-12        ;BR TO ERROR HALT ON SEQ ERROR
1433  005516  012706  000500                   MOV     #BUFF,SP        ;STACK POINTER SETUP
1434  005522  012767  005532  172264           MOV     #RETB4,RTRAP4   ;RETURN POINTER
1435  005530  000003                           TRT                     ;RESERVED INSTRUCTION
1436  005532  020627  000474           RETB4:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
1437  005536  001405                           BEQ     TST35
1438  005540  012737  000135  000402           MOV     #135,@#$FATAL   ;MOVE TO MAILBOX #  *******  135  *******
1439  005546  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1440  005550  000000                           HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
1441                                                                   ; TO SCOPE REPLACE HALT W/ 240
1442                                                                   ; AND REPLACE NEXT INST W/ 761
1443                                    ;*****************************************************************************
1444                                    ;TEST 35 THAT PROPER P.C. IS SAVED
1445                                    ;*****************************************************************************
1446  005552  005237  000404           TST35:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1447  005556  022737  000035  000404           CMP     #35,@#$TESTN    ;SEQUENCE ERROR?
1448  005564  001012                           BNE     TST36-12        ;BR TO ERROR HALT ON SEQ ERROR
1449  005566  012706  000500                   MOV     #BUFF,SP        ;STACK POINTER SETUP
1450  005572  012767  005602  172214           MOV     #RETC4,RTRAP4   ;RETURN FROM TRAP POINTER
1451  005600  000003                           TRT                     ;TRAP ON THIS INSTRUCTION
1452  005602  022767  005602  172664  RETC4:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
1453  005610  001405                           BEQ     TST36
1454  005612  012737  000136  000402           MOV     #136,@#$FATAL   ;MOVE TO MAILBOX #  *******  136  *******
1455  005620  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1456  005622  000000                           HALT                    ;INCORRECT P.C.,OR WRONG $TESTN
1457                                                                   ; TO SCOPE REPLACE HALT W/ 240
1458                                                                   ; AND REPLACE NEXT INST W/ 760
```

```
1459
1460                                    ;*****************************************************************************
1461                                    ;TEST 36 THAT 'OLD' STATUS AND PRIORITY ARE PLACED ON STACK
1462                                    ;*****************************************************************************
1463  005624  005237  000404      TST36:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1464  005630  022737  000036  000404      CMP     #36,@#$TESTN    ;SEQUENCE ERROR?
1465  005636  001044                      BNE     TST37-12        ;BR TO ERROR HALT ON SEQ ERROR
1466  005640  012706  000500              MOV     #BUFF,SP        ;SET UP
1467  005644  012767  005666  172142      MOV     #RETD4,RTRAP4   ;SET UP
1468  005652  005067  005430              CLR     STATUS          ;CLEAR STATUS AND PRIORITY
1469  005656  106467  005424              MTPS    STATUS
1470  005662  000257                      CCC
1471  005664  000003                      TRT                     ;TRAP
1472  005666  026727  172604  000000  RETD4:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
1473  005674  001405                      BEQ     1$
1474  005676  012737  000137  000402      MOV     #137,@#$FATAL   ;MOVE TO MAILBOX #  *******  137  *******
1475  005704  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1476  005706  000000                      HALT                    ;INCORRECT STATUS
1477                                                              ; TO SCOPE REPLACE HALT W/ 240
1478                                                              ; AND REPLACE NEXT INST W/ 753
1479  005710  012706  000500      1$:     MOV     #BUFF,SP        ;SET UP
1480  005714  012767  005740  172072      MOV     #RETE4,RTRAP4   ;SET UP
1481  005722  012767  000357  005356      MOV     #357,STATUS             ;SET PRIORITY
1482  005730  106467  005352              MTPS    STATUS
1483  005734  000277                      SCC                     ;SET-SET CC
1484  005736  000003                      TRT                     ;TRAP
1485  005740  026727  172532  000357  RETE4:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
1486  005746  001405                      BEQ     TST37
1487  005750  012737  000140  000402      MOV     #140,@#$FATAL   ;MOVE TO MAILBOX #  *******  140  *******
1488  005756  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1489  005760  000000                      HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
1490                                                              ; TO SCOPE REPLACE HALT W/ 240
1491                                                              ; AND REPLACE NEXT INST W/ 726
```

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1492
1493                                    ;*****************************************************************************
1494                                    ;TEST 37 THAT 'NEW'' STATUS IS CORRECT
1495                                    ;*****************************************************************************
1496  005762  005237  000404    TST37:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1497  005766  022737  000037  000404    CMP     #37,@#$TESTN    ;SEQUENCE ERROR?
1498  005774  001125                    BNE     RSTP2           ;BR TO ERROR HALT ON SEQ ERROR
1499  005776  012706  000500            MOV     #BUFF,SP
1500  006002  012767  006016  172004    MOV     #RETF4,RTRAP4
1501  006010  005067  172002            CLR     RTRAP4+2        ;CLEAR FUTURE PRIORITY AND CC
1502  006014  000003                    TRT
1503  006016                    RETF4:
1504  006016  100005                    BPL     1$
1505  006020  012737  000141  000402    MOV     #141,@#$FATAL   ;MOVE TO MAILBOX #  *******  141  *******
1506  006026  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1507  006030  000000                    HALT                    ;C NOT CLEARED
1508                                                            ; TO SCOPE REPLACE HALT W/ 240
1509                                                            ; AND REPLACE NEXT INST W/ 761
1510  006032                    1$:
1511  006032  001005                    BNE     2$
1512  006034  012737  000142  000402    MOV     #142,@#$FATAL   ;MOVE TO MAILBOX #  *******  142  *******
1513  006042  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1514  006044  000000                    HALT                    ;Z NOT CLEARED
1515                                                            ; TO SCOPE REPLACE HALT W/ 240
1516                                                            ; AND REPLACE NEXT INST W/ 753
1517  006046                    2$:
1518  006046  102005                    BVC     3$
1519  006050  012737  000143  000402    MOV     #143,@#$FATAL   ;MOVE TO MAILBOX #  *******  143  *******
1520  006056  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1521  006060  000000                    HALT                    ;V NOT CLEARED
1522                                                            ; TO SCOPE REPLACE HALT W/ 240
1523                                                            ; AND REPLACE NEXT INST W/ 745
1524  006062                    3$:
1525  006062  103005                    BCC     4$
1526  006064  012737  000144  000402    MOV     #144,@#$FATAL   ;MOVE TO MAILBOX #  *******  144  *******
1527  006072  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1528  006074  000000                    HALT                    ;C NOT CLEARED
1529                                                            ; TO SCOPE REPLACE HALT W/ 240
1530                                                            ; AND REPLACE NEXT INST W/ 737
1531  006076  106767  005204    4$:     MFPS    STATUS
1532  006102  032767  000340  005176    BIT     #340,STATUS             ;TEST PRIORITY
1533  006110  001405                    BEQ     5$
1534  006112  012737  000145  000402    MOV     #145,@#$FATAL   ;MOVE TO MAILBOX #  *******  145  *******
1535  006120  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1536  006122  000000                    HALT                    ;PRIORITY NOT ZERO
1537                                                            ; TO SCOPE REPLACE HALT W/ 240
1538                                                            ; AND REPLACE NEXT INST W/ 724
1539  006124  012706  000500    5$:     MOV     #BUFF,SP
1540  006130  012767  006146  171656    MOV     #RETG4,RTRAP4
1541  006136  012767  000357  171652    MOV     #357,RTRAP4+2   ;SET 'NEW' 'CC'' AND PRIORITY
1542  006144  000003                    TRT                     ;TRAP HERE
1543  006146                    RETG4:
1544  006146  100405                    BMI     1$
1545  006150  012737  000146  000402    MOV     #146,@#$FATAL   ;MOVE TO MAILBOX #  *******  146  *******
1546  006156  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1547  006160  000000                    HALT                    ;N NOT SET
```

```
 1548                                                                   ; TO SCOPE REPLACE HALT W/ 240
 1549                                                                   ; AND REPLACE NEXT INST W/ 705
 1550  006162                                  1$:
 1551  006162  001405                                 BEQ     2$
 1552  006164  012737  000147  000402                 MOV     #147,@#$FATAL   ;MOVE TO MAILBOX #  *******  147  *******
 1553  006172  005212                                 INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 1554  006174  000000                                 HALT                    ;Z NOT SET
 1555                                                                   ; TO SCOPE REPLACE HALT W/ 240
 1556                                                                   ; AND REPLACE NEXT INST W/ 677
 1557  006176                                  2$:
 1558  006176  102405                                 BVS     3$
 1559  006200  012737  000150  000402                 MOV     #150,@#$FATAL   ;MOVE TO MAILBOX #  *******  150  *******
 1560  006206  005212                                 INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 1561  006210  000000                                 HALT                    ;V NOT SET
 1562                                                                   ; TO SCOPE REPLACE HALT W/ 240
 1563                                                                   ; AND REPLACE NEXT INST W/ 671
 1564  006212                                  3$:
 1565  006212  103405                                 BCS     4$
 1566  006214  012737  000151  000402                 MOV     #151,@#$FATAL   ;MOVE TO MAILBOX #  *******  151  *******
 1567  006222  005212                                 INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 1568  006224  000000                                 HALT                    ;C NOT SET
 1569                                                                   ; TO SCOPE REPLACE HALT W/ 240
 1570                                                                   ; AND REPLACE NEXT INST W/ 663
 1571  006226  106767  005054          4$:    MFPS    STATUS
 1572  006232  016706  005050                 MOV     STATUS,SP
 1573  006236  042706  000017                 BIC     #17,SP
 1574  006242  022706  000340                 CMP     #340,SP
 1575  006246  001405                         BEQ     RST2
 1576  006250                          RSTP2:
 1577  006250  012737  000152  000402                 MOV     #152,@#$FATAL   ;MOVE TO MAILBOX #  *******  152  *******
 1578  006256  005212                                 INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 1579  006260  000000                                 HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
 1580                                                                   ; TO SCOPE REPLACE HALT W/ 240
 1581                                                                   ; AND REPLACE NEXT INST W/ 645
 1582  006262  012767  000016  171524  RST2:  MOV     #16,14
 1583  006270  005067  171522                 CLR     16
 1584
```

```
1585
1586                                    ;PDP-11 ILLEGAL AND ADDRESS INSTRUCTION TEST
1587                                    ;ALL INSTRUCTIONS THAT ARE RESERVED
1588                                    ;SHOULD TRAP TO LOCATION 4, AND THE
1589                                    ;PC THAT POINTS TO THE TRAPPING INSTRUCTION
1590                                    ;SHOULD BE PLACED ON THE STACK
1591
1592                                    ;*************************************************************************************
1593                                    ;TEST 40 THAT A TRAP OCCURS ON AN ILLEGAL INSTRUCTION
1594                                    ;*************************************************************************************
1595  006274  005237  000404            TST40:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1596  006300  022737  000040  000404            CMP     #40,@#$TESTN    ;SEQUENCE ERROR?
1597  006306  001006                    BNE     TST41-12        ;BR TO ERROR HALT ON SEQ ERROR
1598  006310  012706  000500            MOV     #BUFF,SP        ;STACK POINTER SETUP
1599  006314  012767  006336  171462    MOV     #RETA5,RTRAP5   ;RETURN LOCATION
1600  006322  000100                    JMP     %0              ;ILLEGAL INSTRUCTION, SHOULD TRAP
1601  006324  012737  000153  000402    MOV     #153,@#$FATAL   ;MOVE TO MAILBOX #  *******  153  *******
1602  006332  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1603  006334  000000                    HALT                    ;DID NOT TRAP,OR WRONG $TESTN
1604                                                            ; TO SCOPE REPLACE HALT W/ 240
1605                                                            ; AND REPLACE NEXT INST W/ 764
1606  006336                            RETA5:
1607                                    ;*************************************************************************************
1608                                    ;TEST 41 DECREMENT OF STACK POINTER ON A TRAP OPERATION
1609                                    ;*************************************************************************************
1610  006336  005237  000404            TST41:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1611  006342  022737  000041  000404            CMP     #41,@#$TESTN    ;SEQUENCE ERROR?
1612  006350  001011                    BNE     TST42-12        ;BR TO ERROR HALT ON SEQ ERROR
1613  006352  012706  000500            MOV     #BUFF,SP        ;STACK POINTER SETUP
1614  006356  012767  006366  171420    MOV     #RETB5,RTRAP5   ;RETURN POINTER
1615  006364  000100                    JMP     %0              ;RESERVED INSTRUCTION
1616  006366  020627  000474            RETB5:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
1617  006372  001405                    BEQ     TST42
1618  006374  012737  000154  000402    MOV     #154,@#$FATAL   ;MOVE TO MAILBOX #  *******  154  *******
1619  006402  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1620  006404  000000                    HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
1621                                                            ; TO SCOPE REPLACE HALT W/ 240
1622                                                            ; AND REPLACE NEXT INST W/ 761
```

```
1623
1624                                    ;*****************************************************************************
1625                                    ;TEST 42 THAT PROPER P.C. IS SAVED
1626                                    ;*****************************************************************************
1627  006406  005237  000404           TST42:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1628  006412  022737  000042  000404           CMP     #42,@#$TESTN    ;SEQUENCE ERROR?
1629  006420  001012                           BNE     TST43-12        ;BR TO ERROR HALT ON SEQ ERROR
1630  006422  012706  000500                   MOV     #BUFF,SP        ;STACK POINTER SETUP
1631  006426  012767  006436  171350           MOV     #RETC5,RTRAP5   ;RETURN FROM TRAP POINTER
1632  006434  000100                           JMP     %0              ;TRAP ON THIS INSTRUCTION
1633  006436  022767  006436  172030  RETC5:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
1634  006444  001405                           BEQ     TST43
1635  006446  012737  000155  000402           MOV     #155,@#$FATAL   ;MOVE TO MAILBOX #  *******  155  *******
1636  006454  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1637  006456  000000                           HALT                    ;INCORRECT P.C.,OR WRONG $TESTN
1638                                                                   ; TO SCOPE REPLACE HALT W/ 240
1639                                                                   ; AND REPLACE NEXT INST W/ 760
1640                                    ;*****************************************************************************
1641                                    ;TEST 43 THAT 'OLD' STATUS AND PRIORITY ARE PLACED ON STACK
1642                                    ;*****************************************************************************
1643  006460  005237  000404           TST43:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1644  006464  022737  000043  000404           CMP     #43,@#$TESTN    ;SEQUENCE ERROR?
1645  006472  001044                           BNE     TST44-12        ;BR TO ERROR HALT ON SEQ ERROR
1646  006474  012706  000500                   MOV     #BUFF,SP        ;SET UP
1647  006500  012767  006522  171276           MOV     #RETD5,RTRAP5   ;SET UP
1648  006506  005067  004574                   CLR     STATUS          ;CLEAR STATUS AND PRIORITY
1649  006512  106467  004570                   MTPS    STATUS
1650  006516  000257                           CCC
1651  006520  000100                           JMP     %0              ;TRAP
1652  006522  026727  171750  000000  RETD5:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
1653  006530  001405                           BEQ     1$
1654  006532  012737  000156  000402           MOV     #156,@#$FATAL   ;MOVE TO MAILBOX #  *******  156  *******
1655  006540  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1656  006542  000000                           HALT                    ;INCORRECT STATUS
1657                                                                   ; TO SCOPE REPLACE HALT W/ 240
1658                                                                   ; AND REPLACE NEXT INST W/ 753
1659  006544  012706  000500           1$:     MOV     #BUFF,SP        ;SET UP
1660  006550  012767  006574  171226           MOV     #RETE5,RTRAP5   ;SET UP
1661  006556  012767  000357  004522           MOV     #357,STATUS             ;SET PRIORITY
1662  006564  106467  004516                   MTPS    STATUS
1663  006570  000277                           SCC                     ;SET CC
1664  006572  000100                           JMP     %0              ;TRAP
1665  006574  026727  171676  000357  RETE5:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
1666  006602  001405                           BEQ     TST44
1667  006604  012737  000157  000402           MOV     #157,@#$FATAL   ;MOVE TO MAILBOX #  *******  157  *******
1668  006612  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1669  006614  000000                           HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
1670                                                                   ; TO SCOPE REPLACE HALT W/ 240
1671                                                                   ; AND REPLACE NEXT INST W/ 726
```

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                                        ;*****************************************************************************
                                        ;TEST 44 THAT 'NEW'' STATUS IS CORRECT
                                        ;*****************************************************************************
006616  005237  000404          TST44:  INC     @#$TESTN        ;UPDATE TEST NUMBER
006622  022737  000044  000404          CMP     #44,@#$TESTN    ;SEQUENCE ERROR?
006630  001123                        BNE     TST45-12        ;BR TO ERROR HALT ON SEQ ERROR
006632  012706  000500                MOV     #BUFF,SP
006636  012767  006652  171140        MOV     #RETF5,RTRAP5
006644  005067  171136                CLR     RTRAP5+2        ;CLEAR FUTURE PRIORITY AND CC
006650  000100                        JMP     %0
006652                          RETF5:
006652  100005                        BPL     1$
006654  012737  000160  000402        MOV     #160,@#$FATAL   ;MOVE TO MAILBOX #  *******  160  *******
006662  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
006664  000000                        HALT                    ;C NOT CLEARED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 761
006666                          1$:
006666  001005                        BNE     2$
006670  012737  000161  000402        MOV     #161,@#$FATAL   ;MOVE TO MAILBOX #  *******  161  *******
006676  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
006700  000000                        HALT                    ;Z NOT CLEARED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 753
006702                          2$:
006702  102005                        BVC     3$
006704  012737  000162  000402        MOV     #162,@#$FATAL   ;MOVE TO MAILBOX #  *******  162  *******
006712  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
006714  000000                        HALT                    ;V NOT CLEARED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 745
006716                          3$:
006716  103005                        BCC     4$
006720  012737  000163  000402        MOV     #163,@#$FATAL   ;MOVE TO MAILBOX #  *******  163  *******
006726  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
006730  000000                        HALT                    ;C NOT CLEARED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 737
006732  106767  004350          4$:     MFPS    STATUS
006736  032767  000357  004342        BIT     #357,STATUS             ;TEST PRIORITY
006744  001405                        BEQ     5$
006746  012737  000164  000402        MOV     #164,@#$FATAL   ;MOVE TO MAILBOX #  *******  164  *******
006754  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
006756  000000                        HALT                    ;PRIORITY NOT ZERO
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 724
006760  012706  000500          5$:     MOV     #BUFF,SP
006764  012767  007002  171012        MOV     #RETG5,RTRAP5
006772  012767  000357  171006        MOV     #357,RTRAP5+2   ;SET NEW ''CC'' AND PRIORITY
007000  000100                        JMP     %0              ;TRAP HERE
007002                          RETG5:
007002  100405                        BMI     1$
007004  012737  000165  000402        MOV     #165,@#$FATAL   ;MOVE TO MAILBOX #  *******  165  *******
007012  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
007014  000000                        HALT                    ;N NOT SET
```

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                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 705
007016                                          1$:
007016  001405                                  BEQ     2$
007020  012737  000166  000402                  MOV     #166,@#$FATAL   ;MOVE TO MAILBOX #  *******  166  *******
007026  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
007030  000000                                  HALT                    ;Z NOT SET
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 677
007032                                          2$:
007032  102405                                  BVS     3$
007034  012737  000167  000402                  MOV     #167,@#$FATAL   ;MOVE TO MAILBOX #  *******  167  *******
007042  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
007044  000000                                  HALT                    ;V NOT SET
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 671
007046                                          3$:
007046  103405                                  BCS     4$
007050  012737  000170  000402                  MOV     #170,@#$FATAL   ;MOVE TO MAILBOX #  *******  170  *******
007056  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
007060  000000                                  HALT                    ;C NOT SET
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 663
007062  106767  004220                  4$:     MFPS    STATUS
007066  016706  004214                          MOV     STATUS,SP
007072  022706  000357                          CMP     #357,SP
007076  001405                                  BEQ     TST45
007100  012737  000171  000402                  MOV     #171,@#$FATAL   ;MOVE TO MAILBOX #  *******  171  *******
007106  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
007110  000000                                  HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 647
```

```
1760
1761                                    ;*****************************************************************************
1762                                    ;TEST 45 THAT A TRAP OCCURES ON ALL ILLEGAL INSTRUCION
1763                                    ;*****************************************************************************
1764  007112  005237  000404           TST45:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1765  007116  022737  000045  000404           CMP     #45,@#$TESTN    ;SEQUENCE ERROR?
1766  007124  001006                   BNE     TST46-12        ;BR TO ERROR HALT ON SEQ ERROR
1767  007126  012706  000500           MOV     #BUFF,SP        ;STACK POINTER SETUP
1768  007132  012767  007154  170644   MOV     #RETH5,RTRAP5   ;RETURN LOCATION
1769  007140  004000                   JSR     %0,%0           ;RESERVED INSTRUCTION, SHOULD TRAP
1770  007142  012737  000172  000402   MOV     #172,@#$FATAL   ;MOVE TO MAILBOX #  *******  172  *******
1771  007150  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1772  007152  000000                   HALT                    ;DID NOT TRAP,OR WRONG $TESTN
1773                                                            ; TO SCOPE REPLACE HALT W/ 240
1774                                                            ; AND REPLACE NEXT INST W/ 764
1775  007154                           RETH5:
1776                                    ;*****************************************************************************
1777                                    ;TEST 46 DECREMENT OF STACK POINTER ON A TRAP OPERATION
1778                                    ;*****************************************************************************
1779  007154  005237  000404           TST46:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1780  007160  022737  000046  000404           CMP     #46,@#$TESTN    ;SEQUENCE ERROR?
1781  007166  001011                   BNE     TST47-12        ;BR TO ERROR HALT ON SEQ ERROR
1782  007170  012706  000500           MOV     #BUFF,SP        ;STACK POINTER SETUP
1783  007174  012767  007204  170602   MOV     #RETJ,RTRAP5    ;RETURN POINTER
1784  007202  004000                   JSR     %0,%0           ;RESERVED INSTRUCTION
1785  007204  020627  000474           RETJ:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
1786  007210  001405                   BEQ     TST47
1787  007212  012737  000173  000402   MOV     #173,@#$FATAL   ;MOVE TO MAILBOX #  *******  173  *******
1788  007220  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1789  007222  000000                   HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
1790                                                            ; TO SCOPE REPLACE HALT W/ 240
1791                                                            ; AND REPLACE NEXT INST W/ 761
```

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1792
1793                                    ;*****************************************************************************
1794                                    ;TEST 47 THAT PROPER P.C. IS SAVED
1795                                    ;*****************************************************************************
1796  007224  005237  000404           TST47:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1797  007230  022737  000047  000404           CMP     #47,@#$TESTN    ;SEQUENCE ERROR?
1798  007236  001012                   BNE     TST50-12        ;BR TO ERROR HALT ON SEQ ERROR
1799  007240  012706  000500           MOV     #BUFF,SP        ;STACK POINTER SETUP
1800  007244  012767  007254  170532   MOV     #RETK,RTRAP5    ;RETURN FROM TRAP POINTER
1801  007252  004000                   INSTK:  JSR     %0,%0           ;TRAP ON THIS INSTRUCTION
1802  007254  022767  007254  171212   RETK:   CMP     #INSTK+2,BUFF-4 ;CHECK FOR INCREMENED P.C.
1803  007262  001405                   BEQ     TST50
1804  007264  012737  000174  000402   MOV     #174,@#$FATAL   ;MOVE TO MAILBOX #  *******  174  *******
1805  007272  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1806  007274  000000                   HALT                    ;INCORRECT P.C.,OR WRONG $TESTN
1807                                                            ; TO SCOPE REPLACE HALT W/ 240
1808                                                            ; AND REPLACE NEXT INST W/ 760
1809
1810                                    ;*****************************************************************************
1811                                    ;TEST 50 THAT 'OLD' STATUS AND PRIORITY ARE PLACED ON : ACK
1812                                    ;*****************************************************************************
1813  007276  005237  000404           TST50:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1814  007302  022737  000050  000404           CMP     #50,@#$TESTN    ;SEQUENCE ERROR?
1815  007310  001044                   BNE     TST51-12        ;BR TO ERROR HALT ON SEQ ERROR
1816  007312  012706  000500           MOV     #BUFF,SP        ;SET UP
1817  007316  012767  007340  170460   MOV     #RETL,RTRAP5    ;SET UP
1818  007324  005067  003756           CLR     STATUS          ;CLEAR STATUS AND PRIORITY
1819  007330  106467  003752           MTPS    STATUS
1820  007334  000257                   CCC
1821  007336  004000                   JSR     %0,%0           ;TRAP
1822  007340  026727  171132  000000   RETL:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
1823  007346  001405                   BEQ     1$
1824  007350  012737  000175  000402   MOV     #175,@#$FATAL   ;MOVE TO MAILBOX #  *******  175  *******
1825  007356  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1826  007360  000000                   HALT                    ;INCORRCT STATUS
1827                                                            ; TO SCOPE REPLACE HALT W/ 240
1828                                                            ; AND REPLACE NEXT INST W/ 753
1829  007362  012706  000500           1$:     MOV     #BUFF,SP        ;SET UP
1830  007366  012767  007412  170410   MOV     #RETM,RTRAP5    ;SET UP
1831  007374  012767  000357  003704   MOV     #357,STATUS             ;SET PRIORITY
1832  007402  106467  003700           MTPS    STATUS
1833  007406  000277                   SCC                     ;SET CC
1834  007410  004000                   JSR     %0,%0           ;TRAP
1835  007412  026727  171060  000357   RETM:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
1836  007420  001405                   BEQ     TST51
1837  007422  012737  000176  000402   MOV     #176,@#$FATAL   ;MOVE TO MAILBOX #  *******  176  *******
1838  007430  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1839  007432  000000                   HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
1840                                                            ; TO SCOPE REPLACE HALT W/ 240
1841                                                            ; AND REPLACE NEXT INST W/ 726
1842
1843                                    ;*****************************************************************************
1844                                    ;TEST 51 THAT 'NEW' STATUS IS CORRECT
1845                                    ;*****************************************************************************
1846  007434  005237  000404           TST51:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1847  007440  022737  000051  000404           CMP     #51,@#$TESTN    ;SEQUENCE ERROR?
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1848  007446  001122                          BNE     STP1            ;BR TO ERROR HALT ON SEQ ERROR
1849  007450  012706  000500                  MOV     #BUFF,SP
1850  007454  012767  007470  170322          MOV     #RETN,RTRAP5
1851  007462  005067  170320                  CLR     RTRAP5+2        ;CLEAR FUTURE PRIORITY AND CC
1852  007466  004000                          JSR     %0,%0
1853  007470                          RETN:                           ;TEST FOR "C" CLEARED
1854  007470  100005                          BPL     1$
1855  007472  012737  000177  000402          MOV     #177,@#$FATAL   ;MOVE TO MAILBOX #  *******  177  *******
1856  007500  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1857  007502  000000                          HALT                    ;C NOT CLEARED
1858                                                                  ; TO SCOPE REPLACE HALT W/ 240
1859                                                                  ; AND REPLACE NEXT INST W/ 761
1860  007504                          1$:
1861  007504  001005                          BNE     2$
1862  007506  012737  000200  000402          MOV     #200,@#$FATAL   ;MOVE TO MAILBOX #  *******  200  *******
1863  007514  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1864  007516  000000                          HALT                    ;Z NOT CLEARED
1865                                                                  ; TO SCOPE REPLACE HALT W/ 240
1866                                                                  ; AND REPLACE NEXT INST W/ 753
1867  007520                          2$:
1868  007520  102005                          BVC     3$
1869  007522  012737  000201  000402          MOV     #201,@#$FATAL   ;MOVE TO MAILBOX #  *******  201  *******
1870  007530  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1871  007532  000000                          HALT                    ;V NOT CLEARED
1872                                                                  ; TO SCOPE REPLACE HALT W/ 240
1873                                                                  ; AND REPLACE NEXT INST W/ 745
1874  007534                          3$:
1875  007534  103005                          BCC     4$
1876  007536  012737  000202  000402          MOV     #202,@#$FATAL   ;MOVE TO MAILBOX #  *******  202  *******
1877  007544  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1878  007546  000000                          HALT                    ;C NOT CLEARED
1879                                                                  ; TO SCOPE REPLACE HALT W/ 240
1880                                                                  ; AND REPLACE NEXT INST W/ 737
1881  007550  106767  003532          4$:     MFPS    STATUS
1882  007554  016700  003526                  MOV     STATUS,%0       ;TEMP STORAGE
1883  007560  001405                          BEQ     5$
1884  007562  012737  000203  000402          MOV     #203,@#$FATAL   ;MOVE TO MAILBOX #  *******  203  *******
1885  007570  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1886  007572  000000                          HALT                    ;PRIORITY NOT ZERO
1887                                                                  ; TO SCOPE REPLACE HALT W/ 240
1888                                                                  ; AND REPLACE NEXT INST W/ 725
1889  007574  012706  000500          5$:     MOV     #BUFF,SP
1890  007600  012767  007616  170176          MOV     #RETO,RTRAP5
1891  007606  012767  000357  170172          MOV     #357,RTRAP5+2   ;SET NEW "CC" AND PRIORITY
1892  007614  004000                          JSR     %0,%0           ;TRAP HERE
1893  007616                          RETO:
1894  007616  100405                          BMI     1$
1895  007620  012737  000204  000402          MOV     #204,@#$FATAL   ;MOVE TO MAILBOX #  *******  204  *******
1896  007626  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1897  007630  000000                          HALT                    ;N NOT SET
1898                                                                  ; TO SCOPE REPLACE HALT W/ 240
1899                                                                  ; AND REPLACE NEXT INST W/ 706
1900  007632                          1$:
1901  007632  001405                          BEQ     2$
1902  007634  012737  000205  000402          MOV     #205,@#$FATAL   ;MOVE TO MAILBOX #  *******  205  *******
1903  007642  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
```

```
1904  007644  000000                        HALT                    ;Z NOT SET
1905                                                                ; TO SCOPE REPLACE HALT W/ 240
1906                                                                ; AND REPLACE NEXT INST W/ 700
1907  007646                          2$:
1908  007646  102405                        BVS     3$
1909  007650  012737  000206  000402        MOV     #206,@#$FATAL   ;MOVE TO MAILBOX #  *******  206  *******
1910  007656  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1911  007660  000000                        HALT                    ;V NOT SET
1912                                                                ; TO SCOPE REPLACE HALT W/ 240
1913                                                                ; AND REPLACE NEXT INST W/ 672
1914  007662                          3$:
1915  007662  103405                        BCS     4$
1916  007664  012737  000207  000402        MOV     #207,@#$FATAL   ;MOVE TO MAILBOX #  *******  207  *******
1917  007672  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1918  007674  000000                        HALT                    ;C NOT SET
1919                                                                ; TO SCOPE REPLACE HALT W/ 240
1920                                                                ; AND REPLACE NEXT INST W/ 664
1921  007676  106767  003404          4$:   MFPS    STATUS
1922  007702  016700  003400              MOV     STATUS,%0
1923  007706  022700  000357              CMP     #357,%0
1924  007712  001405                        BEQ     STPBB
1925  007714                          STP1:
1926  007714  012737  000210  000402        MOV     #210,@#$FATAL   ;MOVE TO MAILBOX #  *******  210  *******
1927  007722  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1928  007724  000000                        HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
1929                                                                ; TO SCOPE REPLACE HALT W/ 240
1930                                                                ; AND REPLACE NEXT INST W/ 650
1931  007726  012767  000006  170050  STPBB: MOV     #6,4
1932  007734  005067  170046               CLR     6
```

```
1933
1934                                    ;*****************************************************************************
1935                                    ;TEST 52 THAT THE T BIT (BIT4) WILL CAUSE TRACE TRAP TO 14
1936                                    ;*****************************************************************************
1937  007740  005237  000404           TST52:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1938  007744  022737  000052  000404           CMP     #52,@#$TESTN    ;SEQUENCE ERROR?
1939  007752  001013                           BNE     TST53-12        ;BR TO ERROR HALT ON SEQ ERROR
1940  007754  012706  000500                   MOV     #BUFF,SP
1941  007760  012767  010014  170026           MOV     #RETAT,RTRAP4   ;SET UP TO TRAP TO 14
1942  007766  012746  000020                   MOV     #20,-(SP)       ;PUSH T BIT
1943  007772  012746  010000                   MOV     #.+6,-(SP)      ;PUSH PC
1944  007776  000002                           RTI                     ;SET T BIT
1945  010000  000240                           NOP                     ;TRAP HERE
1946  010002  012737  000211  000402           MOV     #211,@#$FATAL   ;MOVE TO MAILBOX #  *******  211  *******
1947  010010  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1948  010012  000000                           HALT                    ;TRACE BIT DID NOT TRAP.,OR WRONG $TESTN
1949                                                                   ; TO SCOPE REPLACE HALT W/ 240
1950                                                                   ; AND REPLACE NEXT INST W/ 757
1951  010014                           RETAT:
1952                                    ;*****************************************************************************
1953                                    ;TEST 53 STACK POINTER DECREMENTS
1954                                    ;*****************************************************************************
1955  010014  005237  000404           TST53:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1956  010020  022737  000053  000404           CMP     #53,@#$TESTN    ;SEQUENCE ERROR?
1957  010026  001023                           BNE     TST54-12        ;BR TO ERROR HALT ON SEQ ERROR
1958  010030  012706  000500                   MOV     #BUFF,SP
1959  010034  012767  010070  167752           MOV     #RETBT,RTRAP4
1960  010042  012746  000020                   MOV     #20,-(SP)       ;PUSH T BIT
1961  010046  012746  010054                   MOV     #.+6,-(SP)      ;PUSH PC
1962  010052  000002                           RTI                     ;SET T BIT
1963  010054  000240                           NOP                     ;TRAP HERE
1964  010056  012737  000212  000402           MOV     #212,@#$FATAL   ;MOVE TO MAILBOX #  *******  212  *******
1965  010064  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1966  010066  000000                           HALT                    ;TRACE BIT DID NOT TRAP!
1967                                                                   ; TO SCOPE REPLACE HALT W/ 240
1968                                                                   ; AND REPLACE NEXT INST W/ 757
1969  010070  020627  000474           RETBT:  CMP     SP,#BUFF-4
1970  010074  001405                           BEQ     TST54
1971  010076  012737  000213  000402           MOV     #213,@#$FATAL   ;MOVE TO MAILBOX #  *******  213  *******
1972  010104  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1973  010106  000000                           HALT                    ;STACK POINTER WAS NOT PUSHED BY TRAP,OR WRONG $TESTN
1974                                                                   ; TO SCOPE REPLACE HALT W/ 240
1975                                                                   ; AND REPLACE NEXT INST W/ 747
```

```
                                        ;*****************************************************************************
                                        ;TEST 54 FOR PROPER PC ON STACK
                                        ;*****************************************************************************
010110  005237  000404          TST54:  INC     @#$TESTN        ;UPDATE TEST NUMBER
010114  022737  000054  000404          CMP     #54,@#$TESTN    ;SEQUENCE ERROR?
010122  001016                        BNE     TST55-12        ;BR TO ERROR HALT ON SEQ ERROR
010124  012706  000500                MOV     #BUFF,SP
010130  012767  010150  167656        MOV     #RETCT,RTRAP4
010136  012746  000020                MOV     #20,-(SP)       ;PUSH T BIT
010142  012746  010150                MOV     #.+6,-(SP)      ;PUSH PC
010146  000002                        RTI                     ;SET T BIT
                                                                ;TRAP HERE
010150  022767  010150  170316  RETCT: CMP     #.,BUFF-4
010156  001405                        BEQ     TST55
010160  012737  000214  000402        MOV     #214,@#$FATAL   ;MOVE TO MAILBOX #  *******  214  *******
010166  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
010170  000000                        HALT                    ;CORRECT PC WAS NOT SAVED ON STACK,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 754


                                        ;*****************************************************************************
                                        ;TEST 55 THAT RTT POPS T- BIT
                                        ;*****************************************************************************
010172  005237  000404          TST55:  INC     @#$TESTN        ;UPDATE TEST NUMBER
010176  022737  000055  000404          CMP     #55,@#$TESTN    ;SEQUENCE ERROR?
010204  001015                        BNE     TST56-12        ;BR TO ERROR HALT ON SEQ ERROR

010206  012706  000500                MOV     #BUFF,SP
010212  005001                        CLR     R1              ;CLEAR R1
010214  012746  000020                MOV     #20,-(SP)
010220  012746  010234                MOV     #RTT1,-(SP)
010224  012767  010252  167562        MOV     #RTT2,14
010232  000006                        RTT
010234  000240                RTT1:   NOP
010236  001405                        BEQ     TST56
010240  012737  000215  000402        MOV     #215,@#$FATAL   ;MOVE TO MAILBOX #  *******  215  *******
010246  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
010250  000000                        HALT                    ;T-BIT DID NOT TRAP,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 755

010252                          RTT2:
```

```
2020
2021                                    ;*****************************************************************************
2022                                    ;TEST 56 THAT RTT ALLOWS ONE INST. BEFORE TRAP
2023                                    ;*****************************************************************************
2024  010252  005237  000404           TST56:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2025  010256  022737  000056  000404           CMP     #56,@#$TESTN    ;SEQUENCE ERROR?
2026  010264  001031                         BNE     TST57-12        ;BR TO ERROR HALT ON SEQ ERROR
2027  010266  012705  17777?                 MOV     #177777,%5
2028  010272  012706  000500           RTT5:   MOV     #BUFF,SP
2029  010276  012746  000020                 MOV     #20,-(SP)
2030  010302  012746  010320                 MOV     #RTT3,-(SP)
2031  010306  012767  010340  167500         MOV     #RTT4,14
2032  010314  005001                         CLR     R1              ;CLEAR R0
2033  010316  000006                         RTT                     ;SET T-BIT
2034  010320  005201                 RTT3:   INC     R1
2035  010322  00520?                         INC     %5
2036  010324  001762                         BEQ     RTT5            ;DO THIS TEST NO MORE THAN 2 TIMES
2037  010326  012737  000216  000402         MOV     #216,@#$FATAL   ;MOVE TO MAILBOX #  *******  216  *******
2038  010334  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2039  010336  000000                         HALT                    ;DID NOT TRAP
2040                                                                  ; TO SCOPE REPLACE HALT W/ 240
2041                                                                  ; AND REPLACE NEXT INST W/ 752
2042  010340  005301                 RTT4:   DEC     R1              ;SEE IF RTT ALLOWS 1 INST.
2043  010342  001407                         BEQ     RTT6
2044  010344  005205                         INC     %5              ;DO THIS TEST NO MORE THAN TWO TIMES
2045  010346  001751                         BEQ     RTT5
2046  010350  012737  000217  000402         MOV     #217,@#$FATAL   ;MOVE TO MAILBOX #  *******  217  *******
2047  010356  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2048  010360  000000                         HALT                    ;RTT DID NOT ALLOW 1 INST.,OR WRONG $TESTN
2049                                                                  ; TO SCOPE REPLACE HALT W/ 240
2050                                                                  ; AND REPLACE NEXT INST W/ 741
2051  010362                           RTT6:
```

```
2052
2053                                    ;*****************************************************************************
2054                                    ;TEST 57 THAT RTI DOES NOT ALLOW 1 INST.
2055                                    ;*****************************************************************************
2056  010362  005237  000404           TST57:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2057  010366  022737  000057  000404           CMP     #57,@#$TESTN    ;SEQUENCE ERROR?
2058  010374  001023                           BNE     TST60-12        ;BR TO ERROR HALT ON SEQ ERROR
2059  010376  012706  000500                   MOV     #BUFF,SP
2060  010402  012746  000020                   MOV     #20,-(SP)
2061  010406  012746  010424                   MOV     #RTI1,-(SP)
2062  010412  012767  010440  167374           MOV     #RTI2,14
2063  010420  005001                           CLR     R1
2064  010422  000002                           RTI                     ;SET T-BIT
2065  010424  005201                   RTI1:   INC     R1              ;RTI SHOULD NOT ALLOW THIS
2066  010426  012737  000220  000402           MOV     #220,@#$FATAL   ;MOVE TO MAILBOX #  *******  220  *******
2067  010434  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2068  010436  000000                           HALT                    ;T- BIT DID NOT CAUSE TRAP
2069                                                                   ; TO SCOPE REPLACE HALT W/ 240
2070                                                                   ; AND REPLACE NEXT INST W/ 756
2071  010440  005701                   RTI2:   TST     R1
2072                                                                   ;RTI SHOULD NOT ALLOW 1 INST. BEFORE TRAP
2073  010442  001405                           BEQ     TST60
2074  010444  012737  000221  000402           MOV     #221,@#$FATAL   ;MOVE TO MAILBOX #  *******  221  *******
2075  010452  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2076  010454  000000                           HALT                    ;RTI DID ALLOW 1 INST. BEFORE TRAP,OR WRONG $TESTN
2077                                                                   ; TO SCOPE REPLACE HALT W/ 240
2078                                                                   ; AND REPLACE NEXT INST W/ 747
```

```
 2079
 2080                                   ;*****************************************************************************
 2081                                   ;TEST 60 TRAP ON TRAP
 2082                                   ;*****************************************************************************
 2083  010456  005237  000404           TST60:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 2084  010462  022737  000060  000404           CMP     #60,@#$TESTN    ;SEQUENCE ERROR?
 2085  010470  001033                           BNE     TRACE           ;BR TO ERROR HALT ON SEQ ERROR
 2086                                   ;TEST THAT TRACE BIT TRAPS ARE INHIBITED ON TRAP INST
 2087
 2088  010472  012705  177777                   MOV     #177777,%5
 2089  010476  012706  000500           TRPTRP: MOV     #BUFF,%6
 2090  010502  012767  010554  167304           MOV     #TRACE1,14      ;TRACE TRAP
 2091  010510  005027  000016                   CLR     #16             ;
 2092  010514  005027  000022                   CLR     #22
 2093  010520  012767  010572  167272           MOV     #TONT1,20       ;IOT TRAP
 2094  010526  012746  000020                   MOV     #20,-(SP)       ;PUSH T BIT
 2095  010532  012746  010540                   MOV     #.+6,-(SP)      ;PUSH PC
 2096  010536  000006                           RTT                     ;SET T BIT
 2097  010540  000004                           IOT                     ;TRAP, NEW STATUS HAVE TRACE RESET
 2098  010542  012737  000222  000402           MOV     #222,@#$FATAL   ;MOVE TO MAILBOX #  *******  222  *******
 2099  010550  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 2100  010552  000000                           HALT                    ;NO TRAP OCCURRED
 2101                                                                   ; TO SCOPE REPLACE HALT W/ 240
 2102                                                                   ; AND REPLACE NEXT INST W/ 746
 2103  010554  005205                   TRACE1: INC     %5      ;IF FAILED TRY THIS TEST TWICE BUT NO MORE
 2104  010556  001747                           BEQ     TRPTRP
 2105  010560                           TRACE:
 2106  010560  012737  000223  000402           MOV     #223,@#$FATAL   ;MOVE TO MAILBOX #  *******  223  *******
 2107  010566  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 2108  010570  000000                           HALT                    ;IOT SHOULD HAVE CLEARED THE T BIT,OR WRONG $TESTN
 2109                                                                   ; TO SCOPE REPLACE HALT W/ 240
 2110                                                                   ; AND REPLACE NEXT INST W/ 737
 2111  010572  012767  000016  167214   TONT1:  MOV     #16,14
 2112  010600  012767  000022  167212           MOV     #22,20
```

```
2113
2114                                    ;*****************************************************************************
2115                                    ;TEST 61 THAT THE TRACE BIT WILL CAUSE A TRAP
2116                                    ;*****************************************************************************
2117  010606  005237  000404           TST61:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2118  010612  022737  000061  000404          CMP     #61,@#$TESTN    ;SEQUENCE ERROR?
2119  010620  001026                          BNE     TST62-12        ;BR TO ERROR HALT ON SEQ ERROR
2120  010622  012706  000500                  MOV     #BUFF,%6        ;SET UP STACK POINTER
2121  010626  012767  010666  167160          MOV     #TRC1,14        ;TRACE TRAP RETURN
2122  010634  005067  167156                  CLR     16
2123  010640  012746  000020                  MOV     #20,-(SP)       ;PUSH T BIT
2124  010644  012746  010652                  MOV     #.+6,-(SP)      ;PUSH PC
2125  010650  000002                          RTI                     ;SET T BIT
2126  010652  000240                          NOP
2127  010654  012737  000224  000402          MOV     #224,@#$FATAL   ;MOVE TO MAILBOX #  *******  224  *******
2128  010662  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2129  010664  000000                          HALT                    ;DO NOT TRAP
2130                                                                  ; TO SCOPE REPLACE HALT W/ 240
2131                                                                  ; AND REPLACE NEXT INST W/ 755
2132  010666  036727  167604  000020  TRC1:   BIT     BUFF-2,#20      ;CHECK FOR T BIT ON STACK
2133  010674  001005                          BNE     TST62
2134  010676  012737  000225  000402          MOV     #225,@#$FATAL   ;MOVE TO MAILBOX #  *******  225  *******
2135  010704  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2136  010706  000000                          HALT                    ;T BIT NOT SAVED ON STACKED,OR WRONG $TESTN
2137                                                                  ; TO SCOPE REPLACE HALT W/ 240
2138                                                                  ; AND REPLACE NEXT INST W/ 744
2139                                    ;** *************************************************************************
2140                                    ;TEST 62 THAT AN RTI POPS THE T BIT
2141                                    ;*****************************************************************************
2142  010710  005237  000404           TST62:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2143  010714  022737  000062  000404          CMP     #62,@#$TESTN    ;SEQUENCE ERROR?
2144  010722  001020                          BNE     TST63-12        ;BR TO ERROR HALT ON SEQ ERROR
2145  010724  012706  000500                  MOV     #BUFF,%6        ;SET UP THE STACK
2146  010730  012746  000020                  MOV     #20,-(6)        ;FUTURE T BIT ON STACK
2147  010734  012746  010 50                  MOV     #TRC2,-(6)      ;RTI RETURN
2148  010740  012767  010764  167046          MOV     #TRC3,14        ;TRACE TRAP INTERRUPT POINTER
2149  010746  000002                          RTI
2150
2151  010750  000240                  TRC2:   NOP                     ;TRACE IS SET SHOULD TRAP TO 14
2152  010752  012737  000226  000402          MOV     #226,@#$FATAL   ;MOVE TO MAILBOX #  *******  226  *******
2153  010760  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2154  010762  000000                          HALT                    ;DID NOT TRACE TRAP,OR WRONG $TESTN
2155                                                                  ; TO SCOPE REPLACE HALT W/ 240
2156                                                                  ; AND REPLACE NEXT INST W/ 757
2157
2158  010764  012767  000016  167022  TRC3:   MOV     #16,14
2159  010772  005067  167020                  CLR     16
```

```
2160
2161                                    ;*****************************************************************************
2162                                    ;TEST 63 THAT A PENDING INTERRUPT OCCURS BEFORE TRAP
2163                                    ;*****************************************************************************
2164  010776  005237  000404           TST63:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2165  011002  022737  000063  000404           CMP     #63,@#$TESTN    ;SEQUENCE ERROR?
2166  011010  001055                          BNE     TR1             ;BR TO ERROR HALT ON SEQ ERROR
2167  011012  032767  000001  167400          BIT     #1,$ENV         ; CHECK IF ON APT
2168  011020  001403                          BEQ     NOAPT           ; IF NOT ON APT
2169  011022  005767  167360                  TST     $PASS           ; CHECK IF ON FIRST PASS
2170  011026  001055                          BNE     TST64           ; IF NOT FIRST PASS
2171  011030                          NOAPT:
2172  011030  105737  177564                  TSTB    @#TPS
2173  011034  100375                          BPL     .-4
2174  011036  012706  000500                  MOV     #BUFF,%6
2175  011042  012767  000340  002236          MOV     #340,STATUS     ;HIGHEST PRIORITY LEVEL
2176  011050  106467  002232                  MTPS    STATUS
2177  011054  012767  011132  167002          MOV     #TR0,64
2178  011062  012767  000100  166474          MOV     #100,TTCSR      ;INTERRUPT FOR TTY PUNCH/PRINTER
2179  011070  012704  000120                  MOV     #120,R4         ;SET UP DELAY IN CASE ON PDT-11 (IT TAKES LONG
2180  011074  077401                          SOB     R4,.            ;TIME FOR INTERRUPT REQUEST TO BE SEEN BY CPU)
2181  011076  012767  011144  166730          MOV     #TR1,34         ;TRAP VECTOR
2182  011104  012767  011156  166752          MOV     #TR2,64         ;TTY VECTOR
2183  011112  012767  000340  166716          MOV     #340,36         ;IF TRAP TRAPS, MOVE 340 TO PRIORITY
2184  011120  005067  002162                  CLR     STATUS          ;SHOULD TRAP AT END OF CLR INST
2185  011124  106467  002156                  MTPS    STATUS
2186  011130  104400                          TRAP                    ;TTY INTERRUPT SHOULD OVERRIDE TRAP
2187  011132                          TR0:
2188  011132  012737  000227  000402          MOV     #227,@#$FATAL   ;MOVE TO MAILBOX #  *******  227  *******
2189  011140  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2190  011142  000000                          HALT                    ;TTY SHOULDN'T HAVE INTERRUPTED
2191                                                                  ; TO SCOPE REPLACE HALT W/ 240
2192                                                                  ; AND REPLACE NEXT INST W/ 722
2193  011144                          TR1:
2194  011144  012737  000230  000402          MOV     #230,@#$FATAL   ;MOVE TO MAILBOX #  *******  230  *******
2195  011152  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2196  011154  000000                          HALT                    ;INTERRUPT DID NOT OCCUR FIRST,OR WRONG $TESTN
2197                                                                  ; TO SCOPE REPLACE HALT W/ 240
2198                                                                  ; AND REPLACE NEXT INST W/ 715
2199  011156  005067  166654          TR2:    CLR     36
```

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2200
2201                                    ;*****************************************************************************
2202                                    ;TEST 64 THAT PENDING INTERRUPT OCCURS BETWEEN TRAPS
2203                                    ;*****************************************************************************
2204  011162  005237  000404           TST64:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2205  011166  022737  000064  000404           CMP     #64,@#$TESTN    ;SEQUENCE ERROR?
2206  011174  001045                   BNE     TR5             ;BR TO ERROR HALT ON SEQ ERROR
2207  011176  032767  000001  167214   BIT     #1,$ENV         ;CHECK IF ON APT
2208  011204  001403                   BEQ     NOAPT1          ; IF NOT
2209  011206  005767  167174           TST     $PASS           ; CHECK IF ON FIRST PASS
2210  011212  001060                   BNE     TST65           ; IF NOT
2211  011214                           NOAPT1:
2212  011214  042767  000100  166342   BIC     #100,TTCSR
2213  011222  012706  000500           MOV     #BUFF,%6
2214  011226  012767  000340  002052   MOV     #340,STATUS
2215  011234  106467  002046           MTPS    STATUS
2216  011240  012767  000100  166316   MOV     #100,TTCSR
2217  011246  012767  011306  166560   MOV     #TR3,34         ;TRAP
2218  011254  012767  011322  166602   MOV     #TR4,64         ;TTY OUTPUT
2219  011262  012767  011310  166530   MOV     #TR5,20         ;IOT
2220  011270  012767  000340  166524   MOV     #340,22         ;IOT PRIORITY
2221  011276  012704  000120           MOV     #120,R4         ;SET UP DELAY IN CASE ON PDT-11 (IT TAKES LONG
2222  011302  077401                   SOB     R4,.            ;TIME FOR INTERRUPT REQUEST TO BE SEEN BY CPU)
2223  011304  104400                   TRAP                    ;THE ACT OF TRAPPING LOWER PRIORITY
2224  011306  000004           TR3:    IOT                     ;INTERRUPT SHOULD OCCUR IN PLACE OF IOT TRAP
2225  011310                   TR5:
2226  011310  012737  000231  000402   MOV     #231,@#$FATAL   ;MOVE TO MAILBOX #  *******  231  *******
2227  011316  005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2228  011320  000000                   HALT                    ;NO INTERRUPT BETWEEN TRAPS,OR WRONG $TESTN
2229                                                            ; TO SCOPE REPLACE HALT W/ 240
2230                                                            ; AND REPLACE NEXT INST W/ 725
2231  011322  005067  166474   TR4:    CLR     22              ;CLR IOT PRIORITY
2232  011326  005067  166534           CLR     66
2233  011332  012767  000066  166524   MOV     #66,64
2234  011340  012767  000036  166466   MOV     #36,34
2235  011346  012767  000022  166444   MOV     #22,20
2236
```

```
2237
2238                                    ;*****************************************************************************
2239                                    ;TEST 65 THAT 'RESET' GOES TO OUTSIDE WORLD
2240                                    ;*****************************************************************************
2241  011354  005237  000404           TST65:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2242  011360  022737  000065  000404           CMP     #65,@#$TESTN    ;SEQUENCE ERROR?
2243  011366  001031                         BNE     TST66-12        ;BR TO ERROR HALT ON SEQ ERROR
2244  011370  106427  000340                 MTPS    #340
2245  011374  012767  000100  166162         MOV     #100,TTCSR      ;SET INTERRUPT ENABLE
2246  011402  012767  000100  166150         MOV     #100,TRCSR      ;SET INTERRUPT ENABLE
2247  011410  000005                         RESET                   ;SHOULD CLEAR INTERRUPT ENABLE
2248  011412  012704  000014                 MOV     #14,R4          ;DELAY AFTER THE RESET IN CASE ON PDT-11 TO
2249  011416  077401                         SOB     R4,.            ;ALLOW 8085 TO BE READY FOR I/O PAGE REFERENCE
2250  011420  032767  000100  166136         BIT     #100,TTCSR      ;TEST FOR CLEAR
2251  011426  001405                         BEQ     1$
2252  011430  012737  000232  000402         MOV     #232,@#$FATAL   ;MOVE TO MAILBOX #  *******  232  *******
2253  011436  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2254  011440  000000                         HALT                    ;RESET FAILED TO CLEAR TTCSR
2255                                                                  ; TO SCOPE REPLACE HALT W/ 240
2256                                                                  ; AND REPLACE NEXT INST W/ 752
2257  011442  032767  000100  166110  1$:    BIT     #100,TRCSR      ;TEST FOR CLEAR
2258  011450  001405                         BEQ     TST66
2259  011452  012737  000233  000402         MOV     #233,@#$FATAL   ;MOVE TO MAILBOX #  *******  233  *******
2260  011460  005212                         INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2261  011462  000000                         HALT                    ;RESET FAILED TO CLEAR TRCSR,OR WRONG $TESTN
2262                                                                  ; TO SCOPE REPLACE HALT W/ 240
2263                                                                  ; AND REPLACE NEXT INST W/ 741
```

```
2264
2265                                    ;*****************************************************************************
2266                                    ;TEST 66 THAT RESET HAS NO EFFECT ON THE TRACE TRAP
2267                                    ;*****************************************************************************
2268  011464  005237  000404           TST66:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2269  011470  022737  000066  000404          CMP     #66,@#$TESTN    ;SEQUENCE ERROR?
2270  011476  001014                          BNE     RSTP3           ;BR TO ERROR HALT ON SEQ ERROR
2271  011500  012706  000500                  MOV     #BUFF,%6        ;SET STACK
2272  011504  012767  011542  166302          MOV     #RESET2,14      ;SET UP TRACE VECTOR
2273  011512  012746  000020                  MOV     #20,-(SP)       ;PUSH T BIT
2274  011516  012746  011524                  MOV     #.+6,-(SP)      ;PUSH PC
2275  011522  000006                          RTT                     ;SET T BIT
2276  011524  000005                          RESET                   ;SHOULD HAVE NO EFFECT
2277  011526  000005                          RESET                   ;NO EFFECT
2278  011530                          RSTP3:
2279  011530  012737  000234  000402          MOV     #234,@#$FATAL   ;MOVE TO MAILBOX #  *******  234  *******
2280  011536  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2281  011540  000000                          HALT                    ;TRACE TRAP FAILED,OR WRONG $TESTN
2282                                                                  ; TO SCOPE REPLACE HALT W/ 240
2283                                                                  ; AND REPLACE NEXT INST W/ 756
2284  011542  005067  001540          RESET2: CLR     STATUS          ;CLEAR TRACK
2285  011546  106467  001534                  MTPS    STATUS
2286  011552  012767  000016  166234          MOV     #16,14
2287  011560  005067  166232                  CLR     16              ;TRACE STATUS
```

```
2288
2289                                    ;*****************************************************************************
2290                                    ;TEST 67 THAT WHEN TTY INTERRUPTS IT POPS NEW STATUS
2291                                    ;*****************************************************************************
2292  011564  005237  000404           TST67:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2293  011570  022737  000067  000404          CMP     #67,@#$TESTN    ;SEQUENCE ERROR?
2294  011576  001103                          BNE     RSTP4           ;BR TO ERROR HALT ON SEQ ERROR
2295  011600  032767  000001  166612          BIT     #1,$ENV         ; CHECK IF ON APT
2296  011606  001403                          BEQ     NOAPT2          ; IF NOT ON APT
2297  011610  005767  166572                  TST     $PASS           ;CHECK IF FIRST PASS
2298  011614  001106                          BNE     TST70           ; IF NOT
2299  011616                           NOAPT2:
2300  011616  000005                          RESET
2301  011620  012704  000012                  MOV     #12,R4          ;DELAY AFTER THE RESET IN CASE ON PDT-11 TO
2302  011624  077401                          SOB     R4,.            ;ALLOW 8085 TO BE READY FOR I/O PAGE REFERENCE
2303  011626  012706  000500                  MOV     #BUFF,%6        ;SET UP STACK
2304  011632  012767  011700  166224          MOV     #TTY3,64        ;INTERRUPT VECTOR
2305  011640  106427  000000                  MTPS    #0
2306  011644  012767  000357  166214          MOV     #357,66         ;HIGH PRIORITY ON INTERRUPT
2307  011652  052767  000100  165704          BIS     #100,TTCSR      ;SHOULD SET INTERRUPT ENABLE & INTERRUPT
2308  011660  012704  000120                  MOV     #120,R4         ;SET UP DELAY IN CASE ON PDT-11 (IT TAKES LONG
2309  011664  077401                          SOB     R4,.            ;TIME FOR INTERRUPT REQUEST TO BE SEEN BY CPU)
2310  011666  012737  000235  000402          MOV     #235,@#$FATAL   ;MOVE TO MAILBOX #  *******  235  *******
2311  011674  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2312  011676  000000                          HALT                    ;NO INTERRUPT
2313                                                                  ; TO SCOPE REPLACE HALT W/ 240
2314                                                                  ; AND REPLACE NEXT INST W/ 737
2315  011700  106767  001402           TTY3:   MFPS    STATUS
2316  011704  022767  000357  001374          CMP     #357,STATUS
2317  011712  001405                          BEQ     1$
2318  011714  012737  000236  000402          MOV     #236,@#$FATAL   ;MOVE TO MAILBOX #  *******  236  *******
2319  011722  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2320  011724  000000                          HALT                    ;INTERRUPT DID NOT POP CORRECT STATUS
2321                                                                  ; TO SCOPE REPLACE HALT W/ 240
2322                                                                  ; AND REPLACE NEXT INST W/ 724
2323  011726  000005                   1$:     RESET                   ;CLR NTERRUPT ENABLE
2324  011730  012704  000012                  MOV     #12,R4          ;DELAY AFTER THE RESET IN CASE ON PDT-11 TO
2325  011734  077401                          SOB     R4,.            ;ALLOW 8085 TO BE READY FOR I/O PAGE REFERENCE
2326  011736  012706  000500                  MOV     #BUFF,%6        ;STACK SET UP
2327  011742  012767  011774  166114          MOV     #TTY4,64        ;INTERRUPT VECTOR
2328  011750  005067  166112                  CLR     66              ;CLR NEW STATUS
2329  011754  106427  000017                  MTPS    #17
2330  011760  052767  000100  165576          BIS     #100,TTCSR      ;SET INTERRUPT ENABLE
2331  011766  012704  000120                  MOV     #120,R4         ;SET UP DELAY IN CASE ON PDT-11
2332  011772  077401                          SOB     R4,.            ;WAIT FOR TTY INTERRUPT REQUEST TO GET THRU TO CPU (ON T
2333  011774  106767  001306           TTY4:   MFPS    STATUS
2334  012000  005767  001302                  TST     STATUS
2335  012004  001405                          BEQ     RST4
2336  012006                           RSTP4:
2337  012006  012737  000237  000402          MOV     #237,@#$FATAL   ;MOVE TO MAILBOX #  *******  237  *******
2338  012014  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2339  012016  000000                          HALT                    ;INTERRUPT DID NOT POP CORRECT STATUS,OR WRONG $TESTN
2340                                                                  ; TO SCOPE REPLACE HALT W/ 240
2341                                                                  ; AND REPLACE NEXT INST W/ 667
2342  012020  005067  165540           RST4:   CLR     TTCSR
2343  012024  012767  000066  166032          MOV     #66,64
```

```
2344
2345                                    ;THIS ROUTINE TESTS THAT NO LEGAL ADDRESS TRAPS AND THAT AN ILLEGAL
2346                                    ;ADDRESS TRAPS TO LOCATION 4.  THIS WILL RUN ON 30K SYSTEMS.  IF SWITCH
2347                                    ;REGISTER BIT 1 = 0, THEN THE MEMORY FROM 28K-30K IS NOT LOOKED
2348                                    ;AT, SINCE IT MAY HAVE I/O DEVICES.  IF SWR BIT 1 = 1, THEN THAT
2349                                    ;AREA IS CHECKED. (IT SHOULD EITHER ALL TRAP OR ALL NOT TRAP).  LOC 160000
2350                                    ;IS NO LONGER GUARANTEED TO TRAP, SINCE IT MAY CONTAIN MEMORY.  LOCATION
2351                                    ;177700 (THE UNIBUS ADDRESS FOR R0 ON OLDER SYSTEMS) IS USED FOR FORCING
2352                                    ;A TIMEOUT IN THE EVENT THAT THERE WAS NONE FROM 0K-28K(30K).
2353                                    ;THIS ROUTINE WILL ALSO WORK IF THERE IS A ROM ABOVE THE HIGHEST
2354                                    ;MEMORY LOCATION (WHETHER CONTIGUOUS WITH R/W MEMORY OR NOT).
2355                                    ;*****************************************************************************
2356                                    ;TEST 70 NON-EXISTENT ADDRESS TRAPS
2357                                    ;*****************************************************************************
2358  012032  005237  000404           TST70:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2359  012036  022737  000070  000404           CMP     #70,@#$TESTN    ;SEQUENCE ERROR?
2360  012044  001141                          BNE     AUTO1           ;BR TO ERROR HALT ON SEQ ERROR
2361
2362                                    ;THIS ROUTINE TESTS MEMORY UNTIL IT DOES A NXM STOP
2363  012046  042737  010000  012116           BIC     #10000,@#HICORE ;SET HIGH CORE LIMIT TO 160000
2364  012054  032737  000002  000422           BIT     #2,@#$SWREG     ;CHECK IF BIT 1 IS SET
2365  012062  001403                          BEQ     1$              ;BRANCH IF IT IS, LEAVE LIMIT 160000
2366  012064  052737  010000  012116           BIS     #10000,@#HICORE ;SET UPPER CORE LIMIT TO 30K (170000)
2367  012072  005000                  1$:     CLR     R0
2368  012074  005067  165706                   CLR     6
2369  012100  012767  012222  165676           MOV     #ATRAP,4        ;SET UP ADDRESS TRAP ENTRANCE
2370  012106  012706  000500                   MOV     #BUFF,SP
2371  012112  105720                  NOR:    TSTB    (0)+            ;IF OUTSIDE OF CORE, TRAP TO 4
2372  012114  020027                          CMP     R0,(PC)+        ;IS POINTER INSIDE 28K (30K) CORE
2373  012116  160000                  HICORE: .WORD   160000          ;MAY BE CHANGED TO 170000 IF 30K
2374  012120  103774                          BLO     NOR             ;TEST THE REST OF CORE
2375  012122  013737  012116  012266           MOV     @#HICORE,@#CORH ;FOR USE BY END OF PASS CHECKER IF ON TIM
2376  012130  012737  012154  000004           MOV     #ROTRAP,@#4     ;SET UP NEW VECTOR POINTER
2377  012136  105737  177700                   TSTB    @#177700        ;CHECK R0 UNIBUS ADDRESS--SHOULD TRAP ON LSI
2378  012142                          TRPADR:
2379  012142  012737  000240  000402           MOV     #240,@#$FATAL   ;MOVE TO MAILBOX #  *******  240  *******
2380  012150  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2381  012152  000000                          HALT                    ;SHOULD HAVE TRAPED
2382                                                                  ; TO SCOPE REPLACE HALT W/ 240
2383                                                                  ; AND REPLACE NEXT INST W/ 734
2384
2385                                    ;TRAP TO HERE IF FORCING TRAP BY TESTING 177700
2386  012154  106767  001126          ROTRAP: MFPS    STATUS
2387  012160  005767  001122                  TST     STATUS
2388  012164  001405                          BEQ     1$
2389  012166  012737  000241  000402           MOV     #241,@#$FATAL   ;MOVE TO MAILBOX #  *******  241  *******
2390  012174  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2391  012176  000000                          HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
2392                                                                  ; TO SCOPE REPLACE HALT W/ 240
2393                                                                  ; AND REPLACE NEXT INST W/ 722
2394  012200  026727  166270  012142  1$:     CMP     BUFF-4,#TRPADR
2395  012206  001465                          BEQ     TRAPB
2396  012210  012737  000242  000402           MOV     #242,@#$FATAL   ;MOVE TO MAILBOX #  *******  242  *******
2397  012216  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2398  012220  000000                          HALT                    ;OLD PC WAS NOT SAVED
2399                                                                  ; TO SCOPE REPLACE HALT W/ 240
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2400                                                    ; AND REPLACE NEXT INST W/ 711
2401                                    ;RETURN HERE ON AN ADDRESS TRAP FROM MEMORY BELOW 28K (OR 30K)
2402  012222  005300                    ATRAP:  DEC     R0
2403  012224  010067  000036                    MOV     R0,CORH         ;MOVE THE FIRST NXM LOCATION IN CORH
2404                                    ;THIS ROUTINE DOES NXM TRAPS UNTIL IT FINDS AN EXISTANT MEMORY LOCATION
2405  012230  013700  012116                    MOV     @#HICORE,R0     ;SET UP THE HIGHEST MEM LOCATION
2406  012234  005300                            DEC     R0              ;MAKE 1 LESS THAN THE HIGHEST CORE BOUNDARY
2407  012236  000402                            BR      NOSUB           ;DON'T SUBTRACT 1K FIRST TIME
2408  012240  162700  001000          CTRAP:  SUB     #1000,R0        ;SUBTRACT 1K OCTAL BYTE FROM ADDRESS BECAUSE
2409                                                                    ;IT TAKES FOREVER TO GET TIMEOUT ON TIM
2410  012244  012767  012304  165532 NOSUB:  MOV     #BTRAP,4        ;SET UP THE VECTOR
2411  012252  012706  000500                    MOV     #BUFF,SP
2412  012256  011005                            MOV     (R0),R5         ;SAVE THE WORD IF IT IS THERE--TRAP IF NOT
2413  012260  005010                    DTRAP1: CLR     (R0)            ;IT WAS THERE--TRAP IF IT IS ROM
2414  012262  010510                    DTRAP2: MOV     R5,(R0)         ;NOT ROM--RESTORE WORD
2415  012264  020027                            CMP     R0,(PC)+        ;DO LOCATIONS MATCH?
2416  012266  000000                    CORH:   .WORD   0
2417  012270  101434                            BLOS    TRAPB
2418  012272  012737  000243  000402            MOV     #243,@#$FATAL   ;MOVE TO MAILBOX #  *******  243  *******
2419  012300  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2420  012302  000000                            HALT                    ;CONTENTS OF R0 SHOULD HAVE BEEN LESS THAN OR EQUAL TO (
2421                                                                    ; TO SCOPE REPLACE HALT W/ 240
2422                                                                    ; AND REPLACE NEXT INST W/ 660
2423                                                                    ;IF THIS COMPARISON FAILS IT MEANS
2424                                                                    ;THAT SOME LEGAL ADDRESS TRAPPED OR
2425                                                                    ;THAT AN ILLEGAL ADDRESS DID NOT TRAP
2426  012304  106767  000776          BTRAP:  MFPS    STATUS
2427  012310  005767  000772                  TST     STATUS
2428  012314  001405                          BEQ     1$
2429  012316  012737  000244  000402          MOV     #244,@#$FATAL   ;MOVE TO MAILBOX #  *******  244  *******
2430  012324  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2431  012326  000000                          HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
2432                                                                  ; TO SCOPE REPLACE HALT W/ 240
2433                                                                  ; AND REPLACE NEXT INST W/ 646
2434  012330  026727  166140  012260 1$:     CMP     BUFF-4,#DTRAP1
2435  012336  001740                        BEQ     CTRAP           ;BRANCH IF TRAP PC IS OK
2436  012340  026727  166130  012262        CMP     BUFF-4,#DTRAP2  ;CHECK IF IT TRAPPED ON THE CLR INSTR
2437  012346  001734                        BEQ     CTRAP
2438  012350                          AUTO1:
2439  012350  012737  000245  000402        MOV     #245,@#$FATAL   ;MOVE TO MAILBOX #  *******  245  *******
2440  012356  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2441  012360  000000                        HALT                    ;OLD PC WAS NOT SAVED OR WRONG $TESTN
2442                                                                ; TO SCOPE REPLACE HALT W/ 240
2443                                                                ; AND REPLACE NEXT INST W/ 631
2444  012362  012767  000006  165414 TRAPB:  MOV     #6,4
2445  012370  005067  165412                 CLR     6
```

```
2446
2447                                    ;*****************************************************************************
2448                                    ;TEST 71 THE 'WAIT' INSTRUCTION
2449                                    ;*****************************************************************************
2450  012374  005237  000404           TST71:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2451  012400  022737  000071  000404           CMP     #71,@#$TESTN    ;SEQUENCE ERROR?
2452  012406  001070                           BNE     REES1           ;BR TO ERROR HALT ON SEQ ERROR
2453  012410  032767  000001  166002           BIT     #1,$ENV ;CHECK IF ON APT
2454  012416  001403                           BEQ     NOAPT3          ;BR, IF NOT ON APT
2455  012420  005767  165762                   TST     $PASS           ;CHECK IF FIRST PASS
2456  012424  001066                           BNE     REES            ;BR, IF NOT
2457  012426  042767  000100  165130  NOAPT3: BIC     #100,TPS        ;CLEAR INTERRUPT ENABLE
2458  012434  012706  000500                   MOV     #BUFF,SP        ;SET UP THE STACK
2459  012440  012767  012534  165416           MOV     #WATE,64        ;SET UP THE INTERRUPT VECTOR
2460  012446  005067  165414                   CLR     66
2461  012452  105767  165106           WATE1:  TSTB    TPS             ;WAIT FOR READY
2462  012456  100375                           BPL     WATE1           ;TO BE UP
2463  012460  012767  000015  165100           MOV     #15,TPB         ;DO A CARRIAGE RETURN
2464  012466  105767  165072           WATE2:  TSTB    TPS             ;WAIT FOR READY TO COME UP
2465  012472  100375                           BPL     WATE2
2466  012474  012767  000015  165064           MOV     #15,TPB         ;DO ANOTHER CARRIAGE RETURN
2467  012502  052767  000100  165054           BIS     #100,TPS        ;SET THE INTERRUPT ENABLE
2468  012510  005067  000572                   CLR     STATUS          ;CLEAR THE PSW
2469  012514  106467  000566                   MTPS    STATUS
2470  012520  000001           WATE3:  WAIT                            ;WAIT FOR THE INTERRUPT
2471  012522  012737  000246  000402           MOV     #246,@#$FATAL   ;MOVE TO MAILBOX #  *******  246  *******
2472  012530  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2473  012532  000000                           HALT                    ;WAIT INSTRUCTION DID NOT LOOP
2474                                                                   ; TO SCOPE REPLACE HALT W/ 240
2475                                                                   ; AND REPLACE NEXT INST W/ 725
2476  012534  106767  000546           WATF:   MFPS    STATUS
2477  012540  005767  000542                   TST     STATUS          ;IS THE PSW CORRECT?
2478  012544  001405                           BEQ     1$
2479  012546  012737  000247  000402           MOV     #247,@#$FATAL   ;MOVE TO MAILBOX #  *******  247  *******
2480  012554  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2481  012556  000000                           HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
2482                                                                   ; TO SCOPE REPLACE HALT W/ 240
2483                                                                   ; AND REPLACE NEXT INST W/ 713
2484  012560  026727  165710  012522  1$:     CMP     BUFF-4,#WATE3+2 ;IS THE OLD PC SAVED
2485  012566  001405                           BEQ     REES
2486  012570                           REES1:
2487  012570  012737  000250  000402           MOV     #250,@#$FATAL   ;MOVE TO MAILBOX #  *******  250  *******
2488  012576  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2489  012600  000000                           HALT                    ;OLD PC WAS NOT SAVED OR WRONG $TESTN
2490                                                                   ; TO SCOPE REPLACE HALT W/ 240
2491                                                                   ; AND REPLACE NEXT INST W/ 702
2492  012602  042767  000100  164754  REES:   BIC     #100,TPS        ;CLEAR THE INTERRUPT ENABLE
2493  012610  012767  000066  165246           MOV     #66,64
```

```
 2494
 2495                                   ;*****************************************************************************
 2496                                   ;TEST 72 ,THAT ODD ADDRESSING WILL IGNORE BIT 0                              .
 2497                                   ;*****************************************************************************
 2498  012616  005237  000404          TST72:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 2499  012622  022737  000072  000404          CMP     #72,@#$TESTN    ;SEQUENCE ERROR?
 2500  012630  001002                          BNE     RSTP5           ;BR TO ERROR HALT ON SEQ ERROR
 2501  012632  000167  000013                  JMP     ODD+1
 2502  012636                          RSTP5:
 2503  012636  012737  000251  000402          MOV     #251,@#$FATAL   ;MOVE TO MAIL3OX #  *******  251  *******
 2504  012644  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 2505  012646  000000                          HALT                    ;SHOULD HAVE JUMPED,OR WRONG $TESTN
 2506                                                                  ; TO SCOPE REPLACE HALT W/ 240
 2507                                                                  ; AND REPLACE NEXT INST W/ 770
 2508  012650  005307                  ODD:    DEC     PC
```

```
2509
2510                                    ;*****************************************************************************
2511                                    ;TEST 73 THAT ALL RESERVED INSTRUCTIONS TRAP
2512                                    ;*****************************************************************************
2513  012652  005237  000404           TST73:  INC     @#$TESTN        ;UPDATE TEST NUMBER
2514  012656  022737  000073  000404          CMP     #73,@#$TESTN    ;SEQUENCE ERROR?
2515  012664  001142                          BNE     RET4            ;BR TO ERROR HALT ON SEQ ERROR
2516  012666  010267  000532                  MOV     R2,R2STOR       ; SAVE REG 2
2517  012672  010700                          MOV     PC,%0           ;SET THESE
2518  012674  010704                          MOV     PC,%4           ;REGISTERS
2519  012676  010705                          MOV     PC,%5           ;TO EXISTENT MEMORY LOCATIONS
2520  012700  012703  013222                  MOV     #TABLE,R3       ;TABLE POINTER
2521  012704  012302                  GIN1:   MOV     (R3)+,R2        ;FIRST OR CURRENT INSTRUCTION
2522  012706  012301                          MOV     (R3)+,R1        ;LAST INSTRUCTION OR GROUP
2523  012710  020267  000326                  CMP     R2,EISFIS       ;IS IT THE 'EISFIS' GROUP?
2524  012714  001020                          BNE     3$              ;NO
2525  012716  032767  000100  165476          BIT     #100,$SWREG     ;SUPPRESS EIS/FIS?
2526  012724  001004                          BNE     1$              ;BRANCH IF YES
2527  012726  032767  000300  165472          BIT     #300,$CPUOP     ;DO WE HAVE EISFIS OPTION?
2528  012734  001403                          BEQ     2$              ;BRANCH IF NOT
2529  012736  062703  000004          1$:     ADD     #4,R3           ;IF YES DO NO DO THE
2530  012742  000760                          BR      GIN1            ;EIS FIS OP CODES
2531  012744  032767  000004  165450  2$:     BIT     #4,$SWREG       ;DO WE HAVE DIS INSTRUCTION SET
2532  012752  001401                          BEQ     3$              ;NO
2533  012754  000753                          BR      GIN1            ;IF YES, DO NOT DO EIS OP CODES - DO JUST FIS
2534  012756  020267  000270          3$:     CMP     R2,STOP ;IS IT THE STOP GROUP
2535  012762  001007                          BNE     4$              ;NO
2536  012764  032767  000020  165430          BIT     #20,$SWREG      ;DO WE WANT TO DO IT?
2537  012772  001403                          BEQ     4$              ;YES
2538  012774  062703  000010                  ADD     #10,R3          ;SKIP ENTIRE STOP GROUP
2539  013000  000741                          BR      GIN1            ;NO
2540  013002  020267  000250          4$:     CMP     R2,DIS  ;IS THIS THE DIS GROUP?
2541  013006  001010                          BNE     5$              ;NO
2542  013010  032767  000040  165410          BIT     #40,$CPUOP      ;DIS PRESENT??
2543  013016  001332                          BNE     GIN1            ;BRANCH IF YES--DON'T DO DIS
2544  013020  032767  000004  165374          BIT     #4,$SWREG       ;SUPPRESS DIS OPTION?
2545  013026  001326                          BNE     GIN1            ;BRANCH IF YES, SKIP THE DIS GROUP
2546  013030  020267  000232          5$:     CMP     R2,STOP1        ;IS IT THE STOP1 GROUP?
2547  013034  001005                          BNE     6$              ;NO
2548  013036  032767  000010  165356          BIT     #10,$SWREG      ;DO WE WANT TO DO IT?
2549  013044  001401                          BEQ     6$              ;YES
2550  013046  000716                          BR      GIN1            ;NO
2551  013050  020267  000216          6$:     CMP     R2,FINISH       ;TESTED ALL
2552  013054  001524                          BEQ     GIN3            ;BRANCH IF YES, GO TO END OF PASS ROUTINE
2553  013056  010267  000212                  MOV     R2,INST ;SET UP INST
2554  013062  005267  000206          GIN2:   INC     INST
2555  013066  012767  013112  164714          MOV     #RET,10         ;SET UP RETURN FROM TRAP
2556  013074  012706  000500                  MOV     #BUFF,SP        ;SET UP STACK POINTER
2557  013100  005067  000202                  CLR     STATUS          ;CLEAR PRIORITY
2558  013104  106467  000176                  MTPS    STATUS
2559  013110  000471                          BR      INST            ;EXECUTE RESERVED INSTRUCTION
2560
2561                                    ;TRAPPING SHOULD SEND YOU HERE
2562  013112  010267  000102          RET:    MOV     R2,R2SAVE       ; SAVE REG 2
2563  013116  016702  000302                  MOV     R2STOR,R2       ; RESTORE MAILBOX POINTER
2564  013122  020627  000474                  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
```

```
2565  013126  001405                        BEQ     RET1
2566  013130  012737  000252  000402        MOV     #252,@#$FATAL   ;MOVE TO MAILBOX #  *******  252  *******
2567  013136  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2568  013140  000000                        HALT                    ;WRONG DECREMENT
2569                                                                 ; TO SCOPE REPLACE HALT W/ 240
2570                                                                 ; AND REPLACE NEXT INST W/ 651
2571  013142  026727  165326  013276  RET1: CMP     BUFF-4,#INST+2  ;LOC OF INST UNINCREMENTED
2572  013150  001405                        BEQ     RET2
2573  013152  012737  000253  000402        MOV     #253,@#$FATAL   ;MOVE TO MAILBOX #  *******  253  *******
2574  013160  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2575  013162  000000                        HALT                    ;INST INC ON TRAP
2576                                                                 ; TO SCOPE REPLACE HALT W/ 240
2577                                                                 ; AND REPLACE NEXT INST W/ 640
2578  013164  005767  165306        RET2:   TST     BUFF-2
2579  013170  001405                        BEQ     RET3
2580  013172                         RET4:
2581  013172  012737  000254  000402        MOV     #254,@#$FATAL   ;MOVE TO MAILBOX #  *******  254  *******
2582  013200  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2583  013202  000000                        HALT                    ;CONDITION CODES SET ON TRAP,OR WRONG $TESTN
2584                                                                 ; TO SCOPE REPLACE HALT W/ 240
2585                                                                 ; AND REPLACE NEXT INST W/ 630
2586  013204  016702  000010        RET3:   MOV     R2SAVE,R2       ; RESTORE REG 2
2587  013210  026701  000060                CMP     INST,R1
2588  013214  001633                        BEQ     GIN1            ;SET UP NEW GROUP
2589  013216  000721                        BR      GIN2            ;FINISH OLD GROUP
2590  013220  000000                R2SAVE: .WORD   0
2591                                                                 ;END OF INSTRUCTION GROUP
2592  013222  000006                TABLE:  6
2593  013224  000077                        77
2594
2595  013226  106477                        106477
2596  013230  106677                        106677
2597
2598  013232  006777                        6777
2599  013234  007777                        7777
2600  013236  106777                        106777
2601  013240  107777                        107777
2602  013242  067777                EISFIS: 67777   ;IF WE HAVE THE EIS FIS OPTION
2603  013244  073777                        73777   ;THEN THE EISFIS GROUP
2604  013246  074777                FIS:    74777   ;WILL BE SKIPED
2605  013250  075037                        75037
2606  013252  075377                STOP:   75377
2607  013254  076027                        76027
2608  013256  076027                DIS:    76027
2609  013260  076057                        76057
2610  013262  076057                        76057
2611  013264  076777                        76777
2612  013266  167777                STOP1:  167777
2613  013270  177777                        177777
2614  013272  013272                FINISH: .                       ;END FLAG
2615  013274  000000                INST:   HALT                    ;WILL CONTINUE RESERVED INST
2616  013276  000404                        BR      TERR
2617  013300  000403                        BR      TERR
2618  013302  000402                        BR      TERR
2619  013304  000401                        BR      TERR
2620  013306  000000                STATUS: 0
```

```
2621  013310  016702  000110          TERR:   MOV     R2STOR,R2       ; RESTORE R2
2622  013314  012737  000255  000402          MOV     #255,@#$FATAL   ; INDICATE ERROR
2623  013322  005212                          INC     (R2)
2624  013324  000000                          HALT
2625
2626
2627  013326  005237  000406          GIN3:   INC     @#$PASS
2628  013332  005267  000070                  INC     PASSPT          ;SHOULD PRINT THIS PASS?
2629  013336  001013                          BNE     ACT             ;NO
2630  013340  032767  000040  165054          BIT     #40,$SWREG      ;TYPE END OF PASS?
2631  013346  001004                          BNE     1$              ;BRANCH IF NOT
2632  013350  004567  000276                  JSR     R5,TYPE
2633  013354  013766                            EOPMSG
2634  013356  000005                          RESET
2635  013360  012767  177761  000040  1$:     MOV     #177761,PASSPT  ;DO IT 1ST DECIMAL TIMES
2636  013366  013700  000042          ACT:    MOV     @#42,R0         ;CHECK ACT
2637  013372  001405                          BEQ     GOAGIN          ;KEEP GOING
2638  013374  000005                          RESET
2639  013376  004710                  $ENDAD: JSR     PC,(R0)         ;ACT HOOKS
2640  013400  000240                          NOP
2641  013402  000240                          NOP
2642  013404  000240                          NOP
2643  013406  012767  000012  164374  GOAGIN: MOV     #12,10
2644  013414  005067  164372                  CLR     12
2645  013420  000167  165130                  JMP     RESTRT          ;DO NEXT PASS
2646  013424  000000                  R2STOR: .WORD   0
2647  013426  177777                  PASSPT: -1
```

```
                                ;*****************************************************************************
                                ;SIZE ROUTINE
                                ;*****************************************************************************

013430  010246          SIZE:   MOV     R2,-(SP)        ;SAVE R2
013432  010446                  MOV     R4,-(SP)        ;SAVE R4
013434  004567  000212          JSR     R5,TYPE         ;TYPE 'EIS/FIS OPTION ''
013440  014062                    FISOPT
013442  012702  013652          MOV     #FSTACK,R2      ;SET UP FLOATING POINT STACK
013446  005042                  CLR     -(R2)
013450  005042                  CLR     -(R2)
013452  005042                  CLR     -(R2)
013454  005042                  CLR     -(R2)
013456  012737  013504  000010  MOV     #1$,@#10        ;SET UP RESERVED INSTRUCTION VECTOR
013464  075002                  FADD    R2              ;EXECUTE FLOATING INSTR (0+0)
013466  012737  000012  000010  MOV     #12,@#10        ;RESTORE VECTOR
013474  052767  000300  164724  BIS     #300,$CPUOP     ;FLAG OPTION PRESENT
013502  000413                  BR      2$
                        ;TRAP TO HERE IF NO FIS
013504  012737  000012  000010  1$:     MOV     #12,@#10        ;RESTORE VECTOR
013512  062706  000004          ADD     #4,SP           ;POP TRAP PC/PSW OFF STACK
013516  042767  000300  164702  BIC     #300,$CPUOP     ;FLAG OPTION NOT PRESENT
013524  004567  000122          JSR     R5,TYPE         ;TYPE 'NOT ''
013530  014104                    NOT
013532  004567  000114          2$:     JSR     R5,TYPE         ;TYPE 'PRESENT<CR>''
013536  014111                    PRESENT

013540  004567  000106          JSR     R5,TYPE         ;TYPE 'DIBOL INSTRUCTION SET ''
013544  014123                    DISOPT
013546  005002                  CLR     R2              ;SET UP A 0 DEST LENGTH
013550  005004                  CLR     R4              ;HIGH BYTE MUST BE CLEAR
013552  012737  013600  000010  MOV     #3$,@#10        ;SET UP TRAP VECTOR
013560  076030                  MOVC                    ;MOVE CHARACTER INSTRUCTION
013562  012737  000012  000010  MOV     #12,@#10        ;RESTORE VECTOR
013570  052767  000040  164630  BIS     #40,$CPUOP      ;FLAG OPTION PRESENT
013576  000413                  BR      4$
                        ;TRAP HERE IF NO DIS
013600  012737  000012  000010  3$:     MOV     #12,@#10        ;RESTORE VECTOR
013606  042767  000040  164612  BIC     #40,$CPUOP      ;FLAG NO OPTION
013614  062706  000004          ADD     #4,SP           ;POP TRAP PC/PSW OFF STACK
013620  004567  000026          JSR     R5,TYPE         ;TYPE 'NOT ''
013624  014104                    NOT
013626  004567  000020          4$:     JSR     R5,TYPE         ;'PRESENT<CR>''
013632  014111                    PRESENT

013634  012604                  MOV     (SP)+,R4        ;RESTORE REGISTERS USED
013636  012602                  MOV     (SP)+,R2
013640  000207                  RTS     PC

                        ;FLOATING POINT STACK FOR FIS
013642  000004                  .BLKW   4
013652                  FSTACK:
```

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                                        ;*****************************************************************************
                                        ;TYPE ROUTINE
                                        ;*****************************************************************************

013652  010046                  TYPE:   MOV     R0,-(SP)        ;SAVE REGISTER
013654  012500                          MOV     (R5)+,R0        ;GET TEXT POINTER
013656  132767  000040  164535          BITB    #40,$ENVM       ;SUPPRESS OUTPUT??
013664  001011                          BNE     3$              ;BRANCH IF YES--RETURN
013666  105737  177564          1$:     TSTB    @#TPS           ;WAIT FOR TTY READY
013672  100375                          BPL     1$
013674  112037  177566                  MOVB    (R0)+,@#TPB     ;TYPE CHARACTER
013700  001372                          BNE     1$              ;BRANCH IF IT WAS NOT TERMINATOR
013702  105737  177564          2$:     TSTB    @#TPS           ;WAIT FOR READY
013706  100375                          BPL     2$
013710  012600                  3$:     MOV     (SP)+,R0        ;RESTORE REGISTER
013712  000205                          RTS     R5

                                        ;*********************************
                                        ;POWER FAIL ROUTINE
                                        ;*********************************

013714  012767  013724  164102  PWRDWN: MOV     #PWRUP,24
013722  000000                          HALT

013724  012767  013714  164072  PWRUP:  MOV     #PWRDWN,24
013732  012706  000500                  MOV     #BUFF,SP
013736  005000                          CLR     R0              ;SET UP A DELAY
013740  012701  177750                  MOV     #-30,R1
013744  005200                  1$:     INC     R0
013746  001376                          BNE     1$
013750  005201                          INC     R1
013752  001374                          BNE     1$
013754  004567  177672                  JSR     R5,TYPE         ;TYPE POWER FAIL MESSAGE
013760  014004                            MSGPWF
013762  000167  164514                  JMP     START

013766  005015  047105  020104  EOPMSG: .ASCIZ  <15><12>.END OF PASS.
013774  043117  050040  051501
014002  000123
014004  005015  047520  042527  MSGPWF: .ASCIZ  <15><12>.POWER FAILED!.
014012  020122  040506  046111
014020  042105  000041
014024  005015  053103  040513  TITLE:  .ASCIZ  <15><12>.CVKADC0 LSI-11 TRAPS TEST.<15><12>
014032  041504  020060  051514
014040  026511  030461  052040
014046  040522  051520  052040
014054  051505  006524  000012
014062  005015  044505  027523  FISOPT: .ASCIZ  <15><12>.EIS/FIS OPTION .
014070  044506  020123  050117
014076  044524  047117  000040
014104  047516  020124     000  NOT:    .ASCIZ  .NOT .
014111     120  042522  042523  PRESENT: .ASCIZ .PRESENT.<15><12>
014116  052116  005015     000
014123     104  041111  046117  DISOPT. .ASCIZ  .DIBOL INSTRUCTION SET .
014130  044440  051516  051124
014136  041525  044524  047117
```

```
 2757  014144  051440  052105  000040
 2758          000001                          .END
```

```
ABASE - 000000            280
ACDW1 = 000000            280
ACDW2 = 000000            280
ACPUOP= 000000            280     295
ACT     013366           2629    2636#
ADDW0 = 000000            280
ADDW1 = 000000            280
ADDW10= 000000            280
ADDW11= 000000            280
ADDW12= 000000            280
ADDW13= 000000            280
ADDW14= 000000            280
ADDW15= 000000            280
ADDW2 = 000000            280
ADDW3 = 000000            280
ADDW4 = 000000            280
ADDW5 = 000000            280
ADDW6 = 000000            280
ADDW7 = 000000            280
ADDW8 = 000000            280
ADDW9 = 000000            280
ADEVCT= 000000            280     286
ADEVM = 000000            280
AENV  = 000000            280     291
AENVM = 000000            280     292
AFATAL= 000000            280     283
AMADR1= 000000            280     308
AMADR2= 000000            280     312
AMADR3= 000000            280     315
AMADR4- 000000            280     318
AMAMS1= 000000            280     302
AMAMS2= 000000            280     310
AMAMS3= 000000            280     313
AMAMS4= 000000            280     316
AMSGAD= 000000            280     288
AMSGLG= 000000            280     289
AMSGTY= 000000            280     282
AMTYP1= 000000            280     303
AMTYP2= 000000            280     311
AMTYP3= 000000            280     314
AMTYP4= 000000            280     317
APASS = 000000            280     285
APRIOR= 000000            280
ASWREG= 000000            280     293
ATESTN= 000000            280     284
ATRAP   012222           2369    2402#
AUNIT = 000000            280     287
AUSWR = 000000            280     294
AUTO1   012350           2360    2438#
AVECT1= 000000            280
AVECT2= 000000            280
BEGIN   000546            361     365#
BELL  = 000240            255#
BTRAP   012304           2410    2426#
BUFF    000500            351#     354     690     705     708     722     725     738     744     751     757     771     811
                          863      878     881     894     897     911     917     924     929     943     983    1034    1053
```

```
                        1068    1071    1085    1088    1101    1107    1114    1120    1134    1174    1226    1241    1244
                        1257    1260    1274    1280    1287    1293    1307    1347    1398    1417    1433    1436    1449
                        1452    1466    1472    1479    1485    1499    1539    1598    1613    1616    1630    1633    1646
                        1652    1659    1665    1679    1719    1767    1782    1785    1799    1802    1816    1822    1829
                        1835    1849    1889    1940    1958    1969    1983    1989    2005    2028    2059    2089    2120
                        2132    2145    2174    2213    2271    2303    2326    2370    2394    2411    2434    2436    2458
                        2484    2556    2564    2571    2578    2726
CORH    012266          2375*   2403*   2416#
CTRAP   012240          2408#   2435    2437
DIS     013256          2540    2608#
DISOPT  014123          2677    2754#
DTRAP1  012260          2413#   2434
DTRAP2  012262          2414#   2436
EISFIS  013242          2523    2602#
EMT   = 104000           243#   1396
EOPMSG  013766          2633    2737#
FINISH  013272          2551    2614#
FIS     013246          2604#
FISOPT  014062          2656    2748#
FSTACK  013652          2657    2700#
GIN1    012704          2521#   2530    2533    2539    2543    2545    2550    2588
GIN2    013062          2554#   2589
GIN3    013326          2552    2627#
GOAGIN  013406          2637    2643#
HERE    000624           381#    390*    400*    464
HICORE  012116          2363*   2366*   2373#   2375    2405
HLT   = 000000           241#
ILLA  = 004700           259#
ILLB  = 000100           260#
INST    013274          2553*   2554*   2559    2571    2587    2615#
INSTC   002252           724#
INSTK   007252          1801#   1802
ITRAPS= 000004           245#
K1      000600           371#    480*    481     484     493*    494     497     505*    507     518*    520     531*    533
                         536
K10     000616           378#    566     575     582     590     598     606
K11     000620           379#
K12     000622           380#
K2      000602           372#
K3      000604           373#
K4      000606           374#
K5      000610           375#    479*    482     492*    506*    508     510     519*    521     523     532*    534
K6      000612           376#    495     575
K7      000614           377#    550     558     566     582     606
MOVC  = 076030          2681#
MSGPWF  014004          2734    2740#
NOAPT   011030          2168    2171#
NOAPT1  011214          2208    2211#
NOAPT2  011616          2296    2299#
NOAPT3  012426          2454    2457#
NOP   = 000240           256#
NOR     012112          2371#   2374
NOSUB   012244          2407    2410#
NOT     014104          2672    2690    2751#
ODD     012650          2501    2508#
PASSPT  013426           365*   2628*   2635*   2647#
```

```
PRESEN  014111            2674    2692    2752#
PWRDWN  013714             352    2722#   2725
PWRUP   013724            2722    2725#
RA      005412            1397    1406#
RA1     003636            1033    1042#
RB      005376            1396*   1399#   1406*   1407
RBBB    005400            1395    1400#
RB1     003622            1032*   1035#   1042*   1043
RB1AA   003624            1031    1036#
RC      005372            1398#   1408
RC1     003616            1034#   1044
REES    012602            2456    2485    2492#
REES1   012570            2452    2486#
RESET2  011542            2272    2284#
RESTRT  000554             366#   2645
RET     013112            2555    2562#
RETA    002154             691     698#
RETAT   010014            1941    1951#
RETA1   003010             864     871#
RETA2   003726            1054    1061#
RETA3   004562            1227    1234#
RETA4   005502            1418    1425#
RETA5   006336            1599    1606#
RETB    002204             706     708#
RETBT   010070            1959    1969#
RETB1   003040             879     881#
RETB2   003756            1069    1071#
RETB3   004612            1242    1244#
RETB4   005532            1434    1436#
RETB5   006366            1614    1616#
RETC    002254             723     725#
RETCT   010150            1984    1989#
RETC1   003110             895     897#
RETC2   004026            1086    1088#
RETC3   004662            1258    1260#
RETC4   005602            1450    1452#
RETC5   006436            1631    1633#
RETD    002340             739     744#
RETD1   003174             912     917#
RETD2   004112            1102    1107#
RETD3   004746            1275    1280#
RETD4   005666            1467    1472#
RETD5   006522            1647    1652#
RETE    002412             752     757#
RETE1   003244             925     929#
RETE2   004164            1115    1120#
RETE3   005020            1288    1293#
RETE4   005740            1480    1485#
RETE5   006574            1660    1665#
RETF    002470             772     775#
RETF1   003322             944     947#
RETF2   004242            1135    1138#
RETF3   005076            1308    1311#
RETF4   006016            1500    1503#
RETF5   006652            1680    1683#
RETG    002620             812     815#
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RETG1   003452            984     987#
RETG2   004372           1175    1178#
RETG3   005226           1348    1351#
RETG4   006146           1540    1543#
RETG5   007002           1720    1723#
RETH5   007154           1768    1775#
RETJ    007204           1783    1785#
RETK    007254           1800    1802#
RETL    007340           1817    1822#
RETM    007412           1830    1835#
RETN    007470           1850    1853#
RETO    007616           1890    1893#
RET1    013142           2565    2571#
RET2    013164           2572    2578#
RET3    013204           2579    2586#
RET4    013172           2515    2580#
RSTP1   002722            770     848#
RSTP2   006250           1498    1576#
RSTP3   011530           2270    2278#
RSTP4   012006           2294    2336#
RSTP5   012636           2500    2502#
RST1    002734            847     854#
RST2    006262           1575    1582#
RST4    012020           2335    2342#
RTI1    010424           2061    2065#
RTI2    010440           2062    2071#
RTRAP =  000010            258#    691*    706*    723*    739*    752*    772*    773*    812*    813*
RTRAP1=  000034            250#    864*    879*    895*    912*    925*    944*    945*    984*    985*
RTRAP2=  000020            249#   1054*   1069*   1086*   1102*   1115*   1135*   1136*   1175*   1176*
RTRAP3=  000030            248#   1227*   1242*   1258*   1275*   1288*   1308*   1309*   1348*   1349*
RTRAP4=  000014            247#   1418*   1434*   1450*   1467*   1480*   1500*   1501*   1540*   1541*   1941*   1959*   1984*
RTRAP5=  000004            246#   1599*   1614*   1631*   1647*   1660*   1680*   1681*   1720*   1721*   1768*   1783*   1800*
                          1817*   1830*   1850*   1851*   1890*   1891*
RTT1    010234           2008    2011#
RTT2    010252           2009    2019#
RTT3    010320           2030    2034#
RTT4    010340           2031    2042#
RTT5    010272           2028#   2036    2045
RTT6    010362           2043    2051#
ROTRAP  012154           2376    2386#
R2SAVE  013220           2562*   2586    2590#
R2STOR  013424           2516*   2563    2621    2646#
R6TST   000642            389#
SIZE    013430            362    2653#
START   000502            346     349     352#   2735
STATUS  013306            621*    622*    652*    653*    654*    740*    741*    753*    754*    803*    804     843*    84?
                          913*    914*    926*    927*    975*    976    1015*   1016    1103*   1104*   1116*   1117*   1166*
                         1167    1206*   1207    1276*   1277*   1289*   1290*   1339*   1340    1379*   1380    1468*   1469*
                         1481*   1482*   1531*   1532    1571*   1572    1648*   1649*   1661*   1662*   1711*   1712    1751*
                         1752    1818*   1819*   1831*   1832*   1881*   1882    1921*   1922    2175*   2176*   2184*   2185*
                         2214*   2215*   2284*   2285*   2315*   2316    2333*   2334    2386*   2387    2426*   2427    2468*
                         2469*   2476*   2477    2557*   2558*   2620#
STOP    013252           2534    2606#
STOP1   013266           2546    2612#
STP     004474           1133    1211#
STPA    004506           1210    1217#
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STPBB   007726            1924    1931#
STP1    007714            1848    1925#
TABLE   013222            2520    2592#
TERR    013310            2616    2617    2618    2619    2621#
TITLE   014024             359    2743#
TONT1   010572            2093    2111#
TPB   = 177566             254#   2463*   2466*   2711*
TPS   = 177564             253#    355    2172    2457*   2461    2464    2467*   2492*   2709    2713
TRACE   010560            2085    2105#
TRACE1  010554            2090    2103#
TRAP  = 104400             242#   1032
TRAPA = 000007             257#    692     707     724     743     756     774     814
TRAPB   012362            2395    2417    2444#
TRCSR = 177560             252#   2246*   2257
TRC1    010666            2121    2132#
TRC2    010750            2147    2151#
TRC3    010764            2148    2158#
TRPADR  012142            2378#   2394
TRPTRP  010476            2089#   2104
TRT   = 000003             244#   1419    1435    1451    1471    1484    1502    1542
TR0     011132            2177    2187#
TR1     011144            2166    2181    2193#
TR2     011156            2182    2199#
TR3     011306            2217    2224#
TR4     011322            2218    2231#
TR5     011310            2206    2219    2225#
TST1    000626             370     386#
TST10   002276             721     726     735#
TST11   002434             737     758     768#
TST12   002746             860#
TST13   003010             862     875#
TST14   003060             877     882     891#
TST15   003132             893     898     908#
TST16   003266             910     930     940#
TST17   003566             942    1019    1029#
TST2    001124             388     466     476#
TST20   003664            1050#
TST21   003726            1052    1065#
TST22   003776            1067    1072    1082#
TST23   004050            1084    1089    1098#
TST24   004206            1100    1121    1131#
TST25   004520            1223#
TST26   004562            1225    1238#
TST27   004632            1240    1245    1254#
TST3    001450             478     537     547#
TST30   004704            1256    1261    1271#
TST31   005042            1273    1294    1304#
TST32   005342            1306    1383    1393#
TST33   005440            1414#
TST34   005502            1416    1430#
TST35   005552            1432    1437    1446#
TST36   005624            1448    1453    1463#
TST37   005762            1465    1486    1496#
TST4    001704             549     568     607     617#
TST40   006274            1595#
TST41   006336            1597    1610#
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CROSS REFERENCE TABLE -- USER SYMBOLS


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TST43   006460            1629    1634    1643#
TST44   006616            1645    1666    1676#
TST45   007112            1678    1754    1764#
TST46   007154            1766    1779#
TST47   007224            1781    1786    1796#
TST5    002112             619     677     687#
TST50   007276            1798    1803    1813#
TST51   007434            1815    1836    1846#
TST52   007740            1937#
TST53   010014            1939    1955#
TST54   010110            1957    1970    1980#
TST55   010172            1982    1990    2001#
TST56   010252            2003    2012    2024#
TST57   010362            2026    2056#
TST6    002154             689     702#
TST60   010456            2058    2073    2083#
TST61   010606            2117#
TST62   010710            2119    2133    2142#
TST63   010776            2144    2164#
TST64   011162            2170    2204#
TST65   011354            2210    2241#
TST66   011464            2243    2258    2268#
TST67   011564            2292#
TST7    002224             704     709     719#
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TST71   012374            2450#
TST72   012616            2498#
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TTY3    011700            2304    2315#
TTY4    011774            2327    2333#
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WATE2   012466            2464#   2465
WATE3   012520            2470#   2484
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$ENDAD  013376             273    2639#
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                           539#    552     553#    560     561#    569     570#    577     578#    584     585#    592     593#
                           600     601#    608     609#    624     625#    631     632#    638     639#    645     646#    657
                           658#    664     665#    671     672#    678     679#    693     694#    710     711#    727     728#
                           746     747#    759     760#    777     778#    784     785#    791     792#    798     799#    806
                           807#    817     818#    824     825#    831     832#    838     839#    849     850#    866     867#
                           883     884#    899     900#    919     920#    931     932#    949     950#    956     957#    963
                           964#    970     971#    978     979#    989     990#    996     997#   1003    1004#   1010    1011#
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                          1263#   1282    1283#   1295    1296#   1313    1314#   1320    1321#   1327    1328#   1334    1335#
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                    1402#   1420    1421#   1438    1439#   1454    1455#   1474    1475#   1487    1488#   1505    1506#
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                    1726#   1732    1733#   1739    1740#   1746    1747#   1755    1756#   1770    1771#   1787    1788#
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                    1946    1947#   1964    1965#   1971    1972#   1991    1992#   2013    2014#   2037    2038#   2046
                    2047#   2066    2067#   2074    2075#   2098    2099#   2106    2107#   2127    2128#   2134    2135#
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                    2280#   2310    2311#   2318    2319#   2337    2338#   2379    2380#   2389    2390#   2396    2397#
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                     645*    657*    664*    671*    678*    693*    710*    727*    746*    759*    777*    784*    791*
                     798*    806*    817*    824*    831*    838*    849*    866*    883*    899*    919*    931*    949*
                     956*    963*    970*    978*    989*    996*    1003*   1010*   1020*   1037*   1056*   1073*   1090*
                    1109*   1122*   1140*   1147*   1154*   1161*   1169*   1180*   1187*   1194*   1201*   1212*   1229*
                    1246*   1262*   1282*   1295*   1313*   1320*   1327*   1334*   1342*   1353*   1360*   1367*   1374*
                    1384*   1401*   1420*   1438*   1454*   1474*   1487*   1505*   1512*   1519*   1526*   1534*   1545*
                    1552*   1559*   1566*   1577*   1601*   1618*   1635*   1654*   1667*   1685*   1692*   1699*   1706*
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                    2037*   2046*   2066*   2074*   2098*   2106*   2127*   2134*   2152*   2188*   2194*   2226*   2252*
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$MAMS1   000430      302#
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                    908*  909   940*  941   1029* 1030  1050* 1051  1065* 1066  1082* 1083  1098*
                   1099  1131* 1132  1223* 1224  1238* 1239  1254* 1255  1271* 1272  1304* 1305
                   1393* 1394  1414* 1415  1430* 1431  1446* 1447  1463* 1464  1496* 1497  1595*
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                   1796* 1797  1813* 1814  1846* 1847  1937* 1938  1955* 1956  1980* 1981  2001*
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                    771#  857   863#  872   878#  882   888   894#  898   905   911#  930   937
                    943#  1019  1026  1032# 1047  1053# 1062  1068# 1072  1079  1085# 1089  1095
                   1101#  1121  1128  1134# 1220  1226# 1235  1241# 1245  1251  1257# 1261  1268
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                   1630#  1634  1640  1646# 1666  1673  1679# 1754  1761  1767# 1776  1782# 1786
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                   1977   1983# 1990  1998  2004# 2012  2021  2027# 2053  2059# 2073  2080  2086#
                   2114   2120# 2133  2139  2145# 2161  2167# 2201  2207# 2238  2244# 2258  2265
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                    634   641   648   660   667   674   681   690#  696   705#  713   722#  730
                    738#  749   762   771#  780   787   794   801   809   820   827   834   841
                    852   863#  869   878#  886   894#  902   911#  922   934   943#  952   959
                    966   973   981   992   999   1006  1013  1023  1032# 1040  1053# 1059  1068#
                   1076  1085# 1093  1101# 1112  1125  1134# 1143  1150  1157  1164  1172  1183
                   1190  1197  1204  1215  1226# 1232  1241# 1249  1257# 1265  1274# 1285  1298
                   1307# 1316  1323  1330  1337  1345  1356  1363  1370  1377  1387  1396# 1404
                   1417# 1423  1433# 1441  1449# 1457  1466# 1477  1490  1499# 1508  1515  1522
                   1529  1537  1548  1555  1562  1569  1580  1598# 1604  1613# 1621  1630# 1638
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                   1758  1767# 1773  1782# 1790  1799# 1807  1816# 1827  1840  1849# 1858  1865
                   1872  1879  1887  1898  1905  1912  1919  1929  1940# 1949  1958# 1967  1974
                   1983# 1994  2004# 2016  2027# 2040  2049  2059# 2069  2077  2086# 2101  2109
                   2120# 2130  2137  2145# 2155  2167# 2191  2197  2207# 2229  2244# 2255  2262
                   2271# 2282  2295# 2313  2321  2340  2361# 2382  2392  2399  2421  2432  2442
                   2453# 2474  2482  2490  2501# 2506  2516# 2569  2576  2584
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                    667#  674#  681#  696#  713#  730#  749#  762#  780#  787#  794#  801#  809#
                    820#  827#  834#  841#  852#  869#  886#  902#  922#  934#  952#  959#  966#
                    973#  981#  992#  999#  1006# 1013# 1023# 1040# 1059# 1076# 1093# 1112# 1125#
                   1143# 1150# 1157# 1164# 1172# 1183# 1190# 1197# 1204# 1215# 1232# 1249# 1265#
                   1285# 1298# 1316# 1323# 1330# 1337# 1345# 1356# 1363# 1370# 1377# 1387# 1404#
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                   1735# 1742# 1749# 1758# 1773# 1790# 1807# 1827# 1840# 1858# 1865# 1872# 1879#
                   1887# 1898# 1905# 1912# 1919# 1929# 1949# 1967# 1974# 1994# 2016# 2040# 2049#
                   2069# 2077# 2101# 2109# 2130# 2137# 2155# 2191# 2197# 2229# 2255# 2262# 2282#
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                 667#   674#   681#   696#   713#   730#   749#   762#   780#   787#   794#   801#   809#
                 820#   827#   834#   841#   852#   869#   886#   902#   922#   934#   952#   959#   966#
                 973#   981#   992#   999#  1006#  1013#  1023#  1040#  1059#  1076#  1093#  1112#  1125#
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                1285#  1298#  1316#  1323#  1330#  1337#  1345#  1356#  1363#  1370#  1377#  1387#  1404#
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                1735#  1742#  1749#  1758#  1773#  1790#  1807#  1827#  1840#  1858#  1865#  1872#  1879#
                1887#  1898#  1905#  1912#  1919#  1929#  1949#  1967#  1974#  1994#  2016#  2040#  2049#
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                2313#  2321#  2340#  2382#  2392#  2399#  2421#  2432#  2442#  2474#  2482#  2490#  2506#
                2569#  2576#  2584#
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                 528    541    550    555    563    572    580    587    595    603    611    620    627
                 634    641    648    660    667    674    681    690    696    705    713    722    725
                 730    738    749    762    771    780    787    794    801    809    820    827    834
                 841    852    863    869    878    886    894    897    902    911    922    934    943
                 952    959    966    973    981    992    999   1006   1013   1023   1032   1040   1053
                1059   1068   1076   1085   1088   1093   1101   1112   1125   1134   1143   1150   1157
                1164   1172   1183   1190   1197   1204   1215   1226   1232   1241   1249   1257   1260
                1265   1274   1285   1298   1307   1316   1323   1330   1337   1345   1356   1363   1370
                1377   1387   1396   1404   1417   1423   1433   1441   1449   1452   1457   1466   1477
                1490   1499   1508   1515   1522   1529•  1537   1548   1555   1562   1569   1580   1598
                1604   1613   1621   1630   1633   1638   1646   1657   1670   1679   1688   1695   1702
                1709   1717   1728   1735   1742   1749   1758   1767   1773   1782   1790   1799   1807
                1816   1827   1840   1849   1858   1865   1872   1879   1887   1898   1905   1912   1919
                1929   1940   1943   1949   1958   1961   1967   1974   1983   1986   1989   1994   2004
                2016   2027   2040   2049   2059   2069   2077   2086   2095   2101   2109   2120   2124
                2130   2137   2145   2155   2167   2173   2180   2191   2197   2207   2222   2229   2244
                2249   2255   2262   2271   2274   2282   2295   2302   2309   2313   2321   2325   2332
                2340   2361   2382   2392   2399   2421   2432   2442   2453   2474   2482   2490   2501
                2506   2516   2569   2576   2584   2614   2699#
.$X   - 000450   326#   331
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	1952	1954	1977	1979	1998	2000	2021	2023	2053	2055	2080	2082	2114	2116	2139
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$$N      234#    383     473     544     614     684     699     716     732     765     857     872     888     905     937
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.$ACT1   264#    267
.$APTB   264#    277
.$APTH   264#    321


. ABS.  014152     000


 ERRORS DETECTED:  0

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 RUN-TIME RATIO: 126/30=4.1
 CORE USED:  10K  ( 9 PAGES)
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